iontorrent

RELEASE NOTES

Torrent Suite™ Software 5.12 Release Notes

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Revision History

Revision	Date	Description
H.0	10 September 2021	Updates in Torrent Suite™ Software 5.12.3 for compatibility with new motherboard on Ion GeneStudio™ S5 sequencers, and to fix issues with the Apache Tomcat™ software service, the CSA plugin, and the pump on the Ion Chef™ Instrument.
G.0	1 September 2020	Updated fixed issue in Torrent Suite™ Software 5.12.2.
F.0	23 March 2020	Corrected package version numbers for 5.12.1.
E.0	27 February 2020	Updated fixed issues in Torrent Suite™ Software 5.12.1.
D.0	16 December 2019	Corrected package version numbers for 5.12.1.
C.0	31 October 2019	Updated release notes for Torrent Suite™ Software 5.12.1.
B.0	22 July 2019	Corrected package version numbers for 5.12.0.
A.0	25 June 2019	New release notes for Torrent Suite™ Software 5.12.0.

Torrent Suite™ Software 5.12.3 release

Software update to support Ion GeneStudio™ S5 sequencer motherboard

The release enables users to run Torrent Suite™ Software 5.12.3 with Ubuntu 18.04 operating system on newly manufactured Ion GeneStudio™ S5 sequencers. The original motherboard on the sequencers was discontinued and replaced. Contact your Field Service Engineer (FSE) to obtain this software release.

Fixed Issues in Torrent Suite™ Software 5.12.3

Correct the analysis time for Ion™ 550 chip on Ion GeneStudio™ Prime and S5 XL instruments
After the Ion Torrent Server was upgraded to Ubuntu 18.04, some customers noticed an increase in the time required for the analysis pipeline to complete for runs that used an Ion 550™ chip. This issue is fixed in Torrent Suite™ Software 5.12.3.

Status of Tomcat service displayed incorrectly

In Torrent Suite™ Software 5.12 the status of the Apache Tomcat® software service was displayed incorrectly. The status in the Services screen showed that Tomcat® software service was down, although the service was active. This issue is fixed in Torrent Suite™ Software 5.12.3.

CSA permission error is fixed on Ion Chef™ Instrument

An error 500 occurred when the CSA (Customer Support Archives) was downloaded. This issue is fixed in Torrent Suite™ Software 5.12.3. Users can now run the CSA plugin to generate the CSA file in Torrent Suite™ Software.

Pump issue on Ion Chef™ Instrument

An issue of excess aspiration was reported that was caused liquid to flow to the pump on an Ion Chef™ Instrument. A new script in the software corrects excess aspiration of the library preparation workflow with the 550 templating script on Ion Chef™ Instrument. This issue is fixed in Torrent Suite™ Software 5.12.3.

Fixed Issue in Torrent Suite™ Software 5.12.2

"Reagent Check Failed" message when initializing with the Ion 550™ chip fixed

When initializing instruments with the Ion 500™ chip, users saw a "Reagent Check Failed" error message. The issue is fixed in Torrent Suite™ Software 5.12.2.

Fixed Issues in Torrent Suite™ Software 5.12.1

variantCaller plugin reported same allele multiple times for a given variant

In rare cases, the variantCaller plugin, running in Torrent Suite™ Software 5.12 on the Ubuntu 18.04 operating system, produced variant calls with an alternate allele reported multiple times for a given variant. This caused incorrect generation of the output VCF file record resulting in the variantCaller

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plugin failing/skipping the corresponding sample, and generating a result table for the sample. The issue is fixed with the installation of the updated Suite™ Software 5.12.1.

Torrent Suite™ Virtual Machine (TSVM) reboot/stall during analysis on S5 sequencers

On some Ion S5™ and Ion GeneStudio™ S5 sequencers, Torrent Suite™ Software running on a virtual machine stalls or stalls and restarts during run analysis. In both cases the run does not complete and the user would need to manually start the reanalysis. This issue is fixed with the installation of Torrent Suite™ Software 5.12.1.

