Labware MiniHub

Safety and Installation Guide

Original instructions

Agilent Technologies

Notices

User Guide Part Number

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A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

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Agilent Technologies	**DECLARATION OF INCORPORATION** According to Directive 2006/42/EC, Annex II, part B

Manufacturer's Name: Agilent Technologies, Inc.
Automation Solutions Division

Manufacturer's Address: 5301 Stevens Creek Boulevard
Santa Clara, California 95051
USA

Declares under sole responsibility that the product as originally delivered

Type of Equipment: microplate storage or rotator
Product Name: Labware MiniHub or Microplate Exchanger
Model Numbers: G5508-60009, G5508-60010, G5508-60030, or G5508-60011
Product Options: all
Serial Number: all (see serial numbers on product)

is incomplete machinery and must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of Machinery Directive 2006/42/EC. This equipment complies with all applicable EHSRs in Annex I, but cannot in itself perform a specific application and is intended to be installed and used only as part of a complete system.

Agilent Technologies also hereby declares that these models comply with the essential requirements of the following European Directives and bear the CE Marking accordingly:

EMC Directive 2004/108/EC

and conform with the following product standards:

IEC 61326-1:2005 / EN 61326-1:2006 (EMC)
IEC 61010-1:2001 / EN 61010-1:2001 (safety)

Relevant technical documentation is compiled in accordance with part B of Annex VII of the Machinery Directive. We undertake to transmit, via email, relevant information on the partly completed machinery in response to a reasoned request by national authorities.

Name and address of the person established in the Community authorized to compile the technical file or the relevant technical documents:

Agilent Technologies Deutschland GmbH
Herrenbergerstrasse 130
71034 Boblingen
Germany

Supplementary Information:
The products were tested in a typical configuration with Agilent Technologies test systems.

This Declaration of Incorporation applies to above-listed products placed on the EU market after:

15 December 2010

Agilent Technologies	**EC DECLARATION OF CONFORMITY** in accordance with EN ISO 17050-1:2004	CE

Manufacturer's Name: Agilent Technologies, Inc.,
Automation Solutions Division

Manufacturer's Address: 5301 Stevens Creek Boulevard
Santa Clara, California 95051
USA

hereby declares that:
equipment model: G5473A 24VDC Power supply (G5508-60008)

complies with the essential requirements of the following European Directives and bears the CE Marking accordingly:

EMC Directive 2004/108/EC
Low Voltage Directive 2006/95/EC

and conforms with the following product standards:

EMC: IEC 61326-1:2005 / EN 61326-1:2006
Safety: IEC 61010-1:2001 / EN 61010-1:2001

15 December 2010

Contents

Preface

This preface contains the following topics:

About this guide

Who should read this guide

This guide is for people with the following job roles:

Job role	Responsibilities
Installer	Unpacks, installs, and tests the Labware MiniHub, or Labware MiniHub, before it is used.
Integrator	Writes software and configures hardware.
Lab manager, administrator, or technician	• Manages the automation system that contains the Labware MiniHub • Develops the applications that are run on the system • Develops training materials and standard operating procedures for operators
Operator	Performs the daily production work on the system that contains the Labware MiniHub and solves routine problems.

Installers, integrators, lab managers, and administrators are users who must have technical expertise. In addition, lab managers and administrators are individuals or groups responsible for the use and maintenance of the Labware MiniHub and for ensuring that operators are adequately trained.

What this guide covers

This guide describes the following:

- Potential safety hazards of the Labware MiniHub and how to avoid them.
- Specifications and site requirements for the Labware MiniHub. Use this information to plan the space for the Labware MiniHub. Make sure your site meets the requirements outlined in this guide before installing the MiniHub.
- Installation instructions for the Labware MiniHub.

Related guides

The *Labware MiniHub Safety and Installation Guide* should be used in conjunction with the following user documents:

- *Labware MiniHub Unpacking Guide*. Explains how to unpack and pack the Labware MiniHub.
- *Labware MiniHub User Guide*. Explains how to set up and operate the Labware MiniHub.
- *VWorks Automation Control Setup Guide*. Explains how to define labware, track labware, and manage users.
- *VWorks Automation Control User Guide*. Explains how to add devices, create protocols, and set task parameters for each device in the system.
- *VWorks Software Quick Start*. Provides an overview of how to use the VWorks Automation Control software.

