

# Local Run Manager v2

## Software Guide



This document and its contents are proprietary to Illumina, Inc. and its affiliates ("Illumina"), and are intended solely for the contractual use of its customer in connection with the use of the product(s) described herein and for no other purpose. This document and its contents shall not be used or distributed for any other purpose and/or otherwise communicated, disclosed, or reproduced in any way whatsoever without the prior written consent of Illumina. Illumina does not convey any license under its patent, trademark, copyright, or common-law rights nor similar rights of any third parties by this document.

The instructions in this document must be strictly and explicitly followed by qualified and properly trained personnel in order to ensure the proper and safe use of the product(s) described herein. All of the contents of this document must be fully read and understood prior to using such product(s).

**FAILURE TO COMPLETELY READ AND EXPLICITLY FOLLOW ALL OF THE INSTRUCTIONS CONTAINED HEREIN MAY RESULT IN DAMAGE TO THE PRODUCT(S), INJURY TO PERSONS, INCLUDING TO USERS OR OTHERS, AND DAMAGE TO OTHER PROPERTY, AND WILL VOID ANY WARRANTY APPLICABLE TO THE PRODUCT(S).**

**ILLUMINA DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE IMPROPER USE OF THE PRODUCT(S) DESCRIBED HEREIN (INCLUDING PARTS THEREOF OR SOFTWARE).**

© 2019 Illumina, Inc. All rights reserved.

All trademarks are the property of Illumina, Inc. or their respective owners. For specific trademark information, see [www.illumina.com/company/legal.html](http://www.illumina.com/company/legal.html).

## Revision History

Document	Date	Description of Change
Document # 1000000002702 v08	November 2020	Added to the Library Prep Kits to include the Rapid kit.
Document # 1000000002702 v07	January 2020	Updated service accounts user name and password requirements to reflect the switch of all instruments to Windows 10.
Document # 1000000002702 v06	June 2019	Updated service accounts user name and password requirements for instruments that run Windows 10. Added examples of UNC network output paths. Updated the color of the locked runs icon from red to gray.
Document # 1000000002702 v05	December 2018	Updated software descriptions for Local Run Manager v2,2 and includes the following updates: <ul style="list-style-type: none"> <li>• Updated URLs to view Local Run Manager.</li> <li>• Updated supported Chromium version to 64.0.3828.140.</li> <li>• Updated automatic deletion parameter setting procedure.</li> <li>• Updated sample sheet import and export information to clarify that sample sheets contain run information in addition to sample information.</li> <li>• Updated reference genome file path.</li> </ul> Added Certificates tab information to System Settings. Added browser refresh step to module installation procedure.
Document # 1000000002702 v04	April 2018	<ul style="list-style-type: none"> <li>• Updated software descriptions.</li> <li>• Added i5 index sequence instruction when creating custom prep kit sample sheets for use on the iSeq, MiniSeq, and NextSeq systems.</li> </ul>

Document	Date	Description of Change
Document # 1000000002702 v03	January 2018	<p>Updated software descriptions for Local Run Manager v1.6.0, which includes instructions for the following tasks:</p> <ul style="list-style-type: none"> <li>• Create a custom library prep kit definition file.</li> <li>• View on-screen help.</li> </ul> <p>Added Off-instrument installation instructions and related workflow procedures.</p> <p>Updated information in the following sections:</p> <ul style="list-style-type: none"> <li>• Computing and software requirements</li> <li>• Workflow overview</li> <li>• User management</li> </ul>
Document # 1000000002702 v02	September 2016	<p>Updated software descriptions for Local Run Manager v1.3.1, which includes instructions for the following tasks:</p> <ul style="list-style-type: none"> <li>• Disable password expiration.</li> <li>• Import a run.</li> <li>• Specify a network server.</li> <li>• Delete a library prep kit.</li> <li>• Import a reference genome.</li> </ul> <p>Replaced Total Reads, a section of the Overview tab, with Total Clusters.</p> <p>Specified 20 as the maximum number of custom sample library prep kits allowed per module.</p> <p>Corrected the name of the supported module TSAWorkflow to AmpliconWorkflow.</p>

Document	Date	Description of Change
Document # 1000000002702 v01	February 2016	Added the following information: <ul style="list-style-type: none"> <li>• User accounts and passwords are specific to an instrument.</li> <li>• Only a single instance of the software can be installed on an instrument.</li> </ul> Updated system maintenance instructions to specify a location for database backups other than on the instrument computer. Updated instructions for creating a custom library kit and added information about downloading example definition files from the Local Run Manager support page on the Illumina website.
Document # 1000000002702 v00	January 2016	Initial release.

# Table of Contents

Revision History .....	iii
<b>Local Run Manager Overview .....</b>	<b>1</b>
Analysis Modules .....	1
Viewing Local Run Manager .....	1
Sequencing During Analysis .....	2
<b>Installation .....</b>	<b>2</b>
Requirements .....	2
Computing Requirements .....	2
Software Requirements .....	2
Dependencies Installed by Local Run Manager .....	2
Install Local Run Manager .....	3
Change System Language Settings .....	3
Change User Account for Local Run Manager Analysis Service .....	3
<b>User Passwords .....</b>	<b>4</b>
My Account .....	4
Password States .....	4
Reset Your Password .....	5
Disable Password Expiration .....	5
<b>Dashboard Overview .....</b>	<b>5</b>
Active Runs Page .....	6
Filter Runs .....	6
Hide and Restore Runs .....	6
Delete a Run Folder .....	7
Relink a Run Folder .....	7
Search for Runs or Samples .....	7
Edit a Run .....	8
Import a Run .....	8
Stop Analysis .....	8
Requeue Analysis .....	9
Requeue Analysis from Active Runs .....	9
Requeue Analysis from Results Page .....	9
Change the Output Run Path .....	9

View On-Screen Help .....	10
Local Run Manager Icons .....	10
<b>Administrative Settings and Tasks .....</b>	<b>11</b>
User Management .....	11
User Permissions .....	11
Create a New User .....	12
Reset User Password .....	12
Unlock User .....	13
Change User Permissions .....	13
Disable a User .....	13
System Settings .....	13
Specify System Security Settings .....	14
Specify System Maintenance Settings .....	14
Specify Service Account Settings .....	15
Specify Reference Genome Repository Path .....	15
Specify Certificates .....	15
Change the Network Output Path .....	17
Modules & Manifests .....	17
Add Manifest Files to an Analysis Module .....	18
Export a Manifest File .....	18
Delete a Manifest File .....	18
Audit Trails .....	18
Filter Audit Trails .....	19
Export Audit Trails .....	20
Library Prep Kits .....	20
Create a Custom Library Prep Kit Definition File .....	20
Add a Library Prep Kit .....	22
Delete a Library Prep Kit .....	23
<b>Workflow Overview .....</b>	<b>23</b>
Local Run Manager Workflow .....	23
Set Parameters Overview .....	23
Run Name and Description .....	24
Run Settings .....	24
Module-Specific Settings .....	24
Samples Section .....	24
View Analysis Results Overview .....	26
Run Overview Tab .....	26

Sequencing Information Tab .....	27
Samples & Results Tab .....	28
Possible Run States .....	28
<b>Analysis Module Updates .....</b>	<b>29</b>
Install or Update Analysis Modules .....	29
Uninstall Local Run Manager .....	29
<b>Technical Assistance .....</b>	<b>31</b>



# Local Run Manager Overview

The Local Run Manager software is an integrated solution for recording samples for a run, specifying run parameters, monitoring status, analyzing sequencing data, and viewing results.