Basecalling input data deleted by scheduled Data Management auto action

On some systems, it was observed that the basecalling input data was deleted by data management's auto action when all results were older than the configured data management threshold. This issue is fixed with the installation of Torrent Suite™ Software 5.12.1. For more information on the configuration of the data management auto action, see the Torrent Suite™ Software help system.

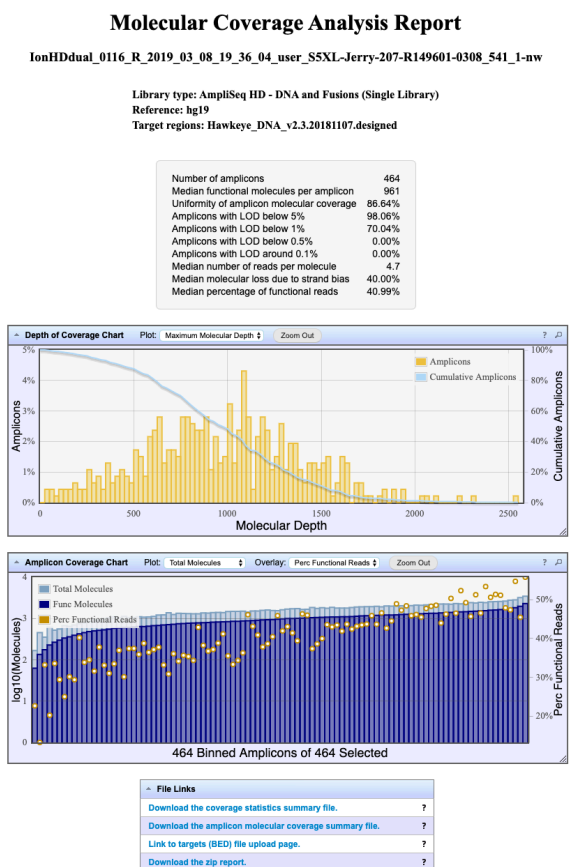# New features in Torrent Suite™ Software 5.12.0

Support added for new Ubuntu Operating System (OS)

With the release of Torrent Suite™ Software version 5.12.0, support is added for Ubuntu Operating System (OS) 18.04. Torrent Suite™ Software 5.12.0 also continues to be supported on and is available on the current version, Ubuntu OS 14.04. Therefore, you have the option to remain on the current OS version, upgrade to 18.04 now, or upgrade at a future date. No further security updates will be published by Ubuntu for the 14.04 version of the OS. To continue to receive security updates with future software updates, upgrading to Ubuntu OS 18.04 with Torrent Suite™ Software 5.12.0 is highly recommended. See section "Important Information" for additional details.

molecularCoverageAnalysis plugin launched

The new molecularCoverageAnalysis plugin provides coverage analysis, QC metrics and visual results that are specialized for the Ion AmpliSeq™ HD and Tag Sequencing chemistries. With the addition of this plugin that is dedicated to the coverage analysis, the variantCaller plugin has been modified to remove coverage related metrics to avoid duplication of information and confusion.

An example report from the molecularCoverageAnalysis plugin is as follows:

Molecular Coverage Analysis Report

IonHDdual_0116_R_2019_03_08_19_36_04_user_S5XL-Jerry-207-R149601-0308_541_1-nw

Library type: AmpliSeq HD - DNA and Fusions (Single Library)
Reference: hg19
Target regions: Hawkeye_DNA_v2.3.20181107.designed

Number of amplicons	464
Median functional molecules per amplicon	961
Uniformity of amplicon molecular coverage	86.64%
Amplicons with LOD below 5%	98.06%
Amplicons with LOD below 1%	70.04%
Amplicons with LOD below 0.5%	0.00%
Amplicons with LOD around 0.1%	0.00%
Median number of reads per molecule	4.7
Median molecular loss due to strand bias	40.00%
Median percentage of functional reads	40.99%

variantCaller plugin now allows specifying minimum callable probability parameter for Limit of Detection (LOD) calculation