Accessing Agilent Technologies Automation Solutions user guides

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Safety information for the Agilent Technologies devices appears in the corresponding device safety guide or user guide. You can also search the knowledge base or the PDF files for safety information.

Related topics

For information about...	See...
Reporting problems	"Reporting problems" on page x
Safety precautions	"Safety guidelines" on page 1
Site requirements and robot specifications	"Laboratory setup requirements" on page 13
Installation instructions	"Installing the Labware MiniHub" on page 27

Reporting problems

Contacting Automation Solutions Technical Support

If you find a problem with the Labware MiniHub, contact Automation Solutions Technical Support at one of the following:

Europe

Phone: +44 (0)1763850230

email: euroservice.automation@agilent.com

US and rest of world

Phone: 1.800.979.4811 (US only) or +1.408.345.8011

email: service.automation@agilent.com

Reporting hardware problems

When contacting Agilent Technologies, make sure you have the serial number of the device ready.

Reporting software problems

When you contact Automation Solutions Technical Support, make sure you provide the following:

- Short description of the problem
- Relevant software version number (for example, automation control software, diagnostics software, ActiveX control software, and firmware)
- Error message text (or screen capture of the error message dialog box)
- Relevant files, such as log files

Reporting user guide problems

If you find a problem with this user guide or have suggestions for improvement, send your comments in an email to documentation.automation@agilent.com.

Related topics

For information about...	See...
What this guide covers	“About this guide” on page viii
Safety precautions	“Safety guidelines” on page 1
Installation instructions	“Installing the Labware MiniHub” on page 27

1 Safety guidelines

This chapter contains the following topics:

General safety information

Before installing and using the Labware MiniHub

Before installing and using the Labware MiniHub, make sure you are aware of the potential hazards and understand how to avoid being exposed to them. You must be properly trained in the correct and safe installation and operation of the device.

Intended product use

WARNING **Do not remove the Labware MiniHub exterior covers or otherwise disassemble the system or device. Doing so can cause injuries and damage the Labware MiniHub.**

Agilent Technologies products must only be used in the manner described in the Agilent Technologies product user guides. Any other use may result in damage to the product or personal injury. Agilent Technologies is not responsible for any damages caused, in whole or in part, by improper use of the products, unauthorized alterations, adjustments or modifications to the products, failure to comply with procedures in Agilent Technologies product user guides, or use of the products in violation of applicable laws, rules or regulations. Except as otherwise expressly provided in Agilent Technologies product user guides, any alteration, adjustment or modification to the products will void the product warranty and may invalidate the safety compliance certification.

EU installations only. The Labware MiniHub is intended to be installed in a laboratory automation system or workstation (completed system). The manufacturer of the completed system containing the Labware MiniHub is responsible for compliance with the provisions of the Machinery Directive 2006/42/EC. See "Mechanical hazards" on page 9. See also Annex I of the Machinery Directive for the list of the Essential Health and Safety Requirements (EHSR) that must be met.

The Labware MiniHub is not intended or approved for diagnosis of disease in humans or animals. You assume full responsibility for obtaining any regulatory approvals required for such use and assume all liability in connection therewith.

Safety labels

Warnings in the user documentation or on the device must be observed during all phases of operation, service, and repair of this device. Failure to comply with these precautions violates safety standards of design and the intended use of the product. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

The following table lists the common symbols you might find on the device. The symbol on the label indicates the risk of danger. A description of the warning and information that will help you avoid the safety hazard are provided in this guide.

Symbol	Description
	Indicates that you must read the accompanying instructions (for example, the safety chapter) for more information.
	Indicates hazardous voltages.
	Indicates pinch, crush, and cut hazard.
	Indicates laser hazard.
	Indicates hot surface hazard.
	Indicates protective conductor terminal.
	Indicates that you must not discard this electrical/ electronic product in domestic household waste.

Related information

For information about...	See...
Safety and regulatory certifications	“Safety and regulatory compliance” on page 4
Emergency stop	“Emergency stop” on page 6
Safety interlock	“Safety enclosure and interlock” on page 9
Electrical hazards	“Electrical hazards” on page 8
Mechanical hazards	“Mechanical hazards” on page 9

Safety and regulatory compliance

The Labware MiniHub complies with the applicable EU Directives and bears the CE mark. The following table describes important aspects of Regulatory Compliance for this product. See the Declaration of Conformity or Declaration of Incorporation, as applicable, for details.