Local Run Manager has the following features:

- Integrates with the instrument control software when run on the instrument computer.
- Records samples and input files, such as manifests and reference genomes.
- Provides a run setup interface specific to the selected analysis module.
- Performs data analysis on completed sequencing runs.
- Performs a series of analysis steps specific to the selected analysis module.
- Shows analysis metrics upon completion of analysis.

Only a single instance of Local Run Manager can be installed on the computer.

## Analysis Modules

The Local Run Manager software uses different analysis modules to perform data analysis. Each module has a specific set of procedures appropriate for an application and library type. For a description of each analysis module, see the [Local Run Manager support page](#) on the Illumina® website.

The Local Run Manager software does not include any preinstalled analysis modules. Each analysis module, and the off-instrument version of Local Run Manager, must be downloaded and installed on your system separate from Local Run Manager. Not all modules can be used with the off-instrument version of Local Run Manager. For more information on installing an analysis module, see the Local Run Manager Workflow Guide specific to that module.

## Viewing Local Run Manager

The Local Run Manager interface is viewed through a web browser. Open a web browser on a computer with access to the same network as the instrument and connect using either of the following methods:

- On a local network, connect using the instrument IP address or instrument name. For example, **https://myinstrument**.
- To view the Local Run Manager interface on the instrument monitor, open a web browser and enter **https://localhost** in the address bar.
- To best view the Local Run Manager interface on a computer separate from the instrument, make sure that the zoom setting on your browser is set to 100%.
- To access the instrument remotely, port 80 must be **open**.

## Sequencing During Analysis

The instrument computing resources are dedicated to either sequencing or analysis.

If a new sequencing run is started before secondary analysis of an earlier run is complete, a confirmation dialog box appears. After confirming you want the new sequencing run to start, Local Run Manager stops secondary analysis of the earlier run until the new run completes sequencing.

After the new run completes sequencing, secondary analysis of the earlier run automatically starts again from the beginning.

## Installation

The instructions included in this section only apply to the off-instrument installation of Local Run Manager. For software issues on your Illumina instrument, refer to the system guide for your instrument.

## Requirements

To use the **off-instrument** implementation of Local Run Manager, your computer must meet the following requirements.

### Computing Requirements

- Minimum 16 GB RAM
- Minimum 1 TB disk space
- 64-bit quad core processor (2.8 GHz or higher) with the AVX instruction set (recommended) or Intel Core i7-210QE 2.10 GHz (or equivalent) processor with the AVX instruction set (minimum)

### Software Requirements

- Windows 7 Pro 64-bit with Service Pack 1 (English-US) or Windows 10 (Personal Edition versions are not supported)—For more information, see [Change System Language Settings on page 3](#)
- Microsoft .NET 4.5.2 or later
- Google Chrome 46.0.2490 or later (Recommended), Chromium 64.0.3828.140 (Optional), or Firefox
- Internet Information Services

## Dependencies Installed by Local Run Manager

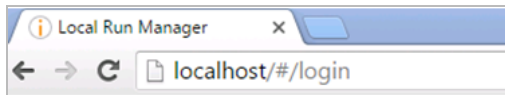
If any of the following components are already present on your system, installation may fail.

- PostgreSQL 9.3
- Rabbitmq 3.5.1
- Erlang/OTP 17
- C++ 2012 64-bit Redistributable
- C++ 2013 64-bit Redistributable
- C++ 2015 64-bit Redistributable
- Illumina Run Copy Service (applicable to off-instrument installations and MiSeq systems)
- Internet Information Services
- Local Run Manager

## Install Local Run Manager

1. Right-click OffInstrument\_Research\_(version).exe and select **Run as administrator**.
2. Select **Install**.
3. When installation is complete, select **Close**.
4. To make sure the installation was successful, open your browser.
5. Browse to **localhost/#/login**.

Figure 1 Browser Address Bar



6. After installation, restart the system.  
Depending on your system configuration, the system may restart during installation.
7. Open Local Run Manager, and change the default user name and password.  
For more information, see [Reset Your Password on page 5](#).

## Change System Language Settings

To use Local Run Manager, the system language must be set to English (United States). To change the system language settings for your system, see the reference guide for your operating system.


## Change User Account for Local Run Manager Analysis Service

These instructions apply to Local Run Manager installations on Windows 7 and Windows 10. To change the user account for Local Run Manager Analysis Service on other operating system versions, see the reference guide for your operating system.

1. From Run, open **services.msc**.
2. Right-click **Illumina Local Run Manager Analysis Service** and select **Properties**.
3. In the Log On tab, select **This account**.
4. Enter the user name and password for the logged in user.
5. Select **OK**.
6. Right-click **Illumina Local Run Manager Analysis Service** and select **Restart**.

## User Passwords

The user management option, which requires password verification to use Local Run Manager, is disabled by default. But if your system is secured with this option enabled, you need a valid user name and password to log in to the system. Only an admin user can assign user credentials.

 | User accounts are specific to an instrument. User passwords are not universal across multiple instruments.

A message appears at the top of the interface to remind you to reset your password when it has expired.

## My Account

You can reset your existing password at any time using the My Account window. From My Account, you can view your user name, assigned role, and permissions.

To change your password, you must know your current password. If you forget your password, an Admin can reassign a temporary password so you can update your password.

## Password States

The following are possible password states:

- **Temporary password**—When an Admin creates a user account, the Admin assigns a temporary password for the new user.
- **User password**—Upon first access, a new user is prompted to change the temporary password from the login screen to a user-assigned password.
- **Forgotten password**—If a user forgets a password, an Admin can reassign a temporary password that can be changed upon next access.
- **Used password**—Any user cannot reuse a password for up to five password cycles.
- **User lockout**—An Admin can change the limit for number of attempts to log in using an invalid password. The default is 5. If a user exceeds the number of allowed attempts, the user account is locked. Only an Admin can unlock the account, or assign a temporary password.