For Tag Sequencing and AmpliSeq™ HD assays, the variantCaller plugin now allows users to specify the minimum detectable probability for the calculation of Limit Of Detection (LOD) using the "min_callable_prob" parameter. LOD is defined to be the lowest possible allele frequency in the sample, such that the variant is callable with probability higher than the "min_callable_prob" value, when molecular depth is given. In TSS 5.10, the default value of the "min_callable_prob" parameter was set to 0.98 for AmpliSeq™ HD and Tag Sequencing assays. In TS 5.12, the default values of "min_callable_prob" parameter is set to 0.95 and 0.8 for AmpliSeq™ HD and Tag Sequencing, respectively. As a result, the variantCaller plugin may report lower values for LOD in version 5.12 than 5.10, when analyzing the same dataset with the default parameters.

Access this parameter setting in the **Data** > **Completed Runs & Reports** screen. Click the report name link for the completed sequencing run, click **Plugins** > **Select Plugins to run**, select the variantCaller plugin, then click **Configure**. Adjust the parameter as appropriate.

min_callable_prob	0.95	• A reporting parameter (TagSeq/AmpliSeq HD only): The minimum callable probability for the calculation of Limit Of Detection (LOD). • Note that LOD is defined to be the lowest possible allele frequency in the sample such that the variant is callable with probability greater than this value, when the molecular depth is given. • Allowed values: Decimal numbers between (0, 1) • Suggested trial value 0.98
suppress_called_allele_lod	1	• A reporting parameter (TagSeq/AmpliSeq HD only): Suppress the LOD reporting of a variant allele that is called as present.

variantCaller plugin results view change

For Ion AmpliSeq™ HD applications, the Median Read Coverage and Median Molecular Coverage columns have been moved from the variantCaller plugin results view to the results view of the new molecularCoverageAnalysis plugin.

Sequence Variant Baseline (SVB) BED file support added

You can used advanced settings to point to path of the SVB BED file Use this setting to avoid unwanted interactions of hotspots with surrounding sequences, with variantCaller plugin is supported in Torrent Suite™ Software 5.10.0.

Access this parameter setting in the **Data** > **Completed Runs & Reports** screen. Click the report name link for the completed sequencing run, click **Plugins** > **Select Plugins to run,** select the variantCaller plugin, then click **Configure**. Adjust the parameter as appropriate."

Change to Limit of Detection for called alleles

For Ion AmpliSeq™ HD applications, the output VCF files from sequencing runs that use the default variantCaller settings now display in the Limit of Detection setting as "." for alleles reported as present.

Redesigned panel import, from Ampliseq.com, user flow for enhanced user experience

The Torrent Suite™ Software 5.12.0 user interface is redesigned to increase usability, present relevant information, and reflect the user experience of Ampliseq.com. In addition to improved layout of the panel information that is displayed, easy navigation and filtering capabilities are added to the panel import view.

Ampliseq.com Panels

On-Demand Panels	Made-to-Order Panels	Ready-to-Use Panels	Community Panels

| Search by Design name | Go | 🔬 Ampliseq | 🔬 AmpliseHD | 〰 DNA | ⠿ RNA | Recommended Application All ▾ | Clear All |

Design Name	Design ID	Nucleic acid type	Reference	Chemistry Type	Recommended Application	Status	
CA_PID_0912	IAD101614_241	〰 DNA	HG19	Ampliseq			Import
GRCh38_Uni_Smk_Tst	IAD108213_152	〰 DNA	GRCh38.p2	Ampliseq			Import
GRCh38_561_Smk_Tst	IAD108756_182	〰 DNA	GRCh38.p2	Ampliseq			Import
GRCh38_561_Smk_Tst	IAD108756_197	〰 DNA	GRCh38.p2	Ampliseq			Import
Fus_Unit_561_SMK_TST	IAD108758_001	⠿ RNA	HG19_RNA	Ampliseq			Import
RNA_Unit_561_SMK_TST	IAD108761_004	⠿ RNA	HG19_RNA	Ampliseq			Import
IAD111746_verf_2	IAD111792_197	〰 DNA	custom	Ampliseq			Import
GRCh38_SS_563_PRD	IAD116577_241	〰 DNA	GRCh38.p2	Ampliseq			Import
T_u_IAD62630	IAD116840_181	〰 DNA	HG19	Ampliseq			Import
Lin-10-28	IAD120649_167	〰 DNA	HG19	Ampliseq			Import

