

BaseSpace Onsite Sequence Hub

Site Prep Guide

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Introduction

This guide provides the information needed for you to prepare your site for the installation and operation of the BaseSpace Onsite Sequence Hub:

- ▶ Space requirements
- ▶ Electrical requirements
- ▶ Environmental considerations
- ▶ Computing requirements
- ▶ Network considerations
- ▶ Data encryption requirements

Additional Resources

The following documentation is available for download from the Illumina website. A MyIllumina login is required.

- ▶ *BaseSpace HT Onsite Sequence Hub System Guide (document # 15049148)* —Provides instructions for using the BaseSpace HT Onsite Sequence Hub.
- ▶ *BaseSpace LT Onsite Sequence Hub System Guide (document # 1000000002666)* —Provides instructions for using the BaseSpace LT Onsite Sequence Hub.
- ▶ *BaseSpace Onsite Sequence Hub Help (part # 15049175)*—Provides instructions for using the BaseSpace Onsite Sequence Hub, including descriptions of the graphs generated for each analysis workflow.

Visit the Illumina website for access to documentation, software downloads, and frequently asked questions.

To view a list of BaseSpace Onsite Sequence Hub training courses, go to support.illumina.com/training/sequencing_training.ilmn.

Delivery and Installation

A service provider authorized by Illumina delivers, unpacks, and positions the BaseSpace Onsite Sequence Hub nodes. The space must be ready before delivery. An Illumina representative installs the nodes.



CAUTION

Only personnel authorized by Illumina can unpack, install, or move BaseSpace Onsite Hub nodes.

Carton Dimensions and Contents

BaseSpace Onsite Sequence Hub Carton Dimensions

The BaseSpace Onsite Sequence Hub node with accessories is shipped in one carton. Use the following dimensions to determine the minimum door width required to accommodate the carton.

Measurement	Carton Dimensions
Width	85.1 cm (33.5 in)
Height	41.0 cm (16.0 in)
Depth	62.2 cm (24.5 in)
Weight	38.4 kg (84.6 lbs.)

The container contains the node along with the following components:

- ▶ Power cords, 2, country-specific
- ▶ Ethernet cable, 1
- ▶ Keys for bezel
- ▶ Windows activation key
- ▶ Rail screws
- ▶ Instructions for racking the node

Rack Carton Dimensions

For the BaseSpace HT Onsite Hub only, a rack is shipped preassembled in one carton. Use the following dimensions to determine the minimum door width required to accommodate the carton. Up to 3 nodes can be installed in 1 rack.

Measurement	Carton Dimensions
Width	86.4 cm (34.0 in)
Height	135.0 cm (53.0 in)
Depth	133.4 cm (52.5 in)
Weight	258.1 kg (569.0 lbs.)

Network Accessible Storage

The network accessible storage and accessories are shipped in a carton with the following dimensions and weight.

Measurement	Carton Dimensions
Width	36.2 cm (14.25 in)
Height	29.2 cm (11.5 in)
Depth	32.0 cm (12.5 in)
Weight	8.6 kg (19.0 lbs.)

Switch

The switch is shipped in a carton with the following dimensions and weight.

Measurement	Carton Dimensions
Width	56.5 cm (22.25 in)
Height	9.5 cm (3.75 in)
Depth	29.2 cm (11.5 in)
Weight	4.1 kg (9.0 lbs.)

Space Requirements

This section provides the space and placement requirements for BaseSpace Onsite Sequence Hub nodes.

Equipment Dimensions and Weight

This section includes information on the dimensions and weight of the BaseSpace Onsite Sequence Hub node and other system components.

BaseSpace Onsite Sequence Hub Node

A stand-alone BaseSpace Onsite Sequence Hub node has the following dimensions and weight:

Measurement	Stand-alone Node Dimensions
Width	17.8 cm (7.0 inches)
Height	43.8 cm (17.25 inches)
Depth	63.5 cm (25.0 inches)
Weight	29.0 kg (64.0 lbs)

BaseSpace HT Onsite Hub Rack

A BaseSpace HT Onsite Hub rack has the following dimensions and weight. Each rack can hold up to 3 nodes.

Measurement	Rack Dimensions
Width	64.8 cm (25.5 inches)
Height	96.5 cm (38.0 inches)
Depth	102.9 cm (40.5 inches)
Weight	145.6 kg (321.0 lbs.)

Network Accessible Storage

BaseSpace Onsite Sequence Hub network accessible storage has the following dimensions and weight:

Measurement	Network Accessible Storage Dimensions
Width	24.8 cm (9.75 inches)
Height	15.9 cm (6.25 inches)
Depth	23.5 cm (9.25 inches)
Weight	7.3 kg (16.0 lbs.)

