



## **GE LightSpeed QX/i**

The Light Speed QX/I CT Scanner System is a Whole Body Multi-Slice Helical Computed Tomography Scanner capable of routine 0.8-second full 360 degree rotation scans, while acquiring multiple slices in a single scan rotation. The system is designed to produce optimum image quality with fully simultaneous scan, image reconstruction, filming, archiving, networking and display. This scanner was made possible by design for Six Sigma Methodology.

LightSpeed QX/I represents a revolution in medical imaging, providing high gains in productivity and growing clinical applications.

### **Primary Features:**

- Volume Acquisitions at up to 7.5 images per second
- Routine use to thin slices without compromise in IQ, coverage or throughput
- Full organ coverage in Arterial Phase
- Longer helical scans with no tube cooling
- Longer tube life
- Potential for reduced contrast usage

Users have shown that these key features yield several key benefits including:

- Reduction in body scan times from 3 minutes or more to 20 seconds. Saving time that can be critical, especially in trauma situations
- Routine use of thinner slices, with exceptional image quality, enabling for CT applications. The LightSpeed QX/I takes advantage of over 10 years of GE HiLight detector production to provide this radical new design while maintaining reliability and manufacturability.

### **Gantry**

The gantry's advanced slip ring design continuously rotates generator, tube, detector and data acquisition system around the patient

- Aperture: 70 cm
- Tilt: +/- 30 degrees
- Maximum SFOV: 50 cm
- Rotational Speeds: 360 degrees in 0.8, 1.0, 2.0, 3.0 and 4.0 seconds

- Biopsy and Interventional studies have been facilitated through a more streamlined gantry shroud and bilateral table/gantry controls and gantry display that maximize maneuverability while working next to the gantry
- Laser alignment lights brightly illuminate the scan plane
- Visual readout is easy to read from the table side or from the operator console
- Gantry tilt controls are located on the side of the gantry

### **Performix ADV X-ray Tube**

The Performix ADV Tube with 6.3 MHU of storage and 53.2kw operation provides increased helical performance with greater patient throughput and virtually no tube cooling. Advanced technology in the performix adv tube includes a metal-ceramic frame for long life. High speed bearing for sub-second scanning, a high-efficiency motor to accelerate the large anode, and efficient cooling for high throughput.

### **Performance**

The performance ADV metal-ceramic tube unit is specifically optimized for exams requiring a large number of scans without tube cooling

- Heat Storage Capacity: 6.3 MHU
- Heat dissipation:
  - Anode (max) 840 KHU/minutes
  - Casing (cont.) 300 KHU/minutes
  - Tube unit: 6.9kW continuous for 10 minutes

### **High Precision, High Voltage Generator**

The high precision design of the lightspeed QX/I generator provides the user with the ability to tailor scan parameters to accommodate all patients sizes, densities, exam protocols. The result of this precision engineering is consistent image quality across a broad range of clinical procedures

- 53kw high frequency onboard generator of continuous on x-ray
- Wide range of technique factors (10mA to 440mA, in 10mA increments) gives operator and physician flexibility to tailor technique to specific needs. optimizing patient dose, and providing the power needed to perform a broad spectrum of axial and helical examinations
- Scan Time of 0.8, 1, 2, 3, and 4 seconds full rotation provide the flexibility tailor scan protocols for optimum image quality

### **Patient Table**

The LightSpeed QX/I patient table is designed to provide control and reliability including the longest scannable range in the industry.

- Single wide table with cantilever design also provides wide height range.
- Vertical range: 51 cm to 107 cm
- Vertical scannable range: 88cm to 107cm

- Elevation speeds: 5 mm/sec and 40 mm/sec
- Horizontal range: 170 cm
- Horizontal scannable range: 170 cm
- Metal free
  - Horizontal speed: up to 100 mm/seconds
  - Table automatically re-centers on Scan plane with changes in vertical position

**Load Capacity:**

- 180 kg (400 lb.) with +/- 0.25 mm positional accuracy
- 205 kg (450 lb.) maximum allowed with normal operation and +/- mm positional accuracy

Controls on gantry are Easy to reach for elevation and cradle incrementation. Foot pedals on both sides of table provide fast elevation. Cradle position controlled from OC for prescribed Scans.

**Computer System**

The LightSpeed QX/I supplies exceptional computer and image processing power that significantly enhances clinical productivity. Building upon the strength of the HiSpeed CT/i - - true interactive CT technology.

The LightSpeed QX/I utilizes a silicon graphics, inc. Octane computer, with a solid impact texture memory and a GE-Proprietary image generator. The solid impact graphics engine uses 4 MB of texture memory and provides up to 60 million trilinear interpolations per second.

Silicon Graphics, Inc. octane workstation computer with impact graphics engine.