## Reset Your Password

Follow the steps below to reset a password.

1. From the navigation bar, select the **User** icon next to your name.
2. From the drop-down list, select **My Account**.
3. In the Password section, select **Edit**.
4. In the Old Password field, enter your old password.
5. In the New Password field, enter a new password.
6. In the Confirm New Password field, reenter your new password.
7. Select **Save**.

## Disable Password Expiration

Follow the steps below to disable expiration dates for passwords.

1. From the navigation bar, select the Tools drop-down list and then select **System Settings**.
2. Select the Security tab.
3. Under Password Expiration, clear the **Disable password expiration** checkbox.

## Dashboard Overview

When you log in to the Local Run Manager software, the dashboard opens. From the dashboard, you can perform the following tasks:

- Track sequencing and analysis status
- Sort and filter runs
- Create and edit runs
- Hide runs
- Import runs
- Stop or requeue analysis
- View analysis status
- Manage run folder

The dashboard lists all runs performed on the instrument, 10 runs per page. Use the navigation arrows at the bottom of the list to scroll through pages.

Each run listed includes the run name, analysis module, run status, and the date that the run was last modified.

- **Run Name/ID**—Lists the assigned run name and links to the run results pages. The Run ID is added to the run name column at the start of sequencing or analysis.

- **Module**—Lists the analysis module assigned to the run.
- **Status**—Lists the status of the run and includes a progress status bar. For more information, see *Possible Run States on page 28*.
- **Last Modified**—Lists the date and time that a run or analysis session was last modified. By default, the Active Runs page is sorted by this column.

To sort the run list, select any column heading to sort in ascending or descending order.

## Active Runs Page

The dashboard opens on the Active Runs page by default. At the top of the Active Runs page, a summary of active runs provides a count of runs in each of the following run status categories.

- **Ready**—Indicates that the run is ready for sequencing or importing.
- **In Progress**—Indicates that the run is in the process of sequencing or data analysis, or in the process of stopping after a manual stop command.
- **Stopped or Unsuccessful**—Indicates that analysis was stopped manually or that analysis was unsuccessful.
- **Complete**—Indicates that analysis was successfully completed.
- **Total**—The total number of runs on the Active Runs page.

## Filter Runs

1. Select a run status category in the summary of active runs to filter the Active Runs page as follows.
  - **Ready**—Filters the list to show only runs that are ready for sequencing.
  - **In Progress**—Filters the list to show only runs that are in progress.
  - **Stopped or Unsuccessful**—Filters the list to show only runs that were stopped or unsuccessful.
  - **Complete**—Filters the list to show only runs that are complete.
  - **Total**—Removes filters and shows all active runs.

## Hide and Restore Runs

1. From the Active Runs page, select **Actions** next to the run name that you want to hide.
2. Select **Hide**.
3. When prompted to confirm the move, select **Hide**.
4. To show the Hidden Runs page, select the Active Runs drop-down arrow and select **Hidden Runs**.
5. To restore a run to the Active Runs page, select **Actions** next to the run name that you want to restore.
6. Select **Restore**.

7. When prompted to confirm the move, select **Restore**.
8. To show the Active Runs page, select the Hidden Runs drop-down arrow and select **Active Runs**.

## Delete a Run Folder

You can manually delete run folders to manage storage space. To delete a run folder, the run must be in one of the following states:

- Sequencing Complete
  - Primary Analysis Complete
  - Primary Analysis Unsuccessful
  - Sequencing Errored
  - Analysis Errored
  - Analysis Complete
  - Sequencing Stopped
  - Analysis Stopped
1. From the Active Runs page, select **Actions** next to the run name that you want to delete.
  2. Select **Delete Run Folder**.  
The **Delete Run Folder** option is replaced with **Relink**. A trash bin icon appears on the run.

## Relink a Run Folder

Only Administrators can relink deleted run folders.

1. Copy the run folder back to its original location.  
If the run is not saved in its original location, the software displays an error message following an attempt to restore.
2. Select **Actions** next to the run.
3. Select **Relink Run Folder**.
4. Select **Confirm** to proceed and relink the run.  
The run is restored to the state it was in before the run folder was deleted.

## Search for Runs or Samples

1. From the navigation bar, select the Search icon.  
Searches can only be performed on active runs.
2. In the search field, enter a run name or sample ID.  
As you type, a list of possible matches appears to assist your search.
3. Select a match from the list or press **Enter**.

- If you entered a run name in the search field, the Run Overview tab opens.
- If you entered a sample ID in the search field, the Samples & Results tab opens.

For more information, see [View Analysis Results Overview on page 26](#).

## Edit a Run

1. From the Active Runs page, select **Actions** next to the run name that you want to edit.
2. Select **Edit**.
3. When prompted to confirm the action, select **Continue**.
4. Edit run parameters as needed.
5. When finished, select **Save Run**.

The Last Modified date for the run is updated on the Active Runs page.

## Import a Run

1. From the Active Runs page, select **Create Run**.
2. Set the parameters for the run. For more information, see the workflow guide for the analysis module.
3. Select **Save Run**.
4. From the Active Runs page, select **Actions** next to the newly created run.
5. Select **Import**.
6. Enter the run folder path of the run that you want to import.  
Runs imported from network locations may take longer to analyze than runs imported from a local drive.
7. Select **Import Run**.  
Analysis starts immediately.

## Stop Analysis

1. From the Active Runs page, select **Actions** next to the run name that you want to stop.
2. Select **Stop Analysis**.  
The Stop Analysis command appears for runs that are either in the state of Analysis Queued or Analysis Running.
3. When prompted to confirm, select **Stop Analysis**.



## Requeue Analysis

You might requeue analysis if analysis was stopped, if analysis was unsuccessful, or if you want to reanalyze a run with different settings. You can requeue analysis from the dashboard or from the analysis results screen.

### Requeue Analysis from Active Runs

1. From the Active Runs page, select **Actions** next to the run name that you want to requeue.
2. Select **Requeue**.
3. When prompted, select from the following options:
  - Select **Edit Setup** to change analysis parameters. From the Requeue Analysis page, change preferred settings, and then select **Requeue Analysis**.
  - Select **Requeue**. Analysis begins using current analysis parameters.

### Requeue Analysis from Results Page

1. Select the run name on the Active Runs page.
2. Select **Requeue Analysis**.
3. When prompted, select from the following options:
  - Select **Edit Setup** to change analysis parameters. From the Requeue Analysis page, change preferred settings, and then select **Requeue Analysis**.
  - Select **Requeue**. Analysis begins using current analysis parameters.

## Change the Output Run Path

You can change the location of the output run folder when a run finishes. This is useful when you want to requeue a run and save the output to a new folder.











