

# CustusX release notes

## v18.04

### New features

Key	Summary	Release Note
CX-114	Support for OpenIGTLink3	OpenIGTLink version 3.0 is now used by CustusX.
CX-117	Upgrade to vtk 7 to get OpenGL2 support	CustusX now uses a fork of VTK 7.1.0
CX-143	Upgrade to Ubuntu 16.04	Compiles and runs on Ubuntu 16.04
CX-197	BK scanner support	Initial BK scanner support, using the PLUS framework.
CX-208	Update Eigen to 3.2.10	Updated Eigen to compile with FAST. However, later versions like e.g. 3.3.3 gives build errors.
CX-216	CustusX should be able to read *.vtp files and use colors from surface files.	We can now read .vtp surface files. And in the Mesh Properties there is now a checkbox for using the colors encoded in the surface file.
CX-218	Centerline registration	<p>Centerline registration is an image-to-patient registration method to match a centerline extracted from a preoperative image to tracking data from a tool.</p> <p>Intended use: Endoscopy in esophagus (local/updated registration during procedure).</p> <p>Translation along each axis (x,y,z) and rotation around each axis can be turned on/off.</p> <p>Prepare: A centerline can be created from sampled points along a structure in an image (e.g. if automatic segmentation and centerline generation fails).</p> <p>Input: centerline .vtk file + tracking data from endoscope Output: Updated image to patient registration</p>
CX-226	Bronchoscopy image2image registration	<p>Bronchoscopy ImageToImage registration is used to match airway centerlines in two volumes.</p> <p>Intended use: For multimodal image registration in bronchoscopy (CT, PET, MR). E.g. to register a high-resolution CT to a low-resolution CT acquired with PET (PET-CT), to register PET to the high resolution CT.</p>
CX-230	Add a possibility to remove the tool from 2D	Added a right mouse button option to remove the tool and crosshair from the 2D view.
CX-238	Remove TSF and levelset	The Tube segmentation filter and the levelset algorithm has been removed as they are no longer maintained. The Airways segmentation filter is now the filter to use.
CX-240	Correct refresh and behaviour of tool colors	<ul style="list-style-type: none"><li>- Added refresh of the tool colors from the preferences dialog.</li><li>- Set opacity as well.</li><li>- Draw the 2D crosshair below the offset point.</li><li>- Improved button names and help text.</li></ul>
CX-243	NIfTI reader	NIfTI file import is implemented.
CX-247	Need ImageToImage registration algorithm which uses point metrics as landmarks	Added a button in the landmarks registration widget which lets you import point metrics in the patient as landmarks.
CX-262	Delete all landmarks button	Added a button in the registration widget to delete all landmarks.
CX-267	Make CustusX compile on macOS Sierra	CustusX compiles on macOS 10.12 (Sierra).
CX-273	Upgrade to ITK 4.12.0	Upgrade ITK from 4.8.2 to 4.12.0
CX-277	Make system specific build instructions	Build instructions are now made more complete.

CX-278	Make Anglecorrection open source	Anglecorrection plugin is now open source.
CX-281	Make it possible to turn off interpolation in 2D slices	Added checkbox in preferences to switch between nearest and linear interpolation in 2D slices.
CX-287	Move the Virtual Bronchoscopy plugin to CustusX	The Virtual Bronchoscopy plugin is now a part of the open source CustusX repository.
CX-300	Tracking with OpenIGTLink	CustusX can now use tracking over OpenIGTLink. It is also possible to use PLUS for tracking.
CX-302	Support Mac OSX 10.13 High Sierra	CustusX builds and runs on macOS 10.13 (High Sierra).
CX-310	Trouble with Nvidia drivers on Ubuntu 16.04	Ubuntu 16.04 with NVIDIA needs to use NVIDIA driver version 375.82.
CX-312	Fix Windows linking in example plugin	The code in the example plugin now links correctly.
CX-321	User support plugin issues	Added short plugin troubleshooting section to plugin help page.
CX-323	Improve build instructions	Build instructions at <a href="https://www.custusx.org/uploads/developer_doc/nightly/build_instructions.html">https://www.custusx.org/uploads/developer_doc/nightly/build_instructions.html</a> have been improved.
CX-336	Simple user interface to BK scanner	Initial version of a simple GUI for BK connection with PLUS. Usable, but not completely finished. Not fully synchronized with existing start/stop tracking button.
CX-345	Install video grabber driver on Ubuntu 16.04	Ephiphan video grabber works with Ubuntu 16.04.