Switch

Measurement	Switch Dimensions
Width	44.5 cm (17.5 inches)
Height	4.4 cm (1.75 inches)
Depth	26.0 cm (10.25 inches)
Weight	3.0 kg (6.5 lbs.)

Space and Placement Requirements

Each BaseSpace Onsite Sequence Hub node must be positioned to allow for:

- ▶ Power cord connection to 2 power outlets
- ▶ The quick disconnection of 2 power cords from the outlets
- ▶ Proper ventilation
- ▶ Service access

Single Node — Upright Position

To position the node upright, it must be accessible from all sides with the following minimum clearance dimensions:

Access	Minimum Clearance for a Single Upright Node
Sides	Allow at least 61 cm (24 in) on each side of the node.
Rear	Allow at least 10.2 cm (4 in) behind the node.
Top	Allow at least 61 cm (24 in) above the node. If the node is positioned under a shelf, make sure that the minimum clearance requirement is met.

- ▶ Two standard power sockets within 6 ft of the node
- ▶ One network socket located within 6 ft of the node (or longer network cable provided by customer)
- ▶ Two static reserved IP addresses

Racked Nodes

Follow these guidelines to determine where to locate the BaseSpace HT Onsite Hub rack of nodes.

Access	Minimum Clearance for a Rack of Nodes
Sides	Allow at least 61 cm (24 in) on each side of the rack.
Rear	Allow at least 61 cm (24 in) behind the rack.
Top	Allow at least 61 cm (24 in) above the rack.

- ▶ One standard power socket within 6 ft of the rack
- ▶ One network socket located within 3 ft of the rack (or longer network cable provided by customer)
- ▶ Two static reserved IP addresses per node

Single Node - Racked Position

4U per node is required when installing nodes in a rack.

Electrical Requirements

This section lists power specifications and electrical requirements for the BaseSpace Onsite Sequence Hub.

Power Specifications

Power	Specification
BTU/hour	1790.1
Input Voltage	100–240 Volts AC @ 47–63 Hz
Output Voltages	4x 12 V 1x 5 V 1x 3.3 V

Receptacles

Your facility must be wired with the following receptacles:

- ▶ **For 100–110 Volts AC**—Two 10 amps grounded, dedicated lines with proper voltage and electrical ground are required.
- ▶ North America and Japan—Receptacle: NEMA 5-15
- ▶ **For 220–240 Volts AC**—Two 6-amp grounded lines with proper voltage and electrical ground are required.
- ▶ If the voltage fluctuates more than 10%, power line regulators are required.

Protective Earth



The instrument has a connection to protective earth through the enclosure. The safety ground on the power cord returns protective earth to a safe reference. The protective earth connection on the power cord must be in good working condition when using this device.

Power Cords

BaseSpace Onsite Sequence Hub nodes have international standard IEC 60320 C13 receptacles, and are shipped with 2 region-specific power cords.

Hazardous voltages are removed from the instrument only when the power cords are disconnected from the AC power source.

To obtain equivalent receptacles or power cords that comply with local standards, consult a third-party supplier such as Interpower Corporation (www.interpower.com).



CAUTION

Never use an extension cord to connect the instrument to a power supply.

Fuses

BaseSpace Onsite Sequence Hub nodes contain no user-replaceable fuses.

Uninterruptible Power Supply

Illumina recommends the use of a user-supplied uninterruptible power supply (UPS). Illumina is not responsible for data loss affected by interrupted power regardless of whether the node is on a UPS. Standard generator-backed power is often not uninterruptible, and a brief power outage occurs before power resumes. This type of power outage interrupts analysis and data transfer.

UPS Recommendations for Stand-Alone Nodes

The following table includes the UPS recommendations for stand-alone nodes.

Brand and Model	Tripp Lite Model # SMART1500SLT	Tripp Lite Model # SMX1500SLT
Nominal Output Voltages Supported	100 V/110 V/120 V	220 V/230 V/240 V
Output Volt Amp Capacity	1500 VA	1500 VA
Output kVA Capacity	1.5 kVA	1.5 kVA
Output Watt Capacity	900 W	900 W
Frequency Compatibility	50/60 Hz	50/60 Hz
Built-in UPS Output Receptacles	Eight 5-15R outlets	Eight C13 outlets
Half Load Run Time	20 minutes (450w)	20 minutes (450w)
Full Load Run Time	8 minutes (900w)	8 minutes (900w)
Rated Input Current (at maximum load)	10.1A (100 V), 9.3A (110 V), 8.6A (120 V)	4.1A (220 V), 3.9A (230 V), 3.8 (240 V)
Nominal Input Voltages Supported	100 V AC; 110 V AC; 120 V AC	220 V AC; 230 V AC; 240 V AC
UPS Input Connection	5-15P	C14 inlet
Phase	Single phase	Single phase

UPS Recommendations for Racked Nodes

The following table includes the UPS recommendations for racked nodes. They replace the 2 power distribution units in the rack configuration.

