

# Digital Mammography: Hologic Dimensions 3D™



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## Introduction

The Hologic Dimensions 3D training course will provide engineers the necessary knowledge to maintain Dimensions 2D or 3D Tomo systems. This course is designed to give the service professional the insight to evaluate image quality problems, determine if the mammographic unit is the source of the image problem and take the appropriate steps to correct the deficiency.

Given today's regulatory environment maintaining the system at peak performance is of the utmost importance.

At the completion of this course students will be able to perform all Dimensions system maintenance procedures including:

- System installation
- Calibration (including Tomo)
- Gantry maintenance
- AWS (Acquisition Workstation) maintenance
- Imaging chain maintenance
- Detector pixel mapping
- Preventive maintenance
- Troubleshooting

## Prerequisites

To attend this course, the service professional must have attended Phase I and possess fundamental knowledge and understanding of the principles of X-ray and basic electronics.

## Objectives

- Identify the major components of the Dimensions system
- Describe the functional characteristics of each sub-system of the Dimensions system
- Describe the factors that affect digital mammographic image quality
- Describe how those factors are optimized to produce the highest quality digital mammographic images
- Complete all operator, administration, and application tasks
- Fully install the Dimensions system and related components
- Describe the function of the basic components of the Hologic Dimensions mammographic unit
- Perform the necessary tests to reproduce the results of the

physicist's report to confirm corrective action

- Perform all system calibrations and adjustments to maintain the highest quality images and compliance with MQSA requirements
- Perform detector related maintenance and Pixel mapping procedures to maintain detector image quality over time
- Demonstrate competence to be able to handle AWS maintenance, backup, restore, and calibrations
- Perform complete Preventive Maintenance procedures as performed by the OEM
- Evaluate circuit functions to facilitate troubleshooting

## Course Outline

### Day 1

- Course introduction
- Dimensions system overview
- Dimensions system
  - o Components
  - o Dimensions terms/acronyms
  - o System documentation
  - o Manual set overview
- System logins
- Mammographic regulatory overview
- Dimensions quality control
- Functional checks
- Lab Activities
  - o Major system component identification

**Note:** Due to copyright laws, students are required to purchase and bring to class a copy of the Dimensions OEM manuals set. Contact your dealer to order the manual set if you do not have the documentation with your system.

- 1 Manual, Dimensions - Instructions for Use or Operators Manual
- 1 Manual, Dimensions - QC Manual
- 1 Manual, Dimensions - Service Manual
- 1 Manual, Dimensions - User Guide (includes Tomosynthesis)

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- o System turn-on
- o System logins
- o System power-down
- o Image quality
  - Resolution
  - Contrast
- o Signal to noise
- o MTF
- o Flat field/Phantom IQ
- o QC Testing & Checks

## Day 2

- System power
  - o AWS
  - o Gantry
  - o Brick
  - o Detector
  - o Turn-on circuits
- System communications
- Dimensions operations
- AWS acquisition software
- Operators console
- User interface/application
  - o Image acquisition
  - o Image viewer
- Lab Activities
  - o Remove and replace covers and system panels
  - o Component identification
    - AWS
    - Gantry
    - Detector
  - o Component location
    - Schematic location
    - Physical location
    - Connector locations
    - Fuse location/identification

## Day 3

- System service
- Required tools and test equipment
- Device/output configuration
- System calibration
  - o Tube bias
  - o Filament calibrations
  - o X-Ray Field alignment
  - o Light to X-Ray Field alignment
  - o AEC calibration
- Image and detector maintenance
- Detector calibration
- Gcal (Geometry Calibration)
- C-Arm & Tomo Calibrations
- Lab Activities
  - o kV calibration
  - o mA calibration
  - o Tubehead Adjustments
  - o C-Arm & Tomo Calibrations
  - o AEC calibration
  - o Detector flat field calibration
  - o Pixel mapping
  - o Recalibrate newly mapped detector

## Day 4

- Backups
  - o AWS
  - o User preferences
  - o Gantry/tubehead calibration data
- Restore system components from backup
- Operating system installation procedure
- AWS application installation procedure
- Lab Activities
  - o Backup AWS

- o Backup user preferences
- o Backup gantry/tubehead calibration data
- o Complete restore from backup
- o Clean OS install
- o Application install
- o System restore from previous backup
- Preventive maintenance
- Lab Activities
  - o PM Procedures
  - o Dimensions PM worksheet
- Troubleshooting
  - o Error codes
  - o System diagnostics
- Lab Activities
  - o Troubleshooting using defective/bug boards
  - o Using Service Tools & Diagnostics
    - SANDRA
    - CAN Bus tools & troubleshooting

## Day 5

- Troubleshooting (Cont'd)
  - o Error codes
  - o System diagnostics
- Course review
- Course evaluation
- Final exam