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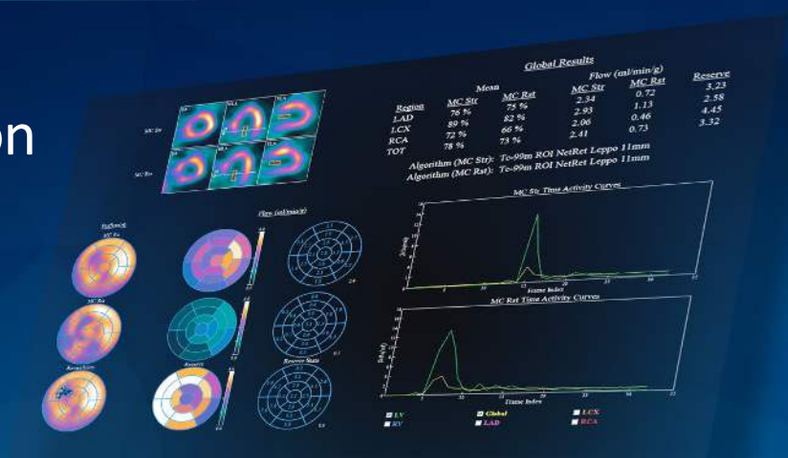
D-SPECT® Series

Industry Breakthrough, Dynamic SPECT Acquisition



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Nuclear Cardiology in the 21st Century

In the 21st century, most nuclear cameras are still relying on a technology invented in the 1950's (crystals and vacuum tubes). Spectrum Dynamics Medical changed all that several years ago with the introduction of the first clinical Cadmium Zinc Telluride (CZT)-based, nuclear cardiac imaging system, the D-SPECT® — and now the next generation, D-SPECT® Series.

D-SPECT Features	Benefits
Flexibility to image supine, upright, or any angle in between	Image even the most technically challenging patients
Chair/bed weight supports patients up to 1,000 lb/454 kg	Ability to image morbidly obese patients
Open design with no gantry motion	Eliminates claustrophobia and reduces chance of patient motion
Small camera footprint	Ideal room size 9.5' x11' or larger
Detector sensitivity up to 10x that of conventional cameras	Shorter imaging time, dose reduction, and ability to quantify coronary blood flow
CZT detectors with tungsten collimators	Opens the door to new clinical applications
Innovative proprietary reconstruction algorithm	Exceptional image resolution and quality

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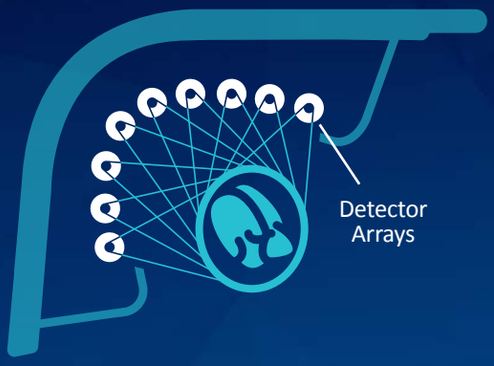
Where it All Starts...

From the inventors of BroadView swiveling CZT detectors:

Digital CZT-Based Detectors

The CZT modules, which consist of CZT plus the electronics, are populated on a column with tungsten collimators in front which channel the photons to the detector array. Using tungsten collimation improves sensitivity and removes the need for collimator exchange.

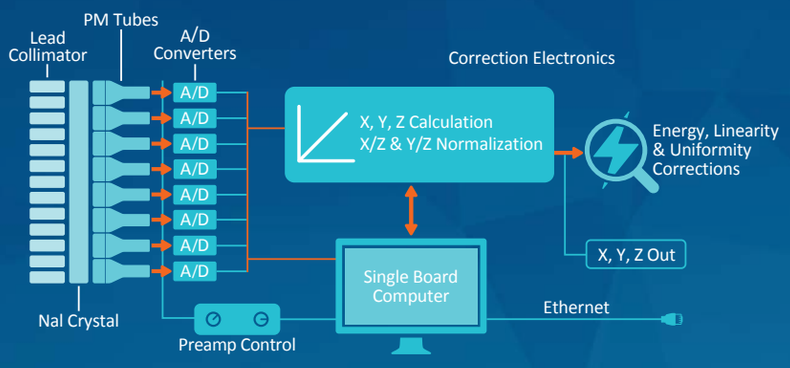
The semiconductor CZT, combined with our unique implementation of hardware and software, offers superior performance advantages over sodium iodide. Most notably, it delivers dramatic improvements in sensitivity and energy resolution. This gives the D-SPECT system the ability to acquire low-dose and simultaneous multi-energy studies.