Regulatory Complicance	Standard
EMC	
European Union	EMC Directive 2004/108/EC
	IEC 61326-1:2005 / EN 61326-1:2006
Canada	ICES/NMB-001:2004
Australia/New Zealand	AS/NZS CISPR 11:2004
Safety	
European Union	Machinery Directive 2006/42/EC
	Low Voltage Directive 2006/95/EC
	IEC 61010-1:2001 / EN61010-1:2001
Canada	CAN/CSA-C22.2 No. 61010-1-04
USA	ANSI/UL 61010-1:2004

Electromagnetic compatibility

If the Labware MiniHub causes interference with radio or television reception, which can be determined by turning the device off and on, try one or more of the following measures:

- Relocate the radio or television antenna.
- Move the device away from the radio or television.
- Plug the device into a different electrical outlet, so that the device and the radio or television are on separate electrical circuits.
- Make sure that all peripheral devices are also certified.
- Make sure that appropriate cables are used to connect the device to peripheral equipment.
- Consult your equipment dealer, Agilent Technologies, or an experienced technician for assistance.

Changes or modifications not expressly approved by Agilent Technologies could void the user's authority to operate the equipment.

Sound emission declaration

Sound pressure: Lp < 70 dB according to EN 27779:1991.

Schalldruckpegel: LP < 70 dB nach EN 27779:1991.

Related information

For information about...	See...
General safety information	“General safety information” on page 2
Safety symbols and labels	“Safety labels” on page 2
Emergency stop	“Emergency stop” on page 6
Safety interlock	“Mechanical hazards” on page 9
Electrical hazards	“Electrical hazards” on page 8
Mechanical hazards	“Mechanical hazards” on page 9

Emergency stop

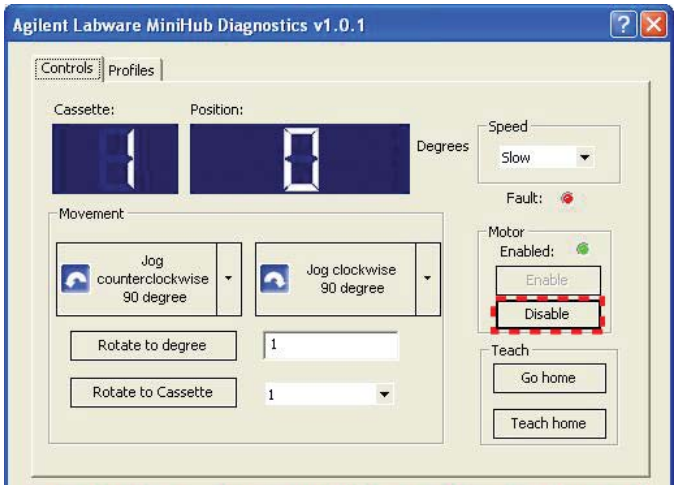
Emergency stop mechanisms

In an emergency, you can press the power switch on the front of the Labware MiniHub power supply to turn it off (1) or disconnect the AC power cord from the power source. Turning off the Labware MiniHub stops the motor immediately.

If the MiniHub is integrated in an automation system, Agilent Technologies recommends that you install a system-wide emergency stop button to cut power to the MiniHub and all devices simultaneously. You can connect the MiniHub power supply to a power source that is controlled by the system-wide emergency-stop circuit.

Disabling the motor using software controls

When using the VWorks software under normal operating conditions, the MiniHub motor is disabled automatically when a collision occurs or when the emergency-stop or interlock circuitry is triggered. You can also use the Disable command in the MiniHub Diagnostics to stop the motor when setting the MiniHub home position or when retrieving labware after a run error occurs. For information, see the *Labware MiniHub User Guide*.



If you are using third-party automation software instead of the VWorks software, call the DisableMotor ActiveX method to disable the MiniHub motor. For more information about the MiniHub ActiveX interface, see the *Labware MiniHub User Guide*.

