



NumaStore Preclinical™ FAQ

- 1. What is NumaStore Preclinical?**
- 2. How does NumaStore Preclinical work with Inveon?**
- 3. What data types does NumaStore Preclinical support?**
- 4. How much storage space do I need with NumaStore Preclinical?**
- 5. How does NumaStore Preclinical file compression work?**
- 6. How do I purchase NumaStore Preclinical?**
- 7. What is the installation process for NumaStore Preclinical?**
- 8. What is the support plan for NumaStore Preclinical?**
- 9. Are extended service agreements available for NumaStore Preclinical?**
- 10. What are the hardware and software system requirements for NumaStore Preclinical?**
- 11. Does NumaStore Preclinical support clinical data?**
- 12. Are turnkey hardware and software solutions available from Numa for NumaStore Preclinical?**
- 13. Can NumaStore run in a VMware or Virtual Environment?**
- 14. Is NumaStore Preclinical expandable?**
- 15. What are the sizes of the PET/CT image studies created by the Inveon system?**
- 16. What is the relationship between NumaStore Preclinical and the Siemens Inveon® IAW/IRW software packages?**

1. What is NumaStore Preclinical?

NumaStore Preclinical is an image storage and management solution designed to meet the specific needs of preclinical imaging departments. NumaStore Preclinical improves the workflow in the department by automatically backing up all image data created by all configurations of the Siemens Inveon™ PET/SPECT/CT scanners. NumaStore compresses the large image files using a lossless algorithm before storing them in local volumes or network shares, which saves costs by making efficient use of the storage hardware. Using NumaStore's intuitive interface, studies can be quickly organized by file name, date, project name and many other attributes. Studies are easily exported to Inveon Acquisition Workplace (IAW) or Inveon Research Workplace (IRW) for reprocessing and display. NumaStore Preclinical also supports clinical DICOM formats and connectivity. This allows NumaStore to be the central archive and image management solution for all your research and imaging needs.

2. How does NumaStore Preclinical work with Inveon?

NumaStore Preclinical monitors the data folders on the IAW using a network connection and windows file sharing to automatically copy data files to NumaStore. The only modification required on the IAW is to grant NumaStore Preclinical read access to these folders. NumaStore can be configured to check for new data at time increments that can vary between once a minute to once a week or more. Once stored, the NumaStore data can be queried, sorted, filtered and exported back to the IAW. See the [Inveon – NumaStore Workflow Drawing](#).

In addition, NumaStore Preclinical is able to store and manage DICOM data exported from the IRW. NumaStore can automatically copy data from any workstation that supports DICOM Query/Retrieve SCP. Users at systems, such as IRW, that support DICOM Query/Retrieve SCU can retrieve copies of studies that are stored in NumaStore in DICOM format. See the [Inveon – NumaStore Workflow Drawing](#).

3. What data types does NumaStore Preclinical support?

NumaStore Preclinical supports all data types created by the Siemens Inveon® Preclinical platform including: raw projections, reconstructed, dynamic, gated, dynamic-gated, histogrammed, sinogram, list mode data, and calibration data. NumaStore Preclinical also supports DICOM images from IRW.

4. How much storage space do I need with NumaStore Preclinical?

There are many variables that determine the amount of storage that is required for a specific image, study or project. Some of the variables include the number of projections, matrix size and modality along with the amount of raw, reconstructed, histogrammed, list mode and calibration data acquired. For example a single typical PET/CT scan that includes raw CT, reconstructed CT, reconstructed PET, histogrammed PET, list mode and calibration data can range from 2.4 GB to 112 GB uncompressed or 971 MB to 44.8 GB compressed. Multiply this by the 100 scans and the amount of compressed data or the storage requirement becomes 95 GB to 4.4 TB. [Contact Numa](#) for more information on storage requirements.

5. How does NumaStore Preclinical file compression work?

NumaStore Preclinical employs [7-Zip](#) to quickly and efficiently compress larger files, a lossless algorithm protects data integrity. The overall compression ratio for the different data types is roughly 40%. The chart below shows typical results for specific data types.

