

GE
Sensing & Inspection Technologies
phoenix|x-ray

Save up to 5x operator time!

phoenix datos|x 2.0

Advanced CT software for fully automated data acquisition and volume processing in phoenix|x-ray computed tomography systems



click & measure|CT:

Automated execution of CT scan, reconstruction and analysis process



GE imagination at work

phoenix datos|x 2.0 CT software:

3D failure analysis and metrology with phoenix|x-ray CT systems as fast and easy as never before

With datos|x 2.0, the entire CT process chain can be fully automated. This minimizes operator time and influence, while highly increasing the repeatability and reproducibility of CT results. Once the appropriate setup is programmed, the whole scan and reconstruction process incl. volume optimization features (e.g. automatic beam hardening correction) or surface extraction can be fully automated. Furthermore, 3D failure analysis or metrology tasks like generation of first article inspection reports can be executed automatically.



phoenix datos|x 2.0

CLEAR: highly improved interface for ease of use and intuitive process flow

EFFICIENT: working time to operate the CT system decreases by a factor of up to 5 compared with datos|x 1.0

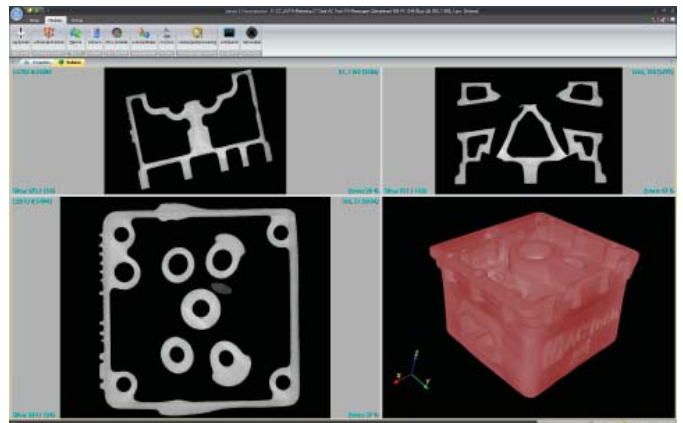
AUTOMATIC: batch processing tools for data acquisition, volume reconstruction and 3D analysis

EASY: dramatically reduced training requirements and operator influence

FLEXIBLE: functionality and interfaces for customized CT solutions

Clear: improved user friendliness and process flow

- **Intuitive graphical user interface** for easy usage and a fast learning curve
- **Process flow orientated function tool bar** for step-by-step workflow setup with intuitive user interface
- **Clear display of CT results:** volume visualization in 2D axis views and 3D render mode

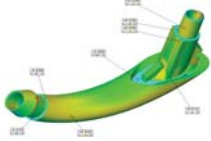


Efficient operation



- **Reproducible high resolution CT results even by unskilled operators** after minimal training
- **High level of automatization** decreases working time to operate the CT system by a factor of up to 5 compared with datos|x 1.0
- **Automated system calibration functions** (e.g. X-ray tube, detector)

Automated acquisition, reconstruction and analysis



phoenix datos|x 2.0:
The whole CT process
without any user inter-
action

• „click & measure|CT“ functionality: from scan start to displaying and analysis of the 3D results on the screen without manual user interaction in just 3 steps:

- 1) Insert the work piece
- 2) Start the scan
- 3) Check results

• **Complete automation** of the full CT data handling chain (system calibration e.g. tube & detector), data acquisition, volume reconstruction / optimization and CT data processing

• **Automated multi-object scans:** Scan, reconstruct and process different objects with different parameters with just one setup and no further interaction



Easy: no CT-experts for operation required

• **Support of different user levels** (expert & operator) to allow CT scans and data processing with minimum training effort (< 1 h for operators)

- **Improved usability** of functions for intuitive scan setup
- **Wizard** for simple and automated scanning and reconstruction of large objects (Multiscan)
- **Automated processing** of standard tasks in acquisition and reconstruction (tube initialization, detector calibration, data correction, reconstruction, etc.)

