# CustusX System Test

Version 1.1 – 2011/02/16

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| Tester |  |
| CustusX version |  |
| Date |  |

The system test is designed for two different scenarios:

1. Baatfantom + US acquisition.
2. DICOM data via OsiriX

Parts of the test is designed to work with one of these scenarios, and vice versa. For a full test, run the test twice with different data sets, and perform the tests that is appropriate for that scenario.

Not all parts of the tests need to be completed, but it is important to describe what has been done and what has been omitted.

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| Data sets used: |
| Comments: |
| Test passed: |

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| **ID** | **Description** | **Pass/ Fail** | **Comment** |
| 1 | Data Import |  |  |
| 1.1 | OsiriX |  |  |
| 1.1.1 | Import a DICOM volume (Kaisa) into OsiriX. |  |  |
| 1.1.2 | Segment out some interesting features. (Set output value > 300, because of Osirix bug) |  |  |
| 1.1.3 | Save volume and segmented volume to mhd format (use CustusX plugin). |  |  |
| 1.1.4 | Save surface to stl format., by using ”Surface rendering”. Add .stl as file ending in Finder afterwards |  |  |
| 1.2 | ITK\_snap |  |  |
| 1.2.1 | Import a volume |  |  |
| 1.2.2 | Segment out features |  |  |
| 1.2.3 | Save segmented volume (.mhd) and surface (.stl and .vtk format) |  |  |
| 1.3 | CX3 volume import |  |  |
| 1.3.1 | Create new patient |  |  |
| 1.3.2 | Import one volume (repeat for all volumes) |  |  |
| 1.3.3 | add to view |  |  |
| 1.3.4 | Verify correct placement relative to other volumes |  |  |
| 1.3.5 | set 3D transfer function (color+alpha) |  |  |
| 1.3.6 | set 3D shading |  |  |
| 1.3.7 | set 2D window+level |  |  |
| 1.3.8 | Create meshes of segmented volumes |  |  |
| 1.4 | CX3 mesh import (repeat for all meshes) |  |  |
| 1.4.1 | Import mesh, align to a previously imported volume |  |  |
| 1.4.2 | Verify correct placement |  |  |
| 1.4.3 | Change mesh color+opacity |  |  |
| 2 | Preop planning |  |  |
| 2.1 | Enter Preoperative Planning Workflow |  |  |
| 2.2 | Navigate using drag and zoom in 2D. |  |  |
| 2.3 | Navigate in 3D with pan, zoom, rotate. |  |  |
| 2.4 | Add a cropping box. |  |  |
| 2.5 | Add two clip planes. |  |  |
| 2.6 | Change to all available layouts. |  |  |
| 2.7 | Create a custom layout with 3D+ACS+Any+Side+Radial |  |  |
| 3 | Registration |  |  |
| 3.1 | Go to Registration Workflow.  Perform image registration. |  |  |
| 3.2 | Give each fiducial a name. |  |  |
| 3.3 | Connect a tracking system (chose one) and start tracking. |  |  |
| 3.4 | Perform patient registration. |  |  |
| 3.5 | Verify the accuracy using a pointer. |  |  |
| 3.6 | Add a manual offset and verify using a pointer. |  |  |
| 3.7 | Save the patient. |  |  |
| 4 | US Acquisition |  |  |
| 4.1 | Select a configuration (depth, scanner, probe etc.) |  |  |
| 4.2 | Go to Intraoperative Acquisition Workflow.  Use US Acquisition and scan and reconstruct phantom with some easily identifiable structures (boat phantom) |  |  |
| 4.3 | Perform an acquisition of the entire volume (moving along all pins in a 'U'-trajectory for boat phantom) |  |  |
| 4.4 | Add volume to view, set transfer function and window/level. |  |  |
| 4.5 | Go to Intraoperative Planning Workflow.  Verify the accuracy using a preoperative volume (CT/MR). Check both in 2D and 3D. |  |  |
| 4.6 | Verify the accuracy using a pointer. Check both in 2D and 3D. |  |  |
| (4.7) | Perform new reconstruction: Select PNN algorithm, 20Mb volume size. Repeat 4.4 and 4.5 |  |  |
| 4.8 | Angio test: Turn on Doppler on the US scanner and select angio data in the “US Reconstruction” widget. Scan a suitable area – like the coronary artery. Verify that the reconstruction only reconstructs the colored area. |  |  |
| 5 | US accuracy |  |  |
| 5.1 | Scan an accuracy phantom (like the wire target phantom) |  |  |
| 5.2 | Verify the accuracy using a pointer. Check both in 2D and 3D. |  |  |
| 5.3 | Measure the accuracy by marking points in both the US volume and the phantom model |  |  |
| 6 | Navigation |  |  |
| 6.1 | Enter Navigation workflow. |  |  |
| 6.2 | Navigate using pointer in various layouts, using 2 imported and registered volumes. |  |  |
| 6.3 | Add an interactive clip plane to one of the volumes, navigate. |  |  |
| 6.7 | Navigate simultaneously in volume and surface data. |  |  |
| 7 | Session / Desktop |  |  |
| 7.1 | Enter each workflow state, verify that the default dektop is ok. |  |  |
| 7.2 | Add some widgets, save desktop. |  |  |
| 7.3 | Change workflow, then go back and verify that the widgets you added are still there. |  |  |
| 7.4 | Reset desktop to get back to initial desktop. |  |  |
| 7.5 | Save the patient. |  |  |
| 7.6 | Restart CustusX and load the session. Navigate. |  |  |
| 7.7 | Select new session. Verify that nothing remains of the previous session. |  |  |
| 10 | Other |  |  |
|  | Metrics: Open the metrics widget.  Add a point in the data space  Add a point at the tool tip.  Add a distance between them. |  |  |