Modality	Average Compression (%)	Raw Data Compression (%)	Sinogram Compression (%)	Image Compression (%)	Calibration Data Compression (%)
PET	55	84	15	44	79
CT	49	59	N/A	39	59
SPECT	9	80	8	14	4

6. How do I purchase NumaStore Preclinical?

NumaStore Preclinical can be purchased from Numa Inc. Numa representatives will work with you to answer any questions and configure a NumaStore Preclinical system to meet the workflow and storage requirement of your department. Interested parties should contact Numa directly at:

Telephone: 1.800.733.6862 (US and Canada only)
 1.603.883.1909
 Email: sales@numa-inc.com
 Web: www.numa-inc.com

7. What is the installation process for NumaStore Preclinical?

When an order is received, a Numa project manager will work with your department to coordinate the installation. A survey is completed to learn the specifics of the department’s equipment and network configuration. A requirements document is sent out to prepare for the installation. An installation date is scheduled and a Numa engineer performs the software installation, configuration and testing. A training session is scheduled to review the operation of NumaStore Preclinical with the end user(s).

8. What is the support plan for NumaStore Preclinical?

NumaStore Preclinical's warranty includes technical support, software updates, disaster recovery and remote status reviews. Numa also offers extended warranty and service agreements. Customers are instructed to contact Numa technical support for service on NumaStore Preclinical. Numa's support can be reached by:

Telephone: 1 (800) 733-6862 (US and Canada only)
1 (603) 883-1909 Ext. 300
Email: techsupport@numa-inc.com
Web: www.numa-inc.com/support

9. Are extended service agreements available for NumaStore Preclinical?

Yes, Numa offers extended service agreements for NumaStore Preclinical that include technical support, software updates and options for disaster recovery support and remote status reviews. [Contact Numa technical support](#) for more information.

10. What are the hardware and software system requirements for NumaStore Preclinical?

For software-only installations the customer/site must supply the computer system or VMware environment for proper operation of the NumaStore software. Below are the [minimum](#) and [recommended](#) hardware and software requirements, however Numa recommends that customers consult with Numa for the specifications that meet the workload and workflow requirements for each application.

Minimum Requirements:

- Minimum Software Requirements for NumaStore Preclinical:
 - Microsoft Windows[®] XP or Windows 7
 - Microsoft MSDE SQL Server Express[®]
 - RealVNC[®] remote control (for Numa technical support)
- Minimum Hardware Requirements:
 - Microsoft Windows[®] compatible computer system
 - Dual Core CPU, 2 GB RAM, 200GB hard drive, and a network card
 - Internet connectivity

Recommended Requirements:

- Recommended Software Requirements of NumaStore:
 - 64-bit Microsoft Windows[®] 7 Pro or higher
 - Microsoft MSDE SQL Server Express[®]
 - RealVNC[®] remote control (for Numa technical support)
 - Antivirus software
 - OS, database, image backup and recovery software
- Recommended Hardware Requirements for NumaStore:
 - Windows[®] Compatible Computer System
 - <2.0GHz quad core CPU; 8GB RAM
 - 160 GB mirrored hard drive for the operating system
 - 160–500GB cache hard drive
 - 2 network cards
 - 2 TB or more of RAID storage
 - 17" monitor
 - Uninterruptible power supply (UPS)
 - Backup storage device
 - Internet connectivity

11. Does NumaStore Preclinical support clinical data?

Yes, NumaStore Preclinical is a customized version of the popular NumaStore Image Management system that supports many vendors' imaging systems, multiple modalities and several versions of DICOM and non-DICOM image formats. [Contact Numa](#) for more information.

12. Are turnkey hardware and software solutions available from Numa for NumaStore Preclinical?

Yes, Numa can supply hardware, software and onsite installation support for customers in North America. For customers outside the United States, please contact Numa for information on configuration options and hardware support. Numa has several hardware configuration options and will work with you to match your budget and workflow requirements. Numa will build the system to your specifications and install it in your department. [Contact Numa](#) for more information.

13. Can NumaStore run in a VMware or Virtual Environment?

Yes. Please see the [NumaStore Preclinical system requirements](#) or [contact Numa](#) for more information

14. Is NumaStore Preclinical expandable?

Yes, NumaStore Preclinical can be expanded in many ways, including:

- Support the full versions of Microsoft SQL (i.e., non Express)
- Connections to additional Inveon systems
- Connections to other DICOM compliant workstations and systems
- Additional hardware storage options

[Contact Numa](#) for more information.

15. What are the sizes of the PET/CT image studies created by the Inveon system?

The tables below list the sizes of the image/data files created using different PET/CT acquisition and reconstruction protocols of the Inveon system. This information can be used to calculate the amount of storage space required for NumaStore Preclinical. Multiply the size of types of images to be created by the number of images and compression percentage. Information about NumaStore's image compression is available [here](#).

Raw CT Projection Data: 16-bit Unsigned Integer Data 220 / 360 Projections

Note: The average data size for projection data will be between 167–3,000 MB.