Related information

For information about...	See...
Lab automation system emergency stop mechanism	Lab automation system user documentation
General safety information	“General safety information” on page 2
Safety and regulatory certifications	“Safety and regulatory compliance” on page 4
Safety symbols and labels	“Safety labels” on page 2
Safety interlock	“Mechanical hazards” on page 9
Electrical hazards	“Electrical hazards” on page 8
Mechanical hazards	“Mechanical hazards” on page 9

Electrical hazards

Hazardous-voltage electronics

Hazardous-voltage electronics can be found within the Labware MiniHub 24 VDC power supply. Under normal operating conditions, you are protected from exposure to the hazardous voltage if you follow installation and operating instructions and do not remove the protective covers.

Hazardous-voltage electronics can also be found in the computer that is controlling the Labware MiniHub. See the computer manufacturer documentation for the hazard warnings. Make sure you follow the instructions on the safe operation of the computer.

WARNING **Ensure that the power cords are in good condition and are not frayed. Use of frayed or damaged power cords can cause injury. Use of incorrect power cords can cause damage to the device.**

Related information

For information about...	See...
General safety information	“General safety information” on page 2
Safety and regulatory certifications	“Safety and regulatory compliance” on page 4
Safety symbols and labels	“Safety labels” on page 2
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Safety interlock	“Mechanical hazards” on page 9
Mechanical hazards	“Mechanical hazards” on page 9

Mechanical hazards

Safety enclosure and interlock

Although the Labware MiniHub has speed and energy limited to avoid creating a hazard, Agilent Technologies recommends that you install the system that contains the Labware MiniHub inside an enclosure or behind a safety shield. Safety-interlocked doors or light curtains that stop the system when opened or interrupted can be used to further mitigate system risk. Make sure the safety-interlocked enclosure complies with your country's safety regulations.

EU installations only. The manufacturer of the completed system containing the Labware MiniHub is responsible for compliance with the provisions of the Machinery Directive 2006/42/EC. See Annex I of the Machinery Directive for the list of the Essential Health and Safety Requirements (EHSR) that must be met by the complete system.

WARNING **System administrators. If you override the system safety interlock, be sure to keep out of the system while it is starting up or in operation. Wear protective eyewear when entering the system if other devices or chemicals being used present a hazard.**

Moving parts and pinch hazards

The Labware MiniHub is an automated device that can rotate left or right unexpectedly. You cannot anticipate the movement of the device with certainty, because the software determines when to move the device to achieve the highest throughput.

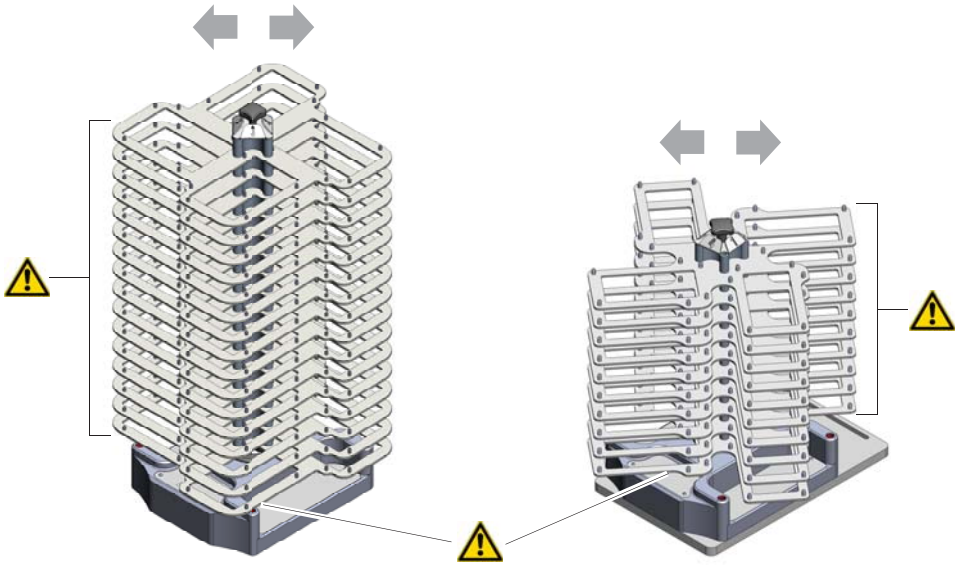
The Labware MiniHub is designed with many safety features. The shelves on the device have blunt edges, and the rotation speed and force are inherently limited. In addition, the Labware MiniHub is designed to stop its movement when it comes in contact with an obstacle. Because of these safety features, moving parts are not able to crush, cut, pierce, or severely pinch operators, and you are very unlikely to be injured if you obstruct the Labware MiniHub while it is in motion.