|◀ ◀ **1** 2 3 4 ▶ ▶| | 10 ▾ items per page | 1 - 10 of 31 items |

Support added for new telemetry service

A new telemetry service has been added to provide Torrent Suite™ Software with connectivity to Thermo Fisher Connect. This connectivity allows authorized Thermo Fisher Scientific personnel to provide remote troubleshooting service and support upon request.

To enable or disable these telemetry services, click ⚙ (Settings) > Services, then scroll down to the Telemetry Services section.

Telemetry Services Enabled

Service Name	Status
RSM_Launch	Running
deeplaser	Running

These services provide connectivity to Thermo Fisher Cloud and allow Thermo Fisher Scientific staff to perform remote troubleshooting on request. They also report anonymous usage statistics to Thermo Fisher Scientific. Disabling them will stop all Thermo Fisher Cloud integration and may make remote support more difficult.

Disable Telemetry

Barcode kit updated for Precision ID human identification (HID) templates

The Precision ID HID planned run templates that have been updated use IonCode™ as the barcode kit. The following templates were updated:

Templates	
Precision ID mtDNA Control Region Panel—S5	Precision ID mtDNA Control Region Panel—PGM
Precision ID mtDNA Whole Genome Panel—S5	Precision ID mtDNA Whole Genome Panel—PGM
Precision ID Ancestry Panel—S5	Precision ID Ancestry Panel—PGM
Precision ID Identity Panel—S5	Precision ID Identity Panel—PGM

System memory now displayed on System Services screen

The System Services screen now includes the display of system memory usage information at the bottom of the screen. This information helps with monitoring and troubleshooting.

To view the system memory usage, click ⚙ (Settings) > Services, then scroll to the **System Memory Usage** section.

System Memory Usage (last updated May 28, 2019, 10:49 a.m.) ↻

14.76 GB / 101.33 GB (14.57%)

Ion Chef™ Instrument added run calibration support and instructions to replace UV bulb

With the release of Torrent Suite™ Software 5.12.0, Ion Chef™ Instrument calibrations are now enabled for optional use by the customers. In addition to this feature release, instructions on how to replace the UV bulb in the Ion Chef™ Instrument are also made available to customers.

Fixed issues in 5.12.0

0variantCaller plugin UI displays incorrectly Torrent Variant Caller (TVC) version

On some systems, when off-cycle updates of Torrent Suite™ Software were installed, the TVC version displayed incorrectly in the variantCaller plugin user interface. This was a display issue only; the version of TVC used by the analysis pipeline was correct.

Centrifuge hardware failure event on Ion Chef™ Instrument causes runs to abort

On some systems, centrifuge failure events were observed at the end of the certain spins in the run protocol. The centrifuge failed to recover from the failure event, resulting in implicated runs to abort.

Truncated sample list in run report PDF

When a PDF of a run report is generated, the "Analysis Details" section might show a sample list that is truncated on a page if a large number of samples were used in a single run. This issue will be fixed in an upcoming release of the software.

Variant information in O-tags (OID, OPOS, OREF, OALT) of VCF off by 1 base

If padding is used when specifying alleles in a hotspot BED file, the reported variant information in the O-tags may be off by 1 base. This issue will be fixed in an upcoming release of the software.

Incorrect values listed in PPD and SPD tags in VCF file

In some cases, the values reported in the newly added PPD and SPD tags, for prefix and suffix paddings used for reported alternate alleles, can be incorrect in the VCF file from sequencing runs. Do not use the values until a fix is issued in an upcoming software update.

Deck scan fail on Ion Chef™ Instrument when empty tip rack is not detected

In some cases, the deck scan may fail and display the "Waste Tip Rack Not Found" message when an empty tip rack is present but is still not detected as present.
"Load check was unable to confirm the presence of all consumables and/or vision inspections, Press the Notifications button in the main menu for details."
If the empty tip rack is present, simply press the **Continue** button and proceed with the run. This issue will be fixed in an upcoming release of the software.