	512 X 768	1024 X 1024	1024 X 1536	2048 X 2048	2048 X 3072	4064 X 4096
220	167 MB	446 MB	669 MB	1.8 GB	2.7 GB	6.9 GB
360	272 MB	726 MB	1.1 GB	2.9 GB	4.4 GB	11.5 GB

Reconstructed CT Image Data: 16-bit Signed Integer Data

Note: The average reconstructed CT image size will be between 384–3,000 MB.

	512	768	1024	2048	3072	4096
512 X 512	250 MB	375 MB	500 MB	1 GB	1.5 GB	2 GB
1024 X 1024	1 GB	1.5 GB	2 GB	4 GB	6 GB	8 GB
2048 X 2048	4 GB	6 GB	8 GB	16 GB	24 GB	32 GB
4064 X 4096	16 GB	24 GB	32 GB	64 GB	96 GB	128 GB

Histogrammed PET Data: 16-bit Integer

Note: The average sinogram size will be from 168–5,000 MB.

	Static Data w/ 27 segments	Dynamic Data w/30 frames	Gated Data w/4 Gate Bins	Gated Data w/8 Gate Bins	Dynamic-Gated Data w/30 Frames and 4 Gate Bins	Dynamic-Gated Data w/30 Frames and 8 Gate Bins
128 X 160 X 159	168 MB	X27 X30 = 5 GB	X27 X4 = 670 MB	X27 X8 = 1.3 GB	X30 X4 = 20.1 GB	X30 X8 = 40.2 GB

Reconstructed PET Data: 32-bit float data

Note: Typical reconstructed PET image sizes will range from 10–300 MB.

	Static PET Data	Dynamic PET Data w/30 frames	Gated PET Data w/4 Gate Bins	Gated PET Data w/8 Gate Bins	Dynamic-Gated PET Data w/30 Frames and 4 Gate Bins	Dynamic-Gated PET Data w/30 Frames and 8 Gate Bins
128 X 128 X 159	10 MB	298 MB	40 MB	80 MB	1.2 GB	2.4 GB
256 X 256 X 159	40 MB	1.2 GB	159 MB	318 MB	4.8 GB	9.6 GB

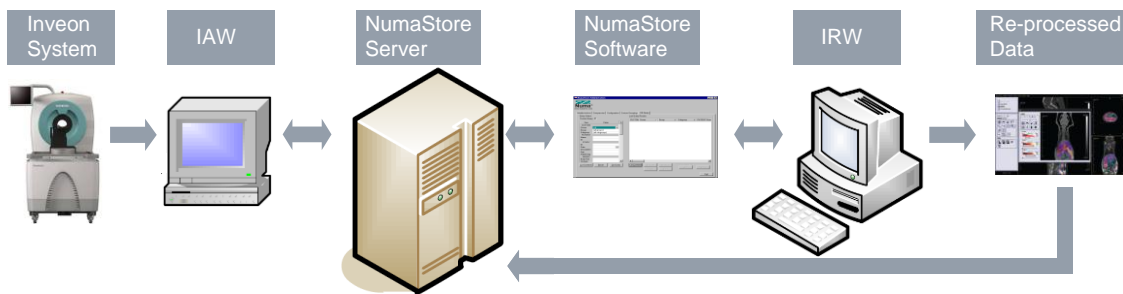
Listmode Data:

Raw scanner acquired data will typically range from 1–100 GB. It is difficult to estimate this as it will depend heavily upon how long the acquisition is and how much activity is injected into the subject. Average PET listmode size will be on the order of 1 GB for a 15–20 minute acquisition at normal mouse doses of 150-200 μ Ci . SPECT listmode sizes will typically be smaller with 45 minute acquisitions resulting in listmode sizes on the order of 700 MB

Calibration Data:

- PET Normalization Data \approx 340 MB
- Attenuation and Blank Data \approx 340 MB
- SPECT Normalization Data \approx 40 kB
- SPECT Energy Lookup Data \approx 80 kB
- SPECT Crystal Lookup Data \approx 10 MB

16. What is the relationship between NumaStore Preclinical and Siemens Inveon® IAW/IRW software packages?



NumaStore workflow with IAW and IRW

- IAW creates the standard data types
- NumaStore Preclinical software monitors IAW folder locations for any new data
- NumaStore Preclinical software transfers all raw and image data to the storage location
- Data is added to the NumaStore queryable database using information in data headers
- Stored data is searched for and retrieved to post-process the data using IRW
- Data processed using IRW software can be "pushed" to the Numastore storage location using DICOM SCP/SCU communication protocols.