1. From the Run Dashboard, filter the run list to show the completed runs by selecting **Completed**.
2. Select the run that you want to edit.  
Make sure that the selected run is not in progress or the output run folder cannot be changed.
3. Select the Run Overview tab.
4. From the Output Run Folder section, select **Edit**.
5. Enter a new path in the Output Run Folder field and select **Save**.  
You can only edit the path to the output folder, the output folder name remains the same.

## View On-Screen Help

Each page provides help to guide you through the available options on the screen. From the navigation bar, select **Help** for information on the possible choices.

## Local Run Manager Icons

The following icons are used in Local Run Manager to perform various tasks.

Icon	Name	Description
	Copy to clipboard	Copies a field to the computer clipboard.
	Edit	Enables editing of run parameters.
	Export	Command to export items from the dashboard.
	Help	Opens on- screen help.
	Hide	Moves a run from the active runs page to the hidden runs page.
	Restore	Moves a run from the hidden runs page to the active runs page.
	Requeue	Restarts analysis of the selected run.
	Search	Opens the search field to search run names and sample IDs.
	User	Opens the user account menu.
	Locked	Indicates that the run is being sequenced or another user is editing a run in another browser session.

## Administrative Settings and Tasks

The following settings and tasks are available from the Tools drop-down menu:

Tool	Description	Role Permission
Audit Trails	Monitors access frequency and user activity.	Admin
Library Prep Kits	Allows the addition of custom library prep kits. For more information, see <a href="#">Library Prep Kits on page 20</a> .	User*
Modules & Manifests	Allows upload of manifest files for use with all runs using a specific analysis module.	User*
System Settings	Sets system security parameters and maintenance intervals.	Admin
User Management	Adds users, assigns permissions, and sets passwords.	Admin

\* Available on a per user basis

## User Management

All user accounts are listed on the User Management page, which includes the first name, last name, and user name for each account. This setting is turned off by default.

**i** | User accounts are specific to an instrument. User passwords are not universal across multiple instruments.

Within the details of each account, the role and associated permissions are managed. Two roles are possible, either Admin or User.

- **Admin role**—Admin roles have full permissions, by default.
- **User role**—User roles are configurable based on a subset of possible permissions. All users can create runs regardless of permission settings.

Only an admin user can view the User Management page.

## User Permissions

Permission	Description	Admin Role	User Role
Manage User Accounts	Create and edit user accounts.	Allowed	Not allowed

Permission	Description	Admin Role	User Role
Edit Local Run Manager System Settings	Set security and maintenance settings.	Allowed	Not allowed
Upload Site Certificate	Add custom HTTPS certificate for LRM.	Allowed	Not allowed
Relink Run Folder	Restore deleted run data back to a run.	Allowed	Not allowed
View Audit Trails	View, filter, and export audit trails.	Allowed	Not allowed
Requeue Analysis	Reanalyze runs; edit analysis parameters.	Allowed	Optional
Edit Module Settings	Upload manifest files for analysis modules.	Allowed	Optional
Manage Library Prep Kits	Create a custom library kit definition.	Allowed	Optional

## Create a New User

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **User Management**.
2. From the User Management page, select **Create User**.
3. In the Create New User dialog box, enter the first and last name of the new user.
4. In the User Name field, enter a user name.  
User names must be unique and cannot be reused or changed.
5. In the Password field, enter a temporary password.  
Temporary passwords are not stored in the password history and can be reused.
6. In the Confirm Password field, reenter the temporary password.
7. To select a role, select **Admin** or **User** to toggle between options.
8. Select user permissions based on the specified user role.
9. Select **Create User**.

## Reset User Password

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **User Management**.
2. Locate the user name you want to edit, and select **Edit**.
3. In the New Password field, enter a temporary password.  
Temporary passwords are not stored in the password history and can be reused.

4. In the Confirm Password field, reenter the temporary password.
5. Select **Update User**.

## Unlock User

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **User Management**.
2. Locate the user name you want to edit, and select **Edit**.
3. From the Edit User dialog box, select **Unlock User**.
4. In the New Password field, enter a temporary password.
5. In the Confirm Password field, reenter the temporary password.
6. Select **Update User**.

## Change User Permissions

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **User Management**.
2. Locate the user name you want to edit, and select **Edit**.
3. To change a role, select **Admin** or **User** to toggle between options.
4. Select user permissions based on the specified user role.
5. Select **Update User**.

## Disable a User

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **User Management**.
2. Locate the user name you want to edit, and select **Edit**.
3. In the Edit User dialog box, select **Disable User**.
4. When prompted to disable the user, select **Disable**.

## System Settings

System settings are global parameters for user security, automated data maintenance, service accounts, reference genome repository assignment, and program certificates.

- System security settings include duration for password expiration, maximum login attempts, and duration for idle timeout. Available when User Management is enabled.
- System maintenance includes automatic cleanup of inactive run folders, database backup frequency, and a command for immediate database backup.

- Service account settings include changing user accounts for data analysis, performing backups, and data storage.
- Assign the reference genome repository location.
- Manage Local Run Manager certificates.
- Change the network output path.

Only an admin user can view the System Settings page.

## Specify System Security Settings

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **System Settings**.
2. Select the Security tab.
3. From the Password Expiration section, specify the number of days before a password expires and has to be reset or select the **Disable password expiration** checkbox.
4. Specify the number of days that a user is reminded to reset a password before it expires.
5. From the User Lockout section, specify the maximum number of attempts that the user can enter invalid login credentials before being locked out of the system.
6. From the Auto Logout section, specify the number of minutes that the system can remain idle before the user is automatically logged out.
7. Select **Save**.

## Specify System Maintenance Settings

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **System Settings**.
2. Select the Maintenance tab.
3. **[Optional]** Select the **Enable Automatic Deletion** checkbox to enable automatic removal of older analysis files.  
When enabled, the system keeps recent analysis information and deletes all other temp files to improve performance.
4. If the Enable Automatic Deletion checkbox is selected, specify the automatic deletion trigger. This parameter varies by instrument and is specified as one of the following:
  - Folder inactivity (in days)
  - Folders to keep
5. Enter a preferred path to a backup location other than on the local instrument computer, such as a network location or on another networked computer.
6. In the Backup Period field, enter the duration in days between each backup.
7. To create an immediate backup, select **Backup Now**.

8. Select **Save**.

## Specify Service Account Settings

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **System Settings**.
2. Select the Service Accounts tab.
3. To enable and set the credentials for Analysis Service, Job Service, and Universal Copy Service, select Windows Account.

**i** | Make sure that the service account you choose has permission to read and write to the output run folder.

4. In the User Name field, enter a user name.  
For instruments that run Windows 10 with a local account, include .\ in the user name (. \username). For domain users, include the domain name, then a backslash in the user name (domain \username).
5. In the Password field, enter a password.  
For instruments that run Windows 10, the operating system requires a Windows password change every 180 days. Make sure to update the Windows Account in Local Run Manager with the same password as the Windows operating system.
6. Select **Save**.