Important information in Torrent Suite™ Software 5.12.0 and higher release

Upgrading Ubuntu Operating System (OS)

The Torrent Suite™ Software 5.12.0 and higher release is available for all supported instruments on the current, 14.04, as well as the new, 18.04, versions of Ubuntu.

Ubuntu Upgrade to 18.04

Ubuntu is the operating system required for Torrent Suite™ Software, and after the end of support of version 14.04 in April 2019, there will no longer be new updates provided for that version of Ubuntu. However, we may continue to provide patch updates for the Torrent Suite™ Software 5.12.0 and higher as needed for critical issues/defects. To continue to receive new updates for the Ubuntu OS, upgrading to Ubuntu 18.04 is recommended.

Ubuntu Upgrade Options

Because Torrent Suite™ Software 5.12.0 and higher is available on both 14.04 and 18.04 versions of Ubuntu, it is possible to upgrade Torrent Suite™ Software to version 5.12.0 and higher without upgrading Ubuntu OS from 14.04 to 18.04.

IMPORTANT!   Torrent Suite™ Software 5.12.0 and higher will be the only Torrent Suite™ Software available on Ubuntu 18.04. Older versions of Torrent Suite™ Software are not supported on Ubuntu 18.04.

The following options are available for upgrading the Ubuntu OS:
1. Upgrade Service—On-site OS upgrade done by your local Field Service Engineer. Contact local service and support personnel to request the upgrade service.
2. Self-upgrade Kit—For performing the OS upgrade yourself.

Ion Torrent Platform	Upgrade options	Availability
Ion PGM™ System	Upgrade Service	June 2019
Ion Proton™ System Ion S5™ XL System Ion GeneStudio™ S5 Prime System	Self-upgrade Kit	December 2019
Ion S5™ System Ion GeneStudio™ S5 System Ion GeneStudio™ S5 Plus System	Upgrade Service Only [1]	December 2019

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[1] Due to the additional complexity involved in updating devices running TSS in a Virtual Machine, the self-upgrade option is not available for these systems.

Install the update for Torrent Suite™ Software 5.12.0 and later

IMPORTANT!   You cannot roll back to a previous version of Torrent Suite™ Software and Ion Torrent™ instrument software after you perform the upgrade described in this document.

IMPORTANT!   When updating Torrent Suite™ Software, it is critical that you update both the software on the instrument and the software on the Ion Torrent™ Server. In Torrent Suite™ Software 4.0 and later, the instrument will not retrieve the proper on-instrument analysis if both systems are not updated.

IMPORTANT!   During this upgrade, you must use the same user account for both the Ion Torrent™ Server and the Ion instruments (Ion PGM™ Instrument, Ion Chef™ Instrument, Ion Proton™ Sequencer, Ion GeneStudio™ Plus S5, Ion GeneStudio™ S5 Prime, and Ion S5™ and S5™ XL Sequencers).

Use these steps to install Torrent Suite™ Software 5.12.0.

1. Sign in to Torrent Suite™ Software as **ionadmin** user.

2. Click ⚙ **(Settings)** > **Services**. Ensure that there are no active jobs running.

3. Click ⚙ **(Settings)** > **Configure** > **Admin Interface**.

4. Click **Update Server**.

5. Click **Check** to check for updates.

6. When the **Available** message appears, click **Update Server** to start the update process.

7. On the EULA screen, scroll down to read, then accept the EULA to begin update.

8. When finished, ensure that the "**Upgrade completed successfully!**" message appears.

Updates through a command-line user interface

Note: This procedure is typically performed by Thermo Fisher Scientific field service engineers. Most users will instead use the procedure above for updates through the Torrent Suite™ Software.