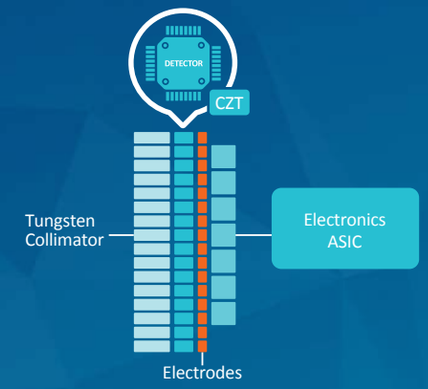
Detector Configuration and ROI-Centric Scanning

Comparison of Anger Scintillation and D-SPECT Solid State Technology

Anger Scintillator Technology



D-SPECT Solid State Technology



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Cardio and Vista Configurations

	D-SPECT Cardio	D-SPECT Vista
Detector Type	Pixelated crystals	Pixelated crystals
Number of Detector Columns	9	6
Max Count Rate with Scatter (cps)	>1,350,000 (with <5% count loss)	>900,000 (with <5% count loss)
Scan Acquisition Time (Average Dose)	≤3 min	≤5 min
Dose Management	Standard, half-dose and ultra-low	Standard and half-dose
Motion Correction	Yes	Yes
Option: Simultaneous Dual Isotope (SDI) Imaging	Yes	Yes
Option: Dynamic Acquisition for Myocardial Blood Flow Analysis	Yes	Requires detector upgrade
Option: TruPlanar Imaging Software	Yes	Yes
Option: TruCorr Attenuation Correction Software	Yes	Yes

Innovations that Transform Digital SPECT Imaging

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Acquisition and Advanced Reconstruction Algorithms

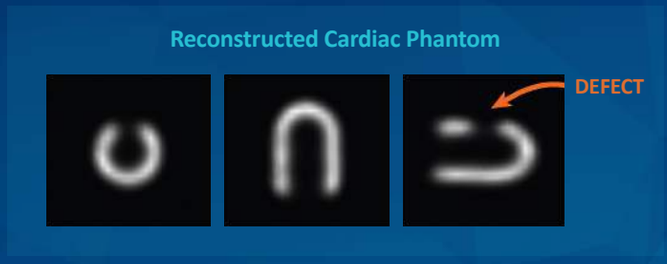
List Mode Acquisition

All acquisitions are acquired in list mode. This provides the capability to re-frame the data, allowing the operator to change a number of different parameters.

- Adjust the R-Wave windows
- Apply scatter correction and process the multiple isotope acquisitions within seven different energy windows
- Adjust energy window or compare different energy windows for the same acquisition

Reconstruction

Our advanced reconstruction algorithm is based on an OSEM iterative algorithm with resolution recovery. Multiple reconstruction options are included within the reconstruction software.

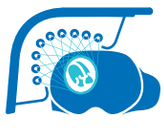


The model based reconstruction is a proprietary Spectrum Dynamics Medical algorithm and starts iterations from a model of the LV instead of a uniform image.

This model is calculated on initial OSEM iterations using identified myocardium contours to create a model that will be used as an “initial guess.” This method helps the reconstruction algorithm converge more quickly on an optimal solution and demonstrates a significant improvement of image properties and quality.

BroadView Technology
High-sensitivity swiveling digital detectors

Open Gantry
Preferred by patients, choice of scan position



Adaptive Field of View
ROI-centric: Scan focused where the heart is

Superior Image Quality
Advanced reconstruction for SPECT, 3D dynamic imaging

TruSPECT Workstation
TruCorr: Deep learning attenuation correction

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Clinical and Workflow Benefits

Fast results: The D-SPECT can acquire a complete gated SPECT study in as little as two minutes, improving clinical workflow, enhancing patient compliance and reducing the chance of patient motion.