CAUTION Obstructing the Labware MiniHub will cause an error that requires operator attention. Do not touch any of the moving parts or attempt to move labware from the Labware MiniHub while it is in operation.

CAUTION Always close the system doors or enclosure windows, and make sure the interlock is on before initializing the Labware MiniHub to allow proper function.

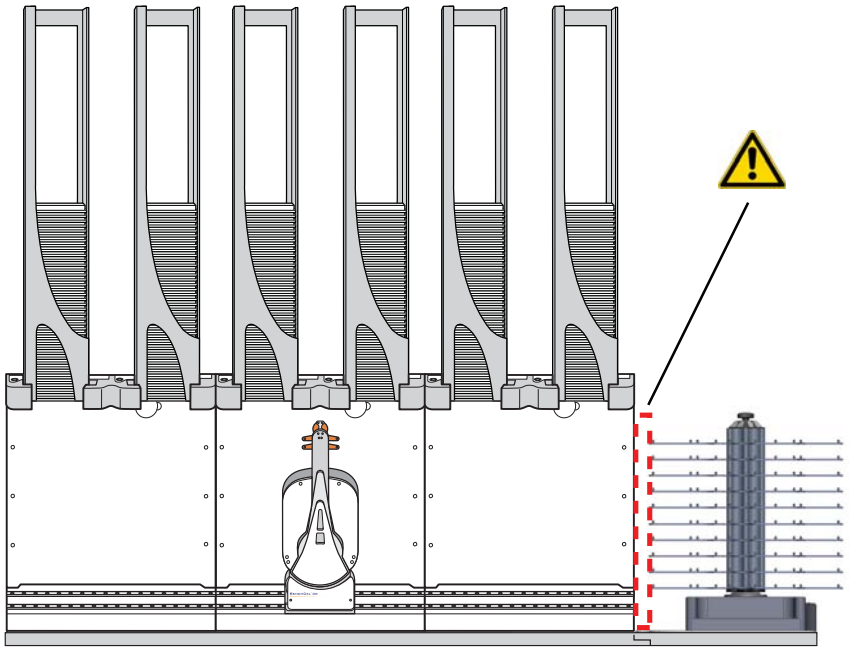
WARNING **Pinch hazard! Be careful to keep your fingers out of the path of the shelves. Keep your fingers out of the area between the bottom-most shelves and the base.**

Figure Labware MiniHub moving parts and potential pinch hazards



WARNING **Pinch hazard! In the BenchCel Workstation, keep your fingers out of the narrow gap between the workstation and the MiniHub shelves.**

Figure Labware MiniHub potential pinch hazard in a BenchCel Workstation



Related information

For information about...	See...
General safety information	“General safety information” on page 2
Safety and regulatory certifications	“Safety and regulatory compliance” on page 4
Safety symbols and labels	“Safety labels” on page 2
Emergency stop	“Emergency stop” on page 6
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2 Laboratory setup requirements

This chapter contains the following topics:

Physical dimensions

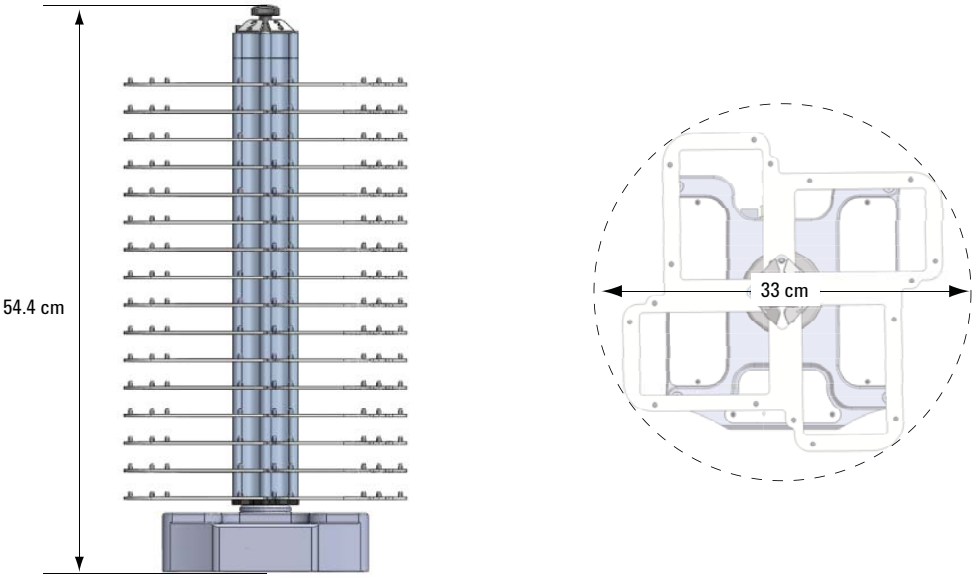
About this topic

This topic presents the physical dimensions of the following:

- Labware MiniHub (system model)
- Labware MiniHub (BenchBot model)
- Labware MiniHub (BenchCel model)
- Power supply

Labware MiniHub (system model)

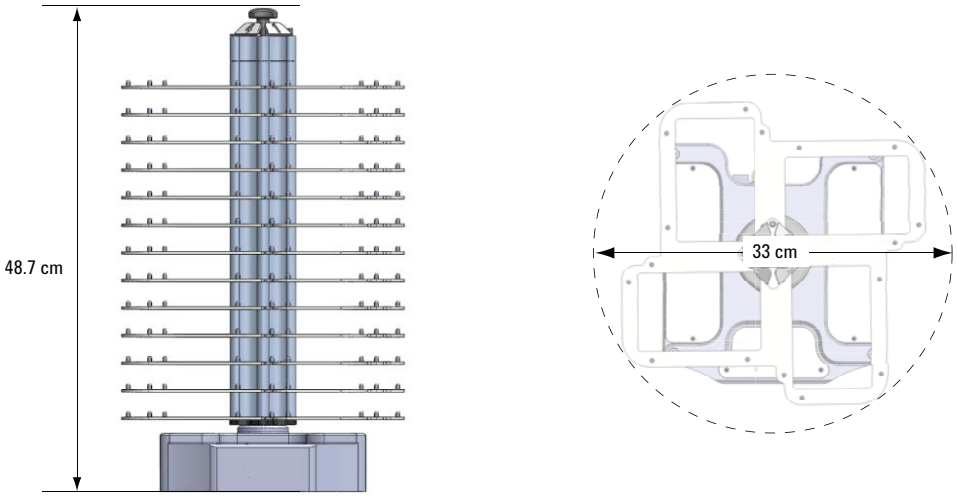
Figure Labware MiniHub side view (left) and top view (right)



Dimension	Value
Height	54.4 cm (21.4 in)
Diameter	33 cm (13 in)
Weight	13 kg (29 lb)

Labware MiniHub (BenchBot model)

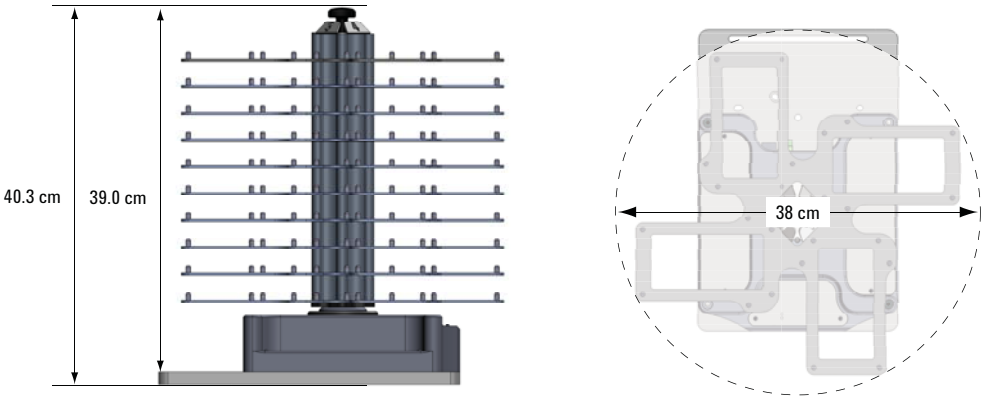
Figure Labware MiniHub side view (left) and top view (right)



