HiSeq X Instrument Software Release Notes

HiSeq X Control Software v3.3.39

Real-Time Analysis (RTA) v2.7.1

Recipe Fragments v3.2.4

Microsoft .Net Framework 4.5.1

Sequencing Analysis Viewer (SAV) v1.10.2

BaseSpace Broker v2.5.2.28

Run Copy Service v1.0.16.0

For HiSeq X™ Systems

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Introduction

These Release Notes detail the key changes to instrument software components for the HiSeq X since the release of the previous HiSeq X Control Software (HCS) package. The previous release contained HCS v3.1.26, RTA v2.3.9, Recipe Fragments v3.0.8, SAV v1.8.46, and BaseSpace Broker v2.4.

If you are upgrading from an earlier version than HiSeq X Control Software v3.1.26, review the release notes for HCS v3.1.26. These release notes contain a list of features and bug fixes introduced in that version.

The software included in this release must be installed by Illumina service personnel. Before installing this software package, Illumina recommends upgrading the FPGA to v10.37.13 or later and the ARM9 firmware on the chemistry module board to v2.042. To update your FPGA version and ARM9 firmware, contact Illumina Technical Support. FPGA updates must be completed by trained Illumina service personnel.

The Recipe Fragments installation overwrites any custom recipe files. Therefore, recreate any custom recipes after receiving this update.

The BaseSpace Send Instrument Health data option is reset to “on” during this software installation. Update your BaseSpace Send Instrument Health settings after receiving this update.

The software package includes:

- HiSeq X Control Software v3.3.39
- Real-Time Analysis (RTA) v2.7.1
- Recipe Fragments v3.2.4
- Microsoft .Net Framework 4.5.1 – no change
- Sequencing Analysis Viewer (SAV) v1.10.2
- BaseSpace Broker v2.5.2.28
- Run Copy Service v1.0.16.0

I. HISEQ X CONTROL SOFTWARE v3.3.39

NEW FEATURES:

- Addition of LIMS communication
- Flow cell detilts performed on lanes 1 and 8 to improve % passing filter for those lanes (global flow cell detilts still used for lanes 2–7)
- Upgrade to version 2 ProClin Tween wash replacing NaOH based wash
    - Maintenance wash workflow updated to support only Tween 20 ProClin 300 wash solution, NaOH wash no longer supported
    - Reduction in the overall wash time and number user interventions
    - Wash efficacy equivalent or better to version 1 NaOH based wash
    - For workflow specifics, refer to HiSeq X System Guide

IMPROVEMENTS:

- Vacuum sensor and chiller door logic changed to ignore false positive sensor warnings
- Improved flow cell and chiller peltier communication and control
- Improvement to Auto-Center algorithm
- Increased focus robustness
- Reduced polling of InterOp files to one time per cycle to reduce stress on data drives
- HCS now only sends Instrument Health data to BaseSpace at the beginning and end of the run and not during the run
- Added dynamic X/Y drift correction to scan start position
- Updated disk space usage check to more accurately assess data output by cycle
- Gasket change prompted during 240-hour timer for maintenance wash

DEFECT REPAIRS:

- Changed how memory is allocated for camera retry events, correcting issues seen where the DCAM DLL attempts to access unallocated memory and then errors out causing HCS to crash
- Chiller condensation pump interval is now configurable

KNOWN ISSUES:

- Pausing an ongoing run to start a second flow cell might stop the flow cell that is running and the run cannot be resumed
    - To avoid a run stopping event, follow the workflow outlined in the HiSeq X System Guide
- Pressing the abort button to stop the run for a flow cell on one side during imaging puts the camera in an unknown state and stops the run for the flow cell on the other side
    - To recover from this issue, restart HCS
    - The sequencing runs for either flow cell cannot be resumed

II. RTA v2.7.1

IMPROVEMENTS:

- Changes made to perform fewer read/write operations on O: and S: drives
- Changes to decrease memory utilization

III. Recipe Fragments v3.2.4

NEW FEATURES:

- Added ReagentBarcodeMasks to fragments, changed the code to read it in
- In reagent barcode masks, changed all the 'GA' headers to 'HS'
- Moved the Maintenance Wash fragment to Tween wash
- Added HP12 barcode mask

DEFECT REPAIRS:

- None.

KNOWN ISSUES:

- None.

IV. Sequencing Analysis Viewer 1.10.2

NEW FEATURES:

- Added Zip My Run button to Summary tab
- Add non-indexed row to Summary tab table
- Added Minimum and Maximum contrast to imaging tab table
- Added folder drag & drop into RunFolder field
- Loading tab calculations on demand instead of all at once

IMPROVEMENTS:

- Change %Q30+ to exclude last cycle of read
- Change total yield to include only non-N PF base calls rather than taking number of PF reads and multiplying by number of cycles in read minus 1
- Change projected total yield to extrapolate from existing cycles
- Removed %NC from Corrected % and made separate column in imaging tab table
- Renamed Corrected % to % Base
- % Base and % No Call are calculated only from PF reads
- Analysis tab status shows a range of values for in progress runs
- All drop-down menus have the same look and feel now
- Dates in the Imaging tab are iso-8601 compliant

DEFECT REPAIRS:

- Clear data when current load has errors
- Removed outlier coloring in flow cell chart; however, outlier-tolerant scaling is still present
- Q-score distribution chart flips from GB to MB at 100 MB instead of 10 MB
- Fixed scatter plot Z-scaling

KNOWN ISSUES:

- Corrected intensities are 0 for most recent RTA versions

- Q-score histogram includes the last cycle of reads when calculating yields, while summary tab does not
- "Zip My Run" button takes a lot of memory to run

V. BaseSpace Broker 2.5.2.28

IMPROVEMENTS:

- Broker updated to ensure correct copy policy association with upload mode (Instrument Health, Run Monitoring, Storage & Analysis)
- Limited Broker thread count and resource utilization

DEFECT REPAIR:

- None

KNOWN ISSUES:

- None

VI. Microsoft .Net Framework 4.5.1

- No changes in this release.
- Microsoft .NET Framework 4.5.1 is a software utility developed by Microsoft, which is used by HiSeq X Control Software and RTA and which must be installed on the HiSeq X PC. Installation of .Net 4.5.1 is automatically included in the software suite installation process. For more information, go to:
    - Offline installer: www.microsoft.com/en-us/download/details.aspx?id=40779

VII. Run Copy Service v1.0.16.0

NEW FEATURES:

- New file copy user interface display indicating:
    - File copy in progress but network connection slow
    - Run Copy Service not running
    - Run Copy Service running but not copying
- Configurable value that defines the limit for the number of files that have not been copied