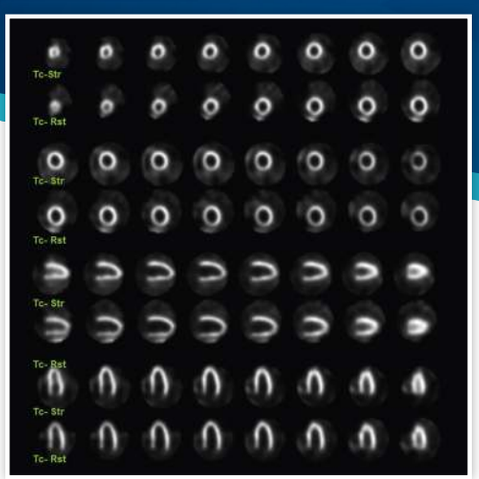
Image quality: D-SPECT's count-rich data sets combined with a proprietary reconstruction algorithm ensure optimal spatial resolution and exceptional image quality.

TruCorr: For high-quality SPECT, attenuation correction is essential. Spectrum Dynamics has developed a new methodology for attenuation correction for its D-SPECT systems. TruCorr uses deep learning to generate attenuation corrected myocardial perfusion images.

Dose reduction: The extremely high sensitivity of the D-SPECT detectors allows for dramatic reductions in injected dose. Patients and staff benefit from the lower radiation dose.

Simultaneous multi-isotope imaging (SDI): The exceptional energy resolution of CZT allows the detectors to acquire multiple energies at the same time with minimal down scatter. This makes simultaneous stress and rest imaging possible with perfect imaging registration, as well as new advanced, multi-isotope protocols such as 123I-mIBG or 201-Tl and 99mTc Sestamibi or Myoview.

Patient compliance: The open gantry design and the ability of the CZT columns to "swivel" back and forth allow the detectors, in an L-shaped array, to acquire data from the patient's left posterior oblique (LPO) to right anterior oblique (RAO) without the need to rotate the detectors around the patient. This eliminates the chance of an acquisition collision, pinch points, or claustrophobia that moving detectors can cause.



Gated SPECT study with standard doses

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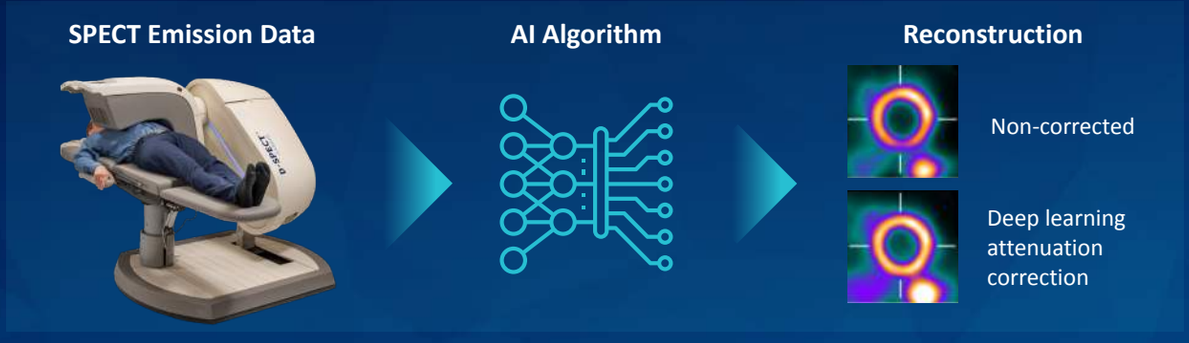
A Patient-Centered Innovation

TruCorr: Addressing the challenges created by attenuation artifacts

Spectrum Dynamics has developed a new methodology for attenuation correction for its D-SPECT digital cardiac camera. TruCorr is a revolutionary approach that uses deep learning to generate attenuation corrected myocardial perfusion images.



TruCorr Attenuation Correction

TruPlanar Imaging Acquisition Workflow

D-SPECT TruPlanar utilizes unique detector positioning to provide actual non-derived planar images for ERNA (MUGA), heart to contra-lateral ratio and more.