## Specify Reference Genome Repository Path

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **System Settings**.
2. Select the System Configuration tab.
3. Enter the path of the reference genome repository.  
The repository must be on a local or network folder. Access to online repositories is not supported. You can also select **Set to Default** to reset the path to C:\Illumina\Genomes.
4. Select **Save**.

## Specify Certificates

Local Run Manager uses HTTPS to encrypt data connections to make sure that run data information is private and secure. Security certificate settings should only be changed in the following situations:

- Access Local Run Manager from a new remote device
- Use your own custom security certificate

- Regain access to Local Run Manager after changing the system name or moving the system to a new domain

## Install a Security Certificate For Remote Access

1. On the remote device, login to Local Run Manager.
2. From the dashboard navigation bar, select the Tools drop-down list, and then select **System Settings**.
3. Select the Certificates tab.
4. Select **Download** to download a zip file that contains the Local Run Manager certificate.
5. Extract the contents of the zip file.
6. Right-click the BAT file and select **Run as administrator**.
7. Follow the prompts to finish the installation, and then restart your browser.

## Upload a Custom Security Certificate

To replace the existing Local Run Manager certificate, do the following.

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **System Settings**.
2. Select the Certificates tab.
3. Select **Browse**, select the new certificate file (\*.pfx), and then select **Open**.
4. Enter the password for the certificate file, and then select **Set Certificate**.
5. Restart your browser.

## Regenerate a Security Certificate

If there was recent change to the system name or the system was moved to a new domain, you must regenerate the security certificate to regain access to Local Run Manager.

1. Visit <http://localhost> in the system browser.
2. Enter your user credentials if prompted.
3. From the dashboard navigation bar, select the Tools drop-down list, and then select **System Settings**.
4. Select the Certificates tab.
5. Select **Regenerate the Certificate**.
6. Restart your browser.
7. If you need to connect to Local Run Manager from another device, download and install the regenerated certificate on the remote device.



## Change the Network Output Path

For some types of instruments, you access the network output path to the output folder through the instrument control software. In other types of instruments, you access the path through Local Run Manager.

In Local Run Manager, navigate to the network output path. Instructions can vary.

1. Select **Manage Instrument**.
2. Select **System Configuration**.
3. Select **Analysis Configuration**.
4. Select the **Local Run Manager** tab.  
The default user is admin.
5. In the Output folder, enter the full UNC file path to the output folder.  
Make sure to follow UNC path instructions in [Designate the Universal Naming Convention \(UNC\) Network Output Path on page 17](#).
6. Select **Save**.

Both the Windows Account in Local Run Manager and the Windows account on the operating system of the instrument require permission to read and write to the output folder. To check permissions, consult your IT administrator. To set up the Windows Account in Local Run Manager, see [Specify Service Account Settings on page 15](#).

### Designate the Universal Naming Convention (UNC) Network Output Path

In the output folder, enter the full UNC file path. The UNC path includes two backslashes, the server name and the directory name, but **not** a letter for a mapped network drive.

- Paths to the output folder that are one level require a trailing backslash.
  - Example UNC path: \\servername\directory1\
- Paths to the output folder that are two or more levels do not require a trailing backslash.
  - Example UNC path: \\servername\directory1\directory2
- Paths to a mapped network drive cause errors. **Do not use**.
  - Example of a mapped network drive path: T:\sbsfiles

## Modules & Manifests

The Modules & Manifests page provides a list of installed analysis modules in the left navigation panel. Selecting an analysis module name opens a page that lists the module version and last modified date.

When a new or updated analysis module is available, you can download the module from the Illumina website and install it on the Local Run Manager system. For more information, see [Analysis Module Updates on page 29](#).

For analysis modules that require manifests, use the Add Manifests feature to add manifests to the module. When you add manifests for an analysis module from the Modules & Manifests page, the manifests are available for all runs using that analysis module.

Alternatively, you can import a manifest for a specific run using **Import Manifests** on the Create Run page. When you import a manifest from the Create Run page, the manifest is available for the current run only.

## Add Manifest Files to an Analysis Module

1. Make sure that the manifest you want to copy to the module are available in an accessible network location or on a USB drive.
2. From the dashboard navigation bar, select the Tools drop-down list, and then select **Modules & Manifests**.
3. From the list of analysis modules on the left panel, select the appropriate module name.
4. Select **Add Manifests**.
5. Navigate to the manifest and select the manifest that you want to add.  
You can add multiple manifests.

## Export a Manifest File

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **Modules & Manifests**.
2. From the list of analysis modules on the left panel, select the appropriate module name.
3. Select **Export** next to the manifest file that you want to export.

## Delete a Manifest File

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **Modules & Manifests**.
2. From the list of analysis modules on the left panel, select the appropriate module name.
3. Select **Delete** next to the manifest file that you want to remove.

## Audit Trails

Audit trails records information about specific actions, such as user access, user profile changes, and changes to system, run, or analysis parameters. Each audit trail entry includes the following information:

- When, represented as date YYYY-MM-DD and time in 24-hour time format.
- Who, represented by the user name who initiated the action.
- What, represented by a short predefined description of the action taken.

- Affected Item, represented by 4 affected item categories of User, Run, Analysis, or System.

To sort the audit trails list, select any column heading to sort in ascending or descending order. You can filter the audit trails list to show specific data and then export the filtered list to a report in PDF file format.

Only an admin user can view the Audit Trails page.

## Filter Audit Trails

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **Audit Trails**.
2. Select **Filter**.  
You can apply filters to previously filtered results to refine the list even further. To apply a filter to the entire audit trails database, clear previous filters before proceeding.

### Filter by Date

1. In the From field, enter a date (in yyyy-mm-dd format) to specify the beginning date for the filtered results. Alternatively, select the **Calendar** icon, and then select a From date.
2. In the To field, enter a date (in yyyy-mm-dd format) to specify the end date for the filtered results. Alternatively, select the **Calendar** icon, and then select a To date.
3. Select **Filter**.

### Filter by User Name

1. In the Who field, enter a user name.  
You can enter any portion of a user name. Asterisks (\*) are not required.
2. Select **Filter**.

### Filter by Action

1. In the What field, enter an action description.  
You can enter any portion of an action description. Asterisks (\*) are not required.
2. Select **Filter**.

### Filter by Affected Item Description

1. In the Affected Item field, enter any portion of the affected item description.  
The description can be a run name, user name, analysis module name, or report name, for example. You can enter any portion of a description. Asterisks (\*) are not required.
2. Select **Filter**.