- GE-Proprietary image generator
- 2.3 GB MOD drive
- CD-ROM drive

The lightspeed QX/I Computer, image processor, peripherale, image reconstruction hardware and camera interface are completely integrated into the base of the console for ease in sitting and comfortable operator access to image archive drives

**The LightSpeed QX/I Operator Console Features**

- Two 20-inch monitors, each monitor provides a 1280 x 1024 high resolution, flicker-free display
- Scan control keyboard assembly with intercom speaker, microphone and volume controls
- Three button mouse with mouse pad
- Brightbox (Trackball Assembly)

- Two wide work surfaces

All three devices are free-standing and can be easily moved to accommodate a large variety of working conditions and individual operator preferences.

Split table top allows unrestricted patient viewing while still supporting 2 large monitors. Each work surface can be adjusted at installation to help accommodate a variety of sitting requirements.

### **Human Interface**

The LightSpeed QX/I has a human interface which is so intuitive as to become purely natural – from the screens to the console hardware itself. This user generated design ensures:

- Operation with a very high degree of automation. Yet allow patient-specific changes to be easily made, with virtually no restrictions.
- As self-teaching as possible, and have on-line access to tutorials as needed
- A large screen interface for controlling scan acquisition easily, with virtually everything at a single glance
- Completely protocol-driven scan control with only two screens to complete patient set up
- Highly flexible editing tools that allow easy tailoring of the exam to the patient
- Two large, 1024 color display

### **SmartTools Productivity Software**

The LightSpeed QX/I ct scanner includes SmartTools software designed to increase CT productivity 30-50 % by automating every step of the complete exam. This allows the user to focus on the providing better patient care while the LightSpeed performs all of the tasks necessary to complete an exam including multiple scan series, multiple reconstructions, multiple films, smartslice image decompositions, image archiving and image networking.

- Multiple scan series: each protocol includes all of the scans needed to complete the exam, including axials, helicals, both, AutoVoice, AutoArchive, AutoFilm, and electronic \*link to HIS/RIS for patient scheduling, demographics and protocol information (\*Optional)
- Prospective multiple reconstruction (PMR) up to 3 sets of reconstructions can be pre-programmed as part of the Scan protocol prior to the acquisition. The operator can select different reconstruction algorithms and display fields of view for each reconstruction. This frees the operator from sitting at the console and directly contributes to increased productivity.
- Prospective multiple autofilming, up to 3 automatic multiple films sets can be pre-programmed per reconstruction image. With up to 2 image filters per reconstructed image allowing the user to vary window/level and display format.
- Smartslice image decomposition, the user has the option to retrospectively decompose the original raw data set and reconstruct additional images at any of

the defined nominal image thickness available for a given table speed and scan mode. Retrospective image decomposition can generate images  $\frac{1}{2}$  the original acquisition image thickness (helical) , and  $\frac{1}{4}$  the original acquisition image thickness (axial) , depending upon the table speed and scan mode selected for the acquisition.

- Auto archiving
- Auto network transfer
- AutoVoice

### **Lightspeed QX/I protocol pro II**

Lightspeed QX/I includes thirty clinically optimized multi-slice protocols built into the scanners database that are designed to take full advantage of the power of multi-slice. This feature is designed to allow users to quickly and efficiently begin using system, and harness the true power of multi-slice scanning.

### **Lightspeed QX/I operating software**

The operating software utilizes the paradigm of managed work environments for a more intuitive clinical workflow.

Virtually all clinical operations are managed through three “virtual desktops” or application managers exam rx, image works, and Sherlock. Operators can effortlessly move back and forth between these environments simply by clicking on an icon. An enhanced multi-tasking architecture maintains all processes so no work is lost or disputed as desktops as switched.

### **Exam Rx**

- Imageworks
- Preview visualization algorithms

### **LightSpeed QX/I Scan Performance**

#### **Dicom 3.0**

#### **Advance Windows Workstation**

- U60 Platform with two flat panel monitors
- CT/MR analysis
- Volume rendering
- Additional 512 MB RAM

The advantage workstation is designed for high performance, high productivity image review and optional advanced analysis. Dicom images from multiple modalities including CT, MR, CR, X-ray Angio, X-ray R7F, and secondary capture, can easily be viewed on the station, even simultaneously.

The advantage workstation offers both power and simplicity with an intuitive user friendly interface that allows rapid review and quickaccess to images. The system was designed with powerful software functionality including:

- Region of interest (Rectangular, Ellipse, Irregular)
- Measure Distance
- Annotation, Even with replication
- Image Matte
- Pan/Zoom
- Image Orientation Flip and Rotate
- Window/Level via the Function Keys, Mouse or Hardkey arrows
- Screen formats of 1:1-4:5, plus user customizable