Brand and Model	Tripp Lite Model # SU3000RTXL3U	Tripp Lite Model # SUINT3000RTXL3U
Nominal Output Voltages Supported	110 V/120 V	200 V/220 V/230 V/240 V
Output Volt Amp Capacity	3000 VA	3000 VA
Output kVA Capacity	3 kVA	3 kVA
Output Watt Capacity	2400 W	2400 W
Frequency Compatibility	50/60 Hz	50/60 Hz
Built-in UPS Output Receptacles	Four 5-15R outlets Four 5-15/20R outlets One L5-30R outlet	Eight C13 outlets Two C19 outlets
Output Circuit Breaker	15A branch rated (x2) - each breaker protects 4 outlets, L5-30R is unbreakered	10A (x2) each breaker protects 4 C13 outlets, C19 is unbreakered
Half Load Run Time	14 minutes (1200w)	14 minutes (1200w)
Full Load Run Time	5 minutes (2400w)	5 minutes (2400w)
Rated Input Current (at maximum load)	24A	14.9A (200 V),14.3A (208 V). 13.1A (220 V), 12.6A (230 V), 12.1A (240 V)
Nominal Input Voltages Supported	110 V AC; 120 V AC	200 V AC, 220 V AC, 230 V AC, 240 V AC
UPS Input Connection	L5-30P	C20 inlet
Input Circuit Breaker	40A	25A
Phase	Single phase	Single phase

Product Certifications and Compliance

BaseSpace Onsite Sequence Hub is certified to the following standards:

- ▶ United States:
 - ▶ FCC Class A
 - ▶ UL 60950
- ▶ CE
- ▶ RoHS
- ▶ CCC
 - ▶ China: GB4943.1-2011, GB9254-2008, GB17625.1-2003
- ▶ KCC
 - ▶ Korea: Clause 3, Article 58-2 of Radio Waves Act
- ▶ BSMI
 - ▶ Taiwan: CNS14336-1, CNS13438

Environmental Considerations

Element	Specification
Temperature	Maintain a lab temperature of 19°C to 25°C (22°C \pm 3°C). This temperature is the operating temperature of the node. Do not allow the ambient temperature to vary by more than \pm 2°C.
Humidity	Maintain a noncondensing relative humidity between 20–80%.
Altitude	Locate the node at an altitude below 2,000 meters (6,500 feet).
Air Quality	Operate the node in a Pollution Degree II environment or better. A Pollution Degree II environment is defined as an environment that normally includes only nonconductive pollutants.
Ventilation	Consult your facilities department for ventilation requirements sufficient for the level of heat output expected from the node.

Heat Output for a Single Node

Measured Power	Thermal Output
750 Watts	1,790.1 BTU/h

Noise Output for a Single Node

BaseSpace Onsite Sequence Hub nodes are air-cooled. Noise from the fan is clearly audible when the node is running.

Noise Output (dB)	Distance from Node
42.7 dB	1 meter (3.3 feet)

A measurement of < 62 dB is the level of a normal conversation at a distance of approximately 1 meter (3.3 feet).

Network Considerations

Before installing the BaseSpace Onsite Sequence Hub, Illumina requires that you complete and return *BaseSpace Onsite Sequence Hub Customer Pre-Installation Form*. Some of the information required on this form is listed in this section.

General Networking Support

General networking support includes the following requirements and recommendations:

- ▶ A 1 gigabit connection between the head node and your network is required. This connection can be made directly or through a network switch.
- ▶ To archive data, a network storage device that uses the Common Internet File System (CIFS) is required.
- ▶ Ask your IT professional to review network maintenance activities for potential compatibility risks with the system.
- ▶ If you are purchasing an Illumina storage device, an additional IP address is required for product installation.

Head Nodes

- ▶ Default gateway address
- ▶ IP addresses required:
 - ▶ Two static dedicated IP addresses
 - ▶ DNS Server IP address
- ▶ SMTP server
- ▶ Subnet mask

Compute Nodes

No IP addresses are required for compute nodes.