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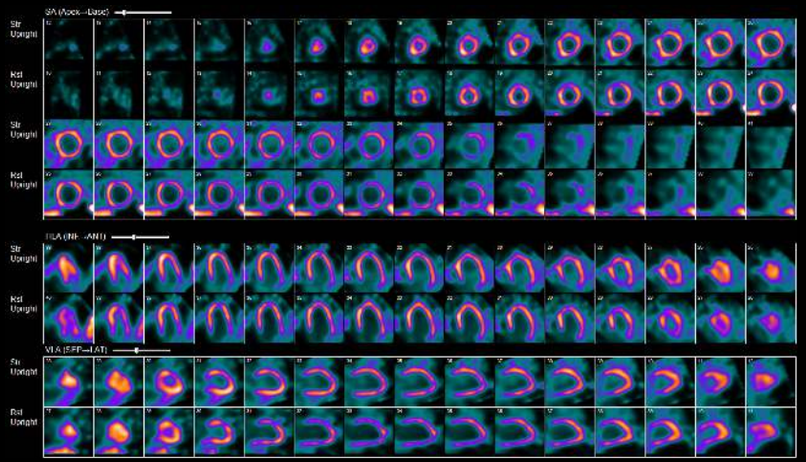
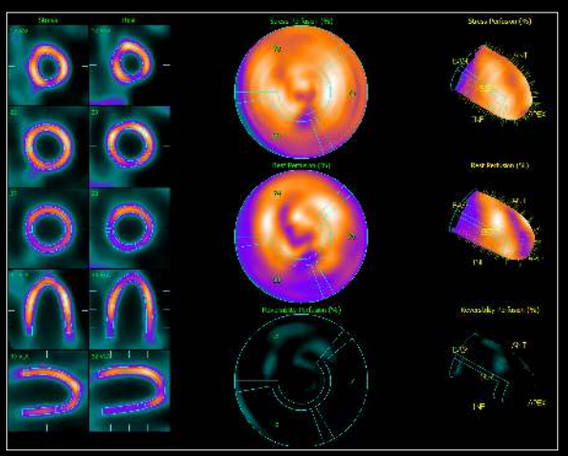
Image Gallery

LARGE BMI



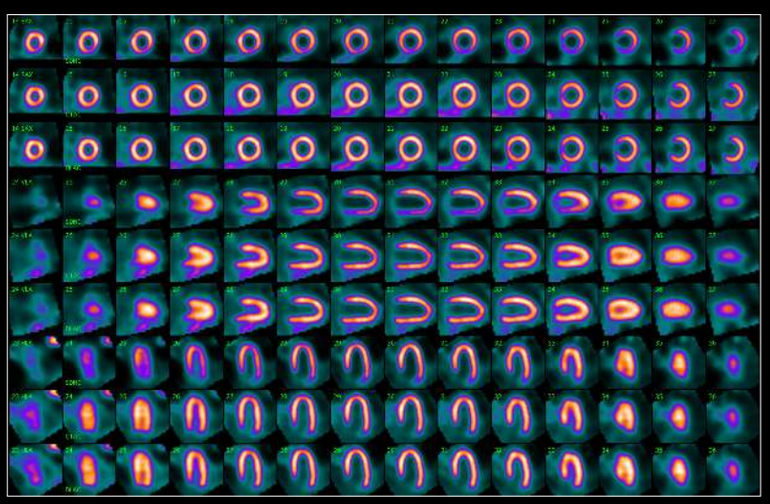
High BMI

QUANTITATIVE ANALYSIS



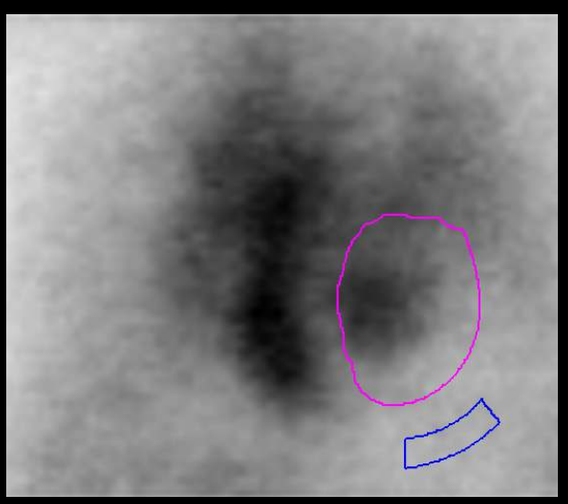
BMI of 63

TRUCORR COMPARISON



TruCorr: 1. Uncorrected MPI, 2. CTAC MPI, 3. TruCorr MPI

NATIVE PLANAR IMAGING



TruPlanar: Five minutes MUGA (ERNA)