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## Bugfixes

Key	Summary	Release Note
CX-63	Layout 3D ACS x1 shows white 3D view	Fixed issue with the 3D view becoming blank (white) for a specific layout on macOS.
CX-89	Installer does not bundle Qt on Ubuntu	Ubuntu installation now bundles Qt and other libraries.
CX-135	Faulty setting of matrix input in manual registration	This fix changes the interpretation of the Image-to-image registration widget input fMm matrix to make CustusX compatible with external registration tools like Siemens Syngo workstation. If more than three landmarks are defined and in state "Active", the total Root Mean Square (RMS) accuracy for those landmarks will be calculated and indicated in GUI.
CX-192	Video grabbing is not working on Mac, update OpenCV	Fixed. However, it has been seen that tracking drivers might need to be reinstalled on Mac after installing grabbing drivers.
CX-212	Navigation inside a surface don't work	Backface and frontface culling is now turned off by default, because of VTK 7 changes.
CX-222	The contour filter crashes when it has no input	Fixed a crash when adjusting the threshold when there was no input volume selected.
CX-227	Segmentation fault in image2image registration	Segmentation fault in CustusX when using manual image2image registration widget. Bug only appeared when there was no registration history. Fixed.
CX-228	Volume Properties: Incorrect rMd display	Fixed display of rMd matrixes in volume and mesh properties info tab.
CX-231	Overlay and or shared context has errors on windows	The use 2D overlay option was not set default to on on Windows. Now it is.
CX-232	Color in 2D views are incorrectly initialised	Issue is only identified on Macs with NVIDIA GeForce GT 750M. This problem is now mentioned in the supported platforms help file.
CX-235	Show tool path don't work	Fixed show tool path after VTK upgrade changing PolyData behaviour.

CX-244	Wrong movement of manual tool when offset is set	Tool offset is no longer added to editable matrix in Tool Properties. Added help text to Tool Properties.
CX-245	The crosshair on the 3D manual tool is wrong with offset	Manual tool crosshair is now drawn in the correct position when offset is used
CX-257	Crash on DICOM import when character "%" is present in DICOM tag 0008.103e "Series Description"	Fixed CustusX crash when importing DICOM series with character "%" in Series Description.
CX-288	Wrong help text on the tool status bar.	The help text on the tools on the status bar when tracking was wrong. Visible tools were labled as not visible and vice verca.
CX-297	Manual Image2Image registration - Calculation of accuracy in landmarks	Manual Image-to-Image registration - Calculation of accuracy in landmarks also when fewer than three landmarks are defined.
CX-301	Corner metrics text not displayed	When using the Corner metrics setting in the preferences, the corner text would dissappear when changing between different layouts. It would also not be displayed at all when autoloading a patient in Windows. This has been fixed.
CX-316	Bronchoscopy image-to-image registration	Fixed bug in Bronchoscopy Image to Image Registration
CX-326	Mac installers of CustusX now only work for macOS High Sierra (10.13)	Mac installers are now compiled for macOS 10.11 (El Capitan) and above
CX-342	Crash during cropping and clipping	Fixed bug in VTK 7.1 causing crash when using volume cropper and clipping simultaneously in 2D/3D view.

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## v16.12

### New features

Key	Summary	Release Note
CX-118	Should be possible to turn on or off custom context menu for views.	Added functionality for turning context menu of views on and off for existing layouts.
CX-128	Integrate metric properties in browser widget	A new Browser widget has been created. It contains a list of objects in the patient and can be used to control camera views and set properties and so on.
CX-167	Implement Accusurf in CustusX	Implement Accusurf in CustusX. Simple version: One target only. 1. Read CT volume (.mhd) and route-to-target centerline (.vtk) 2. Input option: Accusurf thickness (number of voxels) 3. Generate new CT volume (.mhd): Accusurf
CX-170	Allow import of 32 bit PET volumes	Allowed import of 32 bit PET volumes
CX-172	Route-to-Target plugin: Extend route	Current route-to-target (RTT) terminates at the airway centerline position closest to the target. It is necessary to extend the route to the exact target position. The old RTT line should be kept as it is, and another extended line should be created. This line will be used as input to the Accusurf plugin.
CX-186	Create template patient system	Added an option in the menu to create a new patient from an old one. In this way you can have premade template patients.
CX-188	Add texturing to mesh	It is now possible to add a texture to a mesh in a rather primitive way.
CX-189	2D slice along tool fixed to gravity.	Created a new 2D plane, ToolSide, which is parallel with the tool axis and always oriented with gravity.

CX-190	Create Custom metric	A new Custom metric has been created. This metric improves the possibilities of custom geometric modelling. One can now set an imported mesh or image in a point with a direction. The custom metric has several other features as well.
CX-191	New concept: Operating table	CustusX needed a definition of a Table, oriented relative to the patient. The table orientation can be used to provide navigation relative to the surgeon in combination with camera settings.

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## Bugfixes

Key	Summary	Release Note
CX-37	Registration history	Store all registrations, if they are not explicitly marked as temporary.
CX-97	Import image from stream don't work for 3D probe	Fixed an obvious bug where the pointer to the vtkImageData containing the stream was used instead of the DeepCopied object from the original code.
CX-115	Playback don't show any tool movement	Fixed playback issue: only the last installed tracking system were wrapped in playback - now all systems are considered.
CX-124	Filter Tracking positions does not work	Fixed. Filter Tracking positions was not read properly: When changing the value in Properties GUI the filter is enabled. When starting the application with filter ON, nothing happened. Also added more GUI to set cutoff frequency.
CX-125	Tool offset not applied to tool during init	Fixed. The tool offset is a global property. When a tool is initialized, the global value was not applied to the tool.
CX-132	Handle crash in tool calibration	Handled a crash during tool calibration. The calibration matrix could also be corrupted and this has been handled.

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