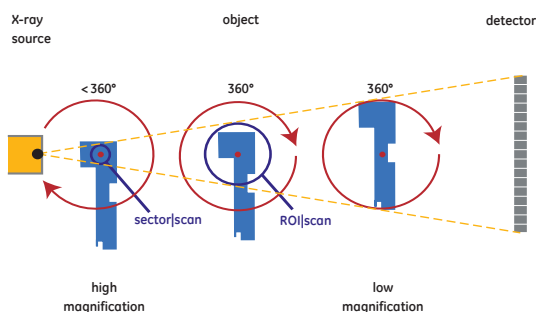


phoenix datos|x 2.0 offers two different modes:

Operator mode focussing on the basic features ensures running the system for industrial analysis and metrology tasks with a minimum of operator training

Expert mode grants full access to all available functions and parameters for extreme flexible use of the system for scientific research and programming of quality analysis tasks

Flexible functionality for customized CT



ROI|scan and sector|scan:
phoenix|x-rays variety of CT modules offers a wide spectrum of applications.

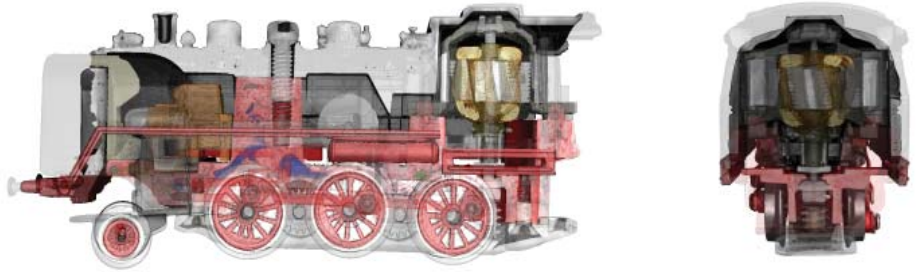
• **Different application-specific scan modes:**

- **fast|scan** for ultra quick CT scans as fast as up to 10 seconds
- **sector|scan** with <math>< 360^\circ</math> rotation e.g. for high resolution scans of objects like circuit boards (partial angle CT)
- **multi|scan:** automated complete scans of long objects and automatic volume stitching
- **ROI|scan:** high resolution scans of subregions of large objects

• **External triggering** of CT scanner by digital hardware signal allows integration of customer specific solutions like e.g. automated sample changer

• **multi|volume** reconstruction for ultra large volume data sets which exceed physical memory

• **Interface** to various external software packages for further automatic volume processing (e.g. Polyworks Inspector™, VGStudio-MAX, and others)



Features

datos|x 2.0 acquisition:

- Software interface for integrated control of the system (X-ray tube, detector, sample manipulator) for setup and start of high quality CT scans.
- Automatic system monitoring and system preparation for CT scan (detector calibration, tube conditioning etc.)
- Support of all phoenix|x-ray tubes and various flat-panel, multiline and line detectors
- Allows execution of complete automatic measurement process from one screen (scanner initialization, projection data recording, data optimization, reconstruction and data analysis)

datos|x 2.0 reconstruction:

- Ultra fast generation of volume data using velo|CT, a proprietary GPU based reconstruction technique
- Volume visualization in slice views (xy, xz, yz) and 3D render mode
- Diverse automatic volume optimization functions (e.g. filter functions for noise reduction, ring artifact reduction)
- Interface to various external software packages
- Automated processing of standard tasks

Modules

- | | |
|----------------------|---|
| • velo CT | GPU based reconstruction acceleration for CT results within just a few seconds or minutes, depending on the volume size |
| • agc module | automatic geometry calibration |
| • bhc+ module | beam hardening correction, automatic for of one-material samples |
| • rar module | automatic effective ring artifact reduction |
| • surface extraction | extraction of surface data (point cloud or polygon data) from the volume |
| • easy calib | adjustment of system geometry for high precision 3D metrology and traceability |
| • scan optimiser | optimization of high-resolution scans by automatic compensation of drift-effects |
| • sector scan | scanning with <math><360^\circ</math> rotation for maximized magnification (partial angle CT) |
| • fast scan | quick CT acquisition with continuous sample rotation |
| • multi scan | automated complete scans of long objects and automatic volume stitching |
| • multi volume | reconstruction for ultra large volume data sets which exceed physical memory |

Availability

- | | |
|--------------------|--|
| • New CT standard | datos x 2.0 is available on all new phoenix x-ray CT systems of GE Sensing & Inspection Technologies |
| • Retrofit package | for phoenix x-ray CT systems equipped with datos x 1.0 |



phoenix datos|x 2.0 - Your Advantages

- **click & measure|CT: Fully automated data acquisition and volume processing**
- **Reproducible high precision metrology and failure analysis tasks performed with minimal operator training**
- **Significant reduction of required operator time by a factor of up to 5**
- **Automatic generation of first-article-inspection reports in < 1 hour possible**
- **Wide spectrum of modules for ease of use and accurate CT results**



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