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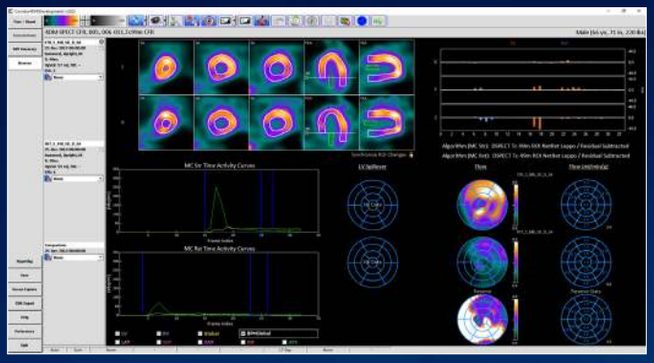
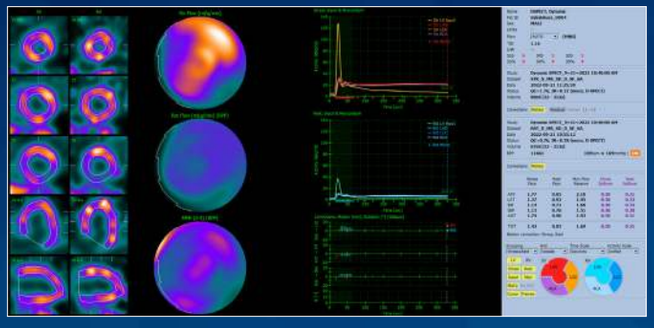
TruFlow Dynamic Imaging*





Highest sensitivity of any dedicated cardiac SPECT system provides the data needed for dynamic SPECT.

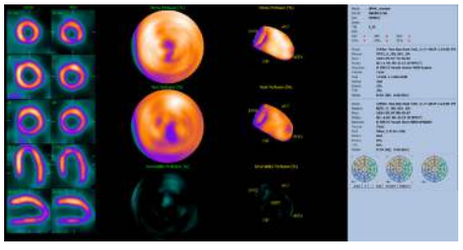
List mode acquisition and spline reconstruction provide flexibility for traditional, fast and future dynamic protocols.

Leverages the latest quantitative tools for quality and MFR analysis.

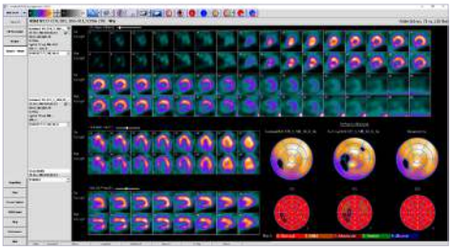
* Only available on the D-SPECT Cardio or 9-detector systems.

Available Quantitative Cardiac SPECT packages including semi-quantitative analysis of myocardial perfusion imaging and TruCorr.

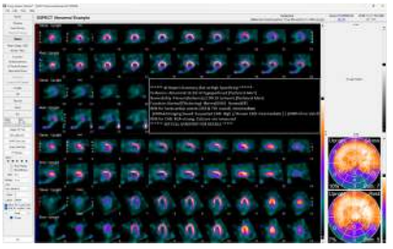
Cedars-Sinai | QGS + QPS



INVIA | 4DM



Syntermed | Emory Toolbox**



**Available in a stand-alone configuration only.

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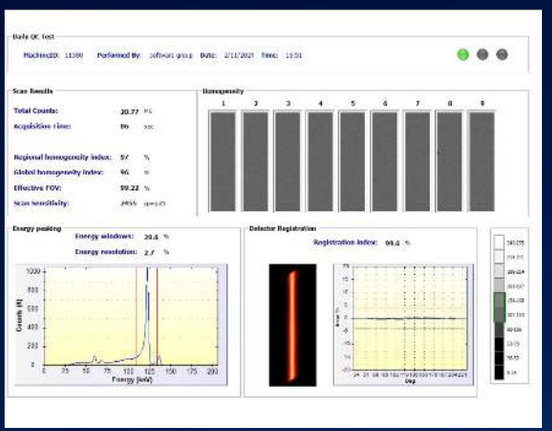
Quality Control and Connectivity