## Filter by Affected Item Category

1. To filter by an affected item category, select the **Affected Item** icon and select from the following options:
  - **Analysis**—Filters the list to show changes in analysis parameters or analysis status.
  - **Run**—Filters the list to show changes to run parameters or run status
  - **System**—Filters the list to show actions at the system level, such as file uploads, system maintenance, or security settings.
  - **User**—Filters the list to show user actions and user authentication actions.
2. Select **Filter**.

## Export Audit Trails

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **Audit Trails**.
2. Select **Filter**.
3. Apply preferred filters.
4. Select the **Export**.

The software generates a PDF report that includes the user name, date of export, and filter parameters.

## Library Prep Kits

The Library Prep Kits page provides a list of compatible library prep kit definitions installed with the software. A kit description and read type are listed for each kit.

From the Library Prep Kits page, you can upload a custom library prep kit definition created in an external file. A kit definition lists the compatible analysis modules, index sequences, and the maximum number cycles or reads in a run. Select **Download Template** or visit the Local Run Manager support page on the Illumina website for an example of a library kit definition file.

Guidelines for adding a custom library kit:

- Adding a custom library prep kit is a feature for advanced users.
- Always assign a **unique** kit name. Custom library prep kit names cannot be reused on the same instrument.

## Create a Custom Library Prep Kit Definition File

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **Library Prep Kits**.
2. Select **Download Template**.

A library prep kit definition template file, local-run-manager-library-prep-kit-template.tsv, is saved to your computer.

- Open the template file in a text editor and edit the file with your custom parameters. The template file has the following section titles, headings, and information. Make sure that you separate the parameters with tabs.

- [Kit]**—In this section, specify a kit name and default run parameters.

Row Heading	Description
Name	Assign a unique kit name for the new kit.
Description	A brief description or long kit name.
IndexStrategy	Options are <b>NoIndex</b> , <b>SingleOnly</b> , <b>DualOnly</b> , <b>SingleAndDual</b> , <b>NoAndSingle</b> , <b>NoAndDual</b> , or <b>All</b> . Enter the index strategy exactly as shown with no spaces.
ReadType	Options are <b>Single</b> , <b>Paired</b> , or <b>All</b> .
DefaultReadLength1	The default number of cycles for Read 1, such as <b>151</b> .
DefaultReadLength2	The default number of cycles for Read 2, such as <b>151</b> .

- [Resources]**—In this section, specify custom parameters, such as the maximum number of samples possible.

Column Heading	Description
Name	Enter a name for the parameter. For example, Sample Limit. Spaces are allowed.
Type	Enter a name for the parameter without spaces. For example, SampleLimit.
Format	Enter INT.
Value	Enter a value for the parameter. For example, 384.

- [Indices]**—In this section, specify which index sequences are used with the kit.

Column Heading	Description
Name	List the index sequence name, such as <b>A701</b> .
Sequence	List the index sequence.
IndexReadNumber	Specify the Index Read, either <b>1</b> or <b>2</b> .

**i** | During analysis, the iSeq™100, MiniSeq™ and NextSeq™ Systems automatically reverse

**i** | complement the i5 indexes in custom library prep kits. When using a MiniSeq rapid kit, make sure that the i5 indexes are in the reverse complement orientation. When using all other kits, make sure that the i5 indexes are in the forward orientation.

**i** | Sample sheets produced in Illumina Experience Manager (IEM) is not compatible for use with Local Run Manager except for GenerateFASTQ module. You need to re-export the sample sheet or import the sample sheet and modify the content in LRM prior to saving the run.

- **[SupportedModules]**—In this section, specify analysis modules by name, which associates the new kit with an analysis module on the Create Run page. Make sure that you enter the module name exactly as shown with no spaces.

Module Name	Description
Assembly	Assembly analysis module
AmpliconDSWorkflow	Amplicon DS analysis module
DNAmpliconWorkflow	DNA Amplicon analysis module
DNAEnrichmentWorkflow	DNA Enrichment analysis module
GenerateFastQWorkflow	Generate FASTQ analysis module
LibraryQCWorkflow	Library QC analysis module
MetagenomicsWorkflow	Metagenomics analysis module
PCRAmplicon	PCR Amplicon analysis module
ResequencingWorkflow	Resequencing analysis module
RNAmpliconWorkflow	RNA Amplicon analysis module
RNAFusionWorkflow	RNA Fusion analysis module
SmallRNAWorkflow	Small RNA analysis module

4. Save and rename the file. Do not include spaces in the file name.

## Add a Library Prep Kit

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **Library Prep Kits**.
2. Select **Add Library Prep Kit**.
3. Navigate to the location of the library kit file and add the file.  
The kit name, description, and read type appears on the Library Prep Kits list.

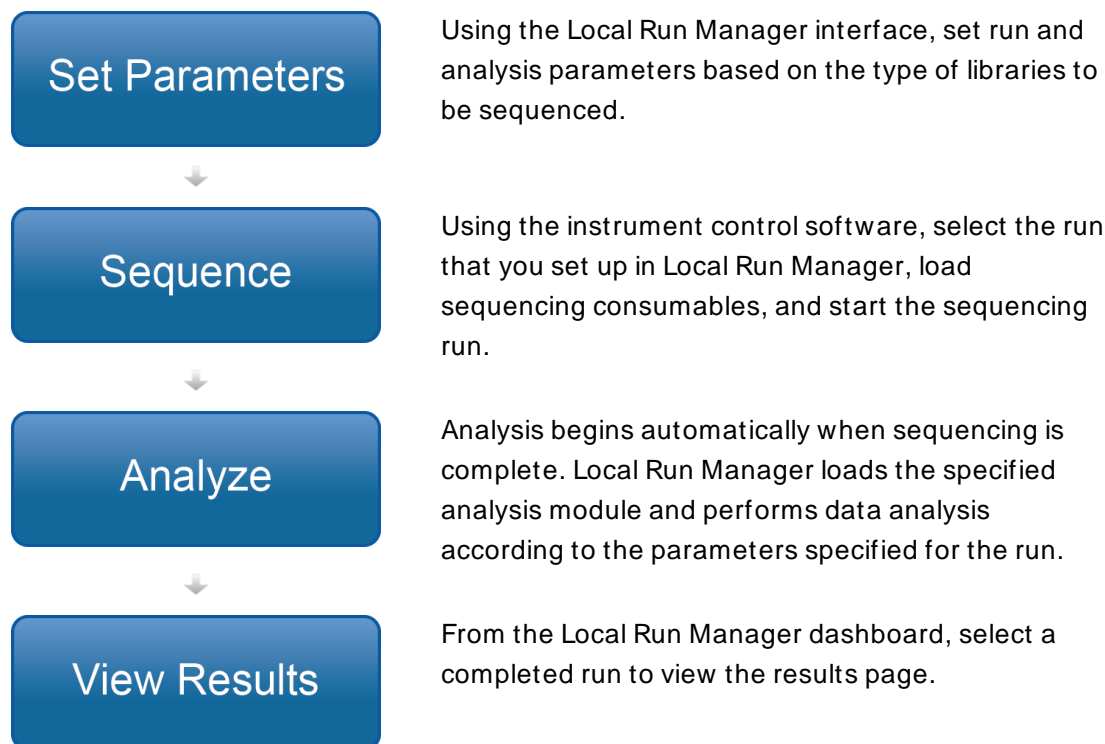
## Delete a Library Prep Kit

1. From the dashboard navigation bar, select the Tools drop-down list, and then select **Library Prep Kits**.
2. Select **Delete** next to the kit you want to delete.  
Only custom kits can be deleted from Local Run Manager.
3. Select **Delete** to confirm the removal of the kit from Local Run Manager.