New in this release, for Ubuntu™ 14.04 systems, the command-line interface update procedure has an additional TSconfig step of TSconfig --configure-server. The complete command-line interface update procedure is:

1 sudo apt-get update
2 sudo apt-get install ion-tsconfig
3 When prompted to accept EULA acceptance, press "Tab", then "Return" to proceed with update.
4 sudo TSconfig -s
5 sudo TSconfig --configure-server

Verify the software update on the Ion Torrent™ Server

To verify that the Ion Torrent™ Server is running Torrent Suite™ Software 5.12.1, click ⚙ **(Settings) > About** in the Torrent Suite™ Software and review the version number.

Update the instrument software

Update the software on any Ion instruments in use:

- Ion Proton™ Sequencer

- Ion GeneStudio™ S5 Sequencer

- Ion S5™ and S5™ XL Sequencer

- Ion Chef™ Instrument

- Ion OneTouch™ 2 Instrument

Package and version information

Release Date	September 2021
Release Version	5.12.3

Software packages versions in 5.12.3

These tables list the versions for each of the latest software packages for Torrent Suite™ Software plugins and Ion Torrent™ instruments.

Package	Version
ion-analysis	5.12.28-1
ion-dbreports	5.12.63-1
Ion-djang0	5.12.0-1
ion-gpu	5.12.2-1
ion-pipeline	5.12.21-1
ion-plugins	5.12.15-1
ion-publishers	5.12.2-1
ion-rsmts	5.12.6-1
ion-torrentpy	5.12.22-1
ion-torrentr	5.12.24-1
ion-tsconfig	5.12.26-1
Plugin	**Version**
ion-plugin-ampliseqrna	5.12.0.1
ion-plugin-assemblerspades	5.12.0.0
ion-plugin-coverageanalysis	5.12.0.0
ion-plugin-dataexport	5.12.0.0
ion-plugin-erccanalysis	5.12.0.0
ion-plugin-fieldsupport	5.12.0.2
ion-plugin-fileexporter	5.12.0.0

Package	Version
ion-plugin-filterduplicates	5.12.0.0
ion-plugin-immuneresponserna	5.12.0.1
ion-plugin-ionreporteruploader	5.12.0.40
ion-plugin-molecularcoverageanalysis	5.12.0.32
ion-plugin-pgxanalysis	5.12.0.0
ion-plugin-runtransfer	5.12.0.0
ion-plugin-sampleid	5.12.0.0
ion-plugin-variantcaller	5.12.0.4

Ion Chef™ Instrument Control Software in 5.12.3

Package	Version
ion-chefupdates	5.12.5
Package	Version
GUI	120011
IS	000906
SC	000906
GM	000023
OS	000061
TsLINK	6.0.6

Ion GeneStudio™ S5/Ion S5™ Instrument Control Software in 5.12.3

Update Package	Version
ion-s5updates	5.12.6
Package for Ubuntu 18.04 Operating System	**Version**
Scripts	020146
RaptorScripts	000131
RsmAgent	40
RfidMgr	000034
OIA	051231
LiveView	2762
Graphics	134
DataCollect	3970
Package for Ubuntu 14.04 Operating System	**Version**
Scripts	020142
RaptorScripts	000131
RsmAgent	40
RfidMgr	000034
OS	35
OIA	051231
LiveView	2762
Graphics	134
DataCollect	3970

Ion Proton™ Instrument Control Software in 5.12.3

Update Package	Version
ion-protonupdates_5.12.0_amd64.deb	5.12.0
Package	**Version**

Update Package	Version
datacollect	3738
Graphics	134
LiveView	2514
OIA	51206
OS	35
rsmagent	40
Scripts	2.1.46

Ion PGM™ Instrument Control Software in 5.12.3

Update Package	Version
ion-pgmupdates	5.10.0
Package	Version
LiveView	755
DataCollect	489
HW8560	134
Scripts	220000
OS	21
Graphics	36
TSLink	1.0.5

Ion OneTouch™ Instrument Control Software in 5.12.3

Update Package	Version
Ion-onetouchupdater	5.0.2-1
Package	Version
OneTouch	803
BoardControl	800
UpdateAgent	800

Update Package	Version
Ion-onetouchupdater	5.0.2-1
Package	**Version**
Scripts	802
Psplash	800