Quality Control

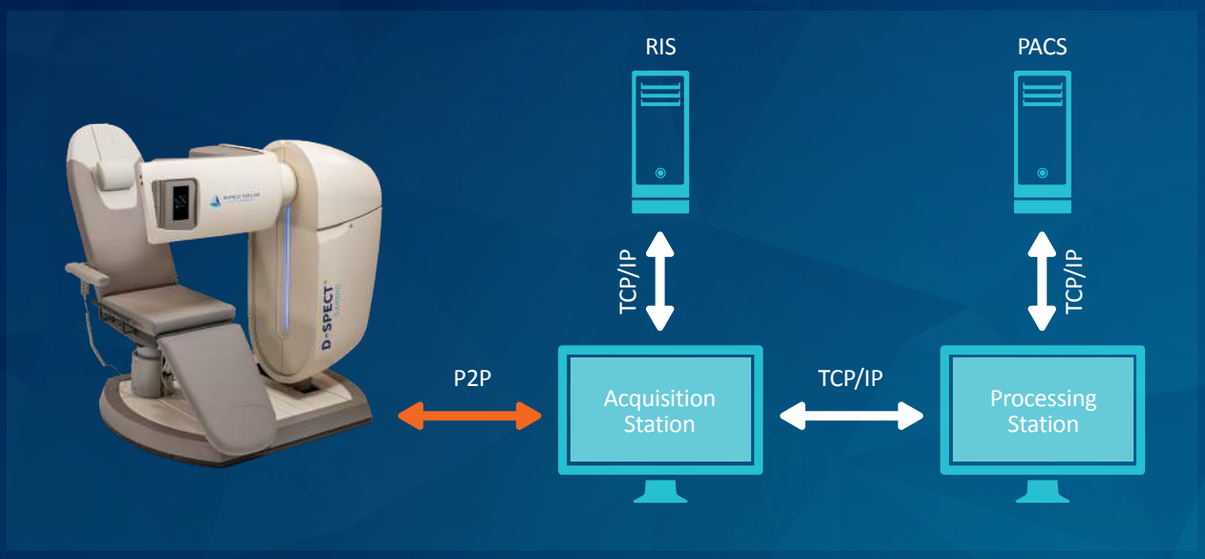
D-SPECT Cardio acquisition software incorporates a very simple-to-perform, ^{57}Co-based quality control acquisition that is executed daily and checks all key imaging parameters prior to clinical imaging. The procedure only takes a couple of minutes* to accomplish.



* Varies with source strength.

Connectivity

The D-SPECT Cardio can connect and transfer data back and forth to a wide variety of HIS/RIS systems, PACS servers, and other imaging devices using the DICOM standard. If you have questions regarding specific devices, Spectrum Dynamics Medical personnel can work with your IT department to demonstrate connectivity and data transfer procedures.



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Serviceability and Remote Diagnostics

The D-SPECT system was designed from the ground up with remote connectivity in mind. With the site's permission, regional specialists and/or factory trained engineers can log into your D-SPECT and perform almost any of the diagnostic technical functions a field service engineer (FSE) can complete on-site. Except for a part replacement, it is often possible to correct or implement a workaround solution remotely, allowing imaging to continue, while waiting for an FSE to arrive on-site.

With a team of specialists who can assist you remotely and some of the most experienced service engineers throughout the world, we are able to correct most problems immediately and maximize your site's uptime.

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Contact Us

Spectrum Dynamics Medical appreciates the opportunity to share our nuclear imaging solutions with you. To learn more about our products, services and how we can help you, please contact us.

Spectrum Dynamics Medical HK Limited
Unit 1001, 10/F,
Mira Place Tower A
132 Nathan Road,
Tsim Sha Tsui
Kowloon, Hong Kong

Spectrum Dynamics Medical SA
Rue de Lausanne, 31
1110 Morges Switzerland
Tel: +41 21 544 4710
Fax: +41 21 544 4711

Shanghai Guangmai Medical Technology Limited
708, Block A, No. 300,
Shuiyun Road, Pudong New District, Shanghai, China
Tel: 021-58281680

Spectrum Dynamics Medical, Inc.
301 North Cattlemen Road, Suite 109
Sarasota, FL 34232
Tel: +1 941 256 3541
Fax: +1 941 256 3832

Spectrum Dynamics Medical Japan K.K.
Uchikanda TK building 6F
South, 1-5-13 Uchikanda
Chiyoda-ku, Tokyo Japan
Tel: +81 3 5843-9304
Fax: +81 3 5843-9305

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