Security and Safety

The BaseSpace Onsite Sequence Hub was designed in favor of being attack-proof. We rely on the customer to provide:

- ▶ A secure internal LAN—If someone can reprogram your routers, they can see the data being sent to all web browsers.
- ▶ Control over physical access to the server—If someone can steal your BaseSpace Onsite Hub server, they can take the RAID controller and disk drives, and access all your data. They can also boot in single-user mode and access the whole system.

Virus Scanners

We do not run any virus scanners on BaseSpace Onsite Sequence Hub nodes. In general, virus scanners impose an unacceptable performance overhead on High-Performance Computing (HPC) systems. However, we have employed several mechanisms to provide security.

Restricted Ports and Authentication

The only connections that can be made to the BaseSpace Onsite Sequence Hub are the web server and the object store.

The web server (on ports 7070, 8080, and 80) uses robust authentication mechanisms and a site-specific encryption key for authentication cookies. This code also uses a database abstraction layer that protects against SQL-injection attacks.

The object store requires authentication for each request. Because the authentication service does not accept requests from the outside, the only way to get an authentication token is via the web services, which require authentication.

In both cases, authentication tokens are time-limited to 24 hours (or less, depending on the use case). For the web browser, the authentication token is session-based, so it is cleared when the user closes their browser.

Stack Overflow Protection

Modern processors address stack overflow attacks by disabling coded execution in *data* sections of the program. We enable this feature by default.

Signed Program Updates

All program updates are signed with a cryptographic signature, and that signature is verified before they are installed. The USB drive inserted into the server is scanned for updates, but no code is ever executed from that drive.

Physical Access for Administration

Privileged access (such as SSH) requires connecting to a special ethernet port on the machine.

Data Encryption Requirements

Data encryption is a feature that is available for BaseSpace Onsite Sequence Hub. If data encryption is required, then your organization is responsible for enabling this feature, and for generating and storing the data encryption key.



IMPORTANT

Illumina does not store or keep a record of the data encryption. Nor will the Illumina representative enable data encryption on the BaseSpace Onsite Sequence Hub node. Enabling this feature, and storage of the data encryption key, is the sole responsibility of the customer.

To enable this feature, the following resources are required during system installation:

- ▶ An individual from your organization who is:
 - ▶ Authorized to enable the data encryption feature in the BaseSpace Onsite Sequence Hub installation software.
 - ▶ Available during system installation to perform the following steps.
- ▶ An IT representative from your organization.
- ▶ A USB drive, FAT32 format, to which the data encryption key is uploaded.

Data encryption is enabled during system installation. When the Data Encryption Settings screen (Figure 1) is displayed, the authorized individual from your organization must:

- 1 Enter the full name of your company or organization in the **I Agree** field.
- 2 Select **Enable Encryption**.
- 3 Insert a USB drive into a port on the head node.
- 4 Click **Export** to generate an encryption key and export it to the USB drive.
- 5 Click **Begin Installation**.

Figure 1 Data Encryption Screen

Data Encryption Settings

NOTE: Only the end user/customer should complete the actions on this screen.

I Agree (enter customer full name)

Disable Encryption

Enable Encryption

ENCRYPTION: If this Product or the Software supports encryption, you agree that you, and not Illumina, are responsible for proper management of the encryption keys even if Illumina assisted you in enabling encryption on this Product or with this Software. You acknowledge that failure to properly manage your encryption keys may result in loss of access to data.

Export auto-generated encryption key

Technical Assistance

For technical assistance, contact Illumina Technical Support.

Table 1 Illumina General Contact Information

Website	www.illumina.com
Email	techsupport@illumina.com

Table 2 Illumina Customer Support Telephone Numbers

Region	Contact Number	Region	Contact Number
North America	1.800.809.4566	Japan	0800.111.5011
Australia	1.800.775.688	Netherlands	0800.0223859
Austria	0800.296575	New Zealand	0800.451.650
Belgium	0800.81102	Norway	800.16836
China	400.635.9898	Singapore	1.800.579.2745
Denmark	80882346	Spain	900.812168
Finland	0800.918363	Sweden	020790181
France	0800.911850	Switzerland	0800.563118
Germany	0800.180.8994	Taiwan	00806651752
Hong Kong	800960230	United Kingdom	0800.917.0041
Ireland	1.800.812949	Other countries	+44.1799.534000
Italy	800.874909		

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

Product documentation—Available for download in PDF from the Illumina website. Go to support.illumina.com, select a product, then select **Documentation & Literature**.



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