## Workflow Overview

This guide provides an overview of the workflow for creating a run and viewing analysis results in the Local Run Manager software. Specific steps vary for each analysis module. See the workflow guide for the analysis module you are using for step-by-step instructions.

### Local Run Manager Workflow



## Set Parameters Overview

To set up a run, select **Create Run** from the Local Run Manager dashboard, and then select an analysis module from the drop-down list. The Create Run page provides options for the selected analysis module.

The Create Run page consists of text fields, drop-down lists, toggle settings, and a samples table that is specific to each analysis module. Create Run pages include the following sections:

- Run Name
- Run Settings
- Module-Specific Settings
- Samples

Fields marked with an asterisk (\*) are required.

## Run Name and Description

The run name is the name that identifies the run from sequencing through analysis. A run name can have up to 40 alphanumeric characters. Spaces and the following special characters, ~!@#\$\$%-\_{},., are allowed. A run description is optional and can have up to 150 alphanumeric characters.

## Run Settings

Run settings identify the following parameters for the run.

- The library prep kit used to prepare samples for sequencing
- The read type: single read or paired end
- The number of index reads: 0, 1, or 2
- The number of cycles for each read

For some analysis modules, only a default selection is allowed.

For library kit compatibility, see the [Local Run Manager support page](#) on the Illumina website.

## Module-Specific Settings

The module-specific settings that appear in this section depend on the analysis module selected for the run. Some modules include options for selecting an aligner and variant caller other than the default methods and configurable analysis settings. Some analysis modules do not include any module-specific settings.

For more information, see the workflow guide for the analysis module you are using.

## Samples Section

For each run, identify samples to be sequenced in the samples table. The samples table includes the sample ID, an optional sample name, an optional description, and the indexes used with each sample.

The index columns provide a drop-down list of compatible index sequences based on the library kit specified for the run. For runs using custom index sequences, you can enter the sequence as free text.



**i** | During analysis, the iSeq 100, MiniSeq, and NextSeq Systems automatically reverse complement the i5 indexes in custom library prep kits. When using a MiniSeq rapid kit, make sure that the i5 indexes are in the reverse complement orientation. When using all other kits, make sure that the i5 indexes are in the forward orientation.

For analysis modules that require a manifest, the samples table includes a drop-down list of available manifests associated with the module. You can upload and associate a manifest for an analysis module using the Modules & Manifests menu. See [Add Manifest Files to an Analysis Module on page 18](#). To import a manifest for a specific run, use the Import Manifests command.

For analysis modules that perform alignment or other methods that require a reference genome, the samples table includes a drop-down list of available genome folders. See [Set up a Custom Reference Genome on page 26](#).

You can import samples from a compatible text file and export samples from the samples table for use with another run.

Since sample sheet information can vary on a module-to-module basis, see the workflow user guide for the analysis module you are using for module-specific sample sheet settings.

## Import and Export Sample Sheets

If you already have a sample sheet that you want to use to configure the run, select **Import Sample Sheet** to select the CSV file that contains all the run settings and sample information. Make sure that the sample sheet file that you are importing has the same column headings as the sample table for the current analysis module. For example, if the analysis module requires a manifest file, the sample sheet file must have a manifest column.

After filling out the run information and entering at least one sample in the samples table, you can export the run information to an external CSV file by selecting **Export Sample Sheet**. This is helpful to ensure compatibility on future runs or to use as a template when manually editing sample sheets.

**i** | Make sure that you refer to the [Illumina Adapter Sequences document \(document # 1000000002694\)](#) and the appropriate analysis module user guide when setting up your sample sheets. Entering the incorrect sequences for your library prep kit will cause your analysis to fail.

## Import Manifest Files for the Run

Unlike importing manifest files on the Modules & Manifests page, importing manifest files on the Create Run imports the manifest for the current run only. Make sure that the manifests you want to import for the run are available in an accessible network location or on a USB drive.

## Available Genomes

In addition to the preinstalled genomes, genome sequence files and reference annotation for other commonly used model organisms are available from the [Illumina iGenomes page](#).

The sequence and annotation files for each iGenome are provided in a compressed file format, \*.tar.gz. Make sure that hg19 is the reference genome when using annotation files. Refer to the iGenomes Overview for installation instructions.

## Set up a Custom Reference Genome

In order to use a custom reference genome in Local Run Manager, the genome files must be set up with a specific folder structure.

1. In C:\Illumina\Genomes, create a folder named for the species of your reference genome.
2. In the species folder, create a folder named for the agency that published the reference genome. For example, UCSC, NCBI, or Illumina.
3. In the agency folder, create a folder named for the version of the reference genome. For example, hg19, mm9, or 2005-10-07.
4. In the version folder, create a folder named WholeGenomeFasta.
5. Rename the reference genome FASTA file to genome.fa.
6. Add genome.fa and its associated GenomeSize.xml file to the WholeGenomeFasta folder.

The path to the reference genome is:

```
C:\Illumina\Genomes\<Species>\<Agency>\<Version>\<Sequence>\WholeGenomeFasta\
genome.fa
```

## View Analysis Results Overview

To view analysis results, select the run name from the Local Run Manager dashboard. A summary of analysis results is presented on the following tabs:

- Run Overview
- Sequencing Information
- Samples & Results

### Run Overview Tab

The Run Overview tab lists information about the run, a summary of sequencing metrics, and the location of the run folder.

Section Title	Description
Run Name / Run ID	The run name assigned when the run was created.
Created By	The name of the user who created the run.
Description	The run description, if provided.

Section Title	Description
Output Run Folder	The path to sequencing run output folder. Select <b>Copy to Clipboard</b> for quick access to the output folder.
Total Clusters	The number of clusters in a run.
% Clusters PF	The percentage of clusters passing filter.
% ≥ Q30 (Read 1)	The percentage of reads in Read 1 with a quality score of 30 (Q30) or greater.
% ≥ Q30 (Read 2)	The percentage of reads in Read 2 with a quality score of 30 (Q30) or greater.
Last Scored Cycle	The last cycle in the run with a quality score. Unless the run ended early, this value represents the last cycle in the run.

## Sequencing Information Tab

The Sequencing Information tab provides a summary of sequencing run parameters. The following information is provided on the Sequencing Information tab.

Section Title	Description
Instrument Name	The name of the instrument on which the run was performed.
Module Version	The version of the analysis module assigned to the run.
Sequenced By/Imported By	The name of the user who started or imported the run.
Sequencing Start/Imported On	The date and time that the sequencing run began or was imported.
Read Lengths	The number of reads and cycles for each read performed during the run.
Flow Cell Information	The barcode, part number, lot number, and expiration date of the flow cell used for the run.
Buffer Information	The barcode, part number, lot number, and expiration date of the buffer cartridge used for the run.
PR2 Information	The barcode, part number, lot number, and expiration date of the PR2 bottle used for the run.
Reagent Cartridge Information	The barcode, part number, lot number, and expiration date of the reagent cartridge used for the run.

## Samples & Results Tab

The Samples & Results tab provides a summary of analysis results for each sample listed in the samples table, the location of the analysis folder, and an option to requeue analysis.

The following fields are common for all analysis modules. For descriptions of specific analysis results, see the analysis module workflow guide.

Section Title	Description
Select Analysis	A drop-down list of each analysis performed on the data generated from the sequencing run. For each time that analysis is run, a sequential number is assigned. Results are listed separately.
Analysis Folder	Select <b>Copy to Clipboard</b> for quick access to the analysis folder.

## Possible Run States

The Status column on the dashboard shows the status of each run listed. The following table describes the possible states of a run and the appearance of the status bar.

Status	Status Bar Color	Status Description
Ready for Sequencing	None	Waiting for sequencing to begin.
Sequencing Running	Blue	Sequencing in progress.
Sequencing Stopped	Red	Sequencing stopped. No activity.
Sequencing Unsuccessful	Red	Sequencing issue. No activity.
Sequencing Completed	Blue	Sequencing completed. Status bar at 50%.
Primary Analysis Unsuccessful	Red	RTA analysis failed. Status bar at 25%.
Primary Analysis Completed	Blue	Sequencing metrics complete. Status bar at 50%.
Analysis Queued	Blue	Waiting for analysis to begin.
Analysis Running	Blue	Analysis in progress.
Stopping Analysis	Red	Request to stop analysis received.
Analysis Stopped	Red	Analysis stopped. No activity.
Analysis Unsuccessful	Red	Analysis issue. No activity.

Status	Status Bar Color	Status Description
Analysis Completed	Green	Activity completed. Status bar at 100%.
Analysis Copying	Blue	Analysis is complete. Data is being copied to the output folder.
Stopping Analysis Copy	Red	Analysis is complete. Request to stop copying of analysis data received.
Copy Stopped	Yellow	Analysis is complete. Copying of analysis data was manually stopped.

## Analysis Module Updates

When a new analysis module or new version of an analysis module is available, you can download the installable file from the Illumina support site and install it onto the Local Run Manager system.

### Install or Update Analysis Modules

1. Download the installable file for the new or updated analysis module from the Local Run Manager support page on the Illumina website.
2. Copy the installable file (\*.msi or \*.exe) to the instrument or to a USB drive.
3. From the instrument computer, double-click the installable file.
4. If User Management is turned on, enter your Local Run Manager user name and password when prompted.  
You must have admin-level permissions.
5. Select **Next** to begin the installation.
6. When the installation is complete, select **Finish**.
7. Refresh your browser.
8. To confirm that the analysis module is available for use, select the Tools drop-down list, and then select **Modules & Manifests** from the Local Run Manager dashboard.

### Uninstall Local Run Manager

From the computer Control Panel, uninstall components in the following order.

1. Uninstall the analysis module. If prompted, enter the Admin user name and password.
2. Uninstall Local Run Manager as follows.
  - a. Double-click **Local Run Manager**.
  - b. Select **Options**.

- c. Select **Uninstall All Components**, and then select **OK**.
  - d. Select **Uninstall**.
3. Manually delete the reference genome files from their folder locations.

# Technical Assistance

For technical assistance, contact Illumina Technical Support.

Website: [www.illumina.com](http://www.illumina.com)

Email: [techsupport@illumina.com](mailto:techsupport@illumina.com)

## Illumina Technical Support Telephone Numbers

Region	Toll Free	International
Australia	+61 1800 775 688	
Austria	+43 800 006249	+43 19286540
Belgium	+32 800 77 160	+32 3 400 29 73
Canada	+1 800 809 4566	
China		+86 400 066 5835
Denmark	+45 80 82 0183	+45 89 87 1156
Finland	+358 800 918 363	+358 9 7479 0110
France	+33 8 05 10 2193	+33 170 77 04 46
Germany	+49 800 101 4940	+49 89 3803 5677
Hong Kong, China	+852 800 960 230	
India	+91 8006500375	
Indonesia		0078036510048
Ireland	+353 1800 936608	+353 1 695 0506
Italy	+39 800 985513	+39 236003759
Japan	+81 0800 111 5011	
Malaysia	+60 1800 80 6789	
Netherlands	+31 800 022 2493	+31 20 713 2960
New Zealand	+64 800 451 650	
Norway	+47 800 16 836	+47 21 93 96 93
Philippines	+63 180016510798	
Singapore	1 800 5792 745	
South Korea	+82 80 234 5300	
Spain	+34 800 300 143	+34 911 899 4 17

Region	Toll Free	International
Sweden	+46 2 00883979	+46 8 50619671
Switzerland	+41 800 200 442	+41 56 580 00 00
Taiwan, China	+886 8 06651752	
Thailand	+66 1800 011 304	
United Kingdom	+44 800 012 6019	+44 20 7305 7197
United States	+1 800 809 4566	+1 858 202 4566
Vietnam	+84 1206 5263	

**Safety data sheets (SDSs)**—Available on the Illumina website at [support.illumina.com/sds.html](https://support.illumina.com/sds.html).

**Product documentation**—Available for download from [support.illumina.com](https://support.illumina.com).





Illumina

5200 Illumina Way

San Diego, California 92122 U.S.A.

+1.800.809.ILMN (4566)

+1.858.202.4566 (outside North America)

[techsupport@illumina.com](mailto:techsupport@illumina.com)

[www.illumina.com](http://www.illumina.com)

**For Research Use Only. Not for use in diagnostic procedures.**

© 2019 Illumina, Inc. All rights reserved.

**illumina®**