Dimension	Value
Height	48.7 cm (19.2 in)
Diameter	33 cm (13 in)
Weight	11 kg (24 lb)

Labware MiniHub (BenchCel model)

Figure Labware MiniHub side view (left) and top view (right)

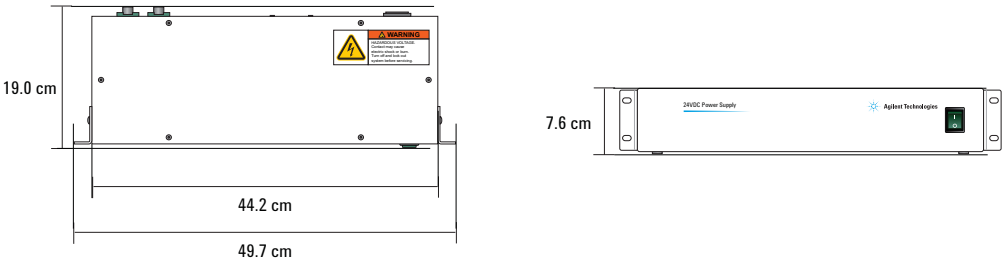


Dimension	Value
Height	39.0 cm (15.4 in)*
Diameter	38 cm (15 in)
Weight	10 kg (21 lb)

* Height with integration plate is 40.3 cm (15.9 in).

Power supply

Figure Power supply top view (left) and front view (right)



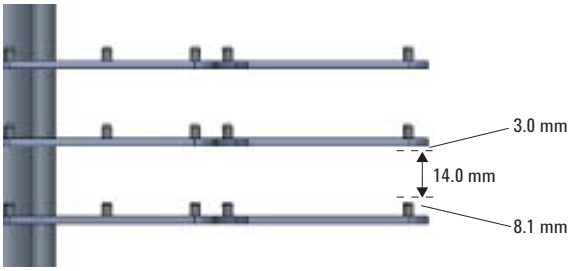
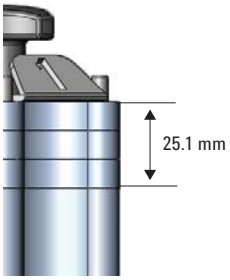
Dimension	Value
Width:	
Without mounting bracket	44.2 cm (17.4 in)
With mounting bracket	49.7 cm (19.6 in)
Depth	19.0 cm (7.5 in)
Height	7.6 cm (3.0 in)
Weight	3.8 kg (8.4 lb)

Power cord: 2.7 m (9.0 ft)
Labware MiniHub cable: 3.0 m (10.0 ft)
Ethernet cable with serial adaptor: 3.0 m (10.0 ft)

Related information

For information about...	See...
Labware specifications	“Labware and shelf pitch specifications” on page 17
Mounting specifications	“Mounting specifications” on page 19
Performance specifications	“Performance specifications” on page 22
Electrical requirements	“Electrical requirements” on page 23
Environmental requirements	“Environmental requirements” on page 24
Computer requirements	“Computer requirements” on page 25

Labware and shelf pitch specifications

Specification	
Maximum number of shelves:	
System model	16
BenchBot model	13
BenchCel model	10
Distance between shelves	14.0 mm with single 25.1-mm spacers 39.1 mm with two 25.1-mm spacers 64.2 mm with three 25.1-mm spacers **IMPORTANT** Actual height of a single spacer is 25.1 mm. However, for optimal performance, 8.1 mm is required to clear the locating pins and 3.0 mm is required beneath the shelf above.  The 8.4-mm spacers are used primarily at the top of the MiniHub to fill the gap between the last 25.1-mm spacer and the cassette cap. The stacking heights are as follows: 8.4 mm with a single 8.4-mm spacer 16.7 mm with two 8.4-mm spacers 25.1 mm with three 8.4-mm spacers 
Labware types	ANSI-compliant labware (2-, 12-, 24-, 96-, 384-well, and deep-well microplates) Tipboxes Tube racks

Specification	
Robot access:	
System model	Landscape or portrait
BenchBot model	Landscape or portrait
BenchCel model	Portrait

Related information

For information about...	See...
Physical dimensions	“Physical dimensions” on page 14
Mounting specifications	“Mounting specifications” on page 19
Performance specifications	“Performance specifications” on page 22
Electrical requirements	“Electrical requirements” on page 23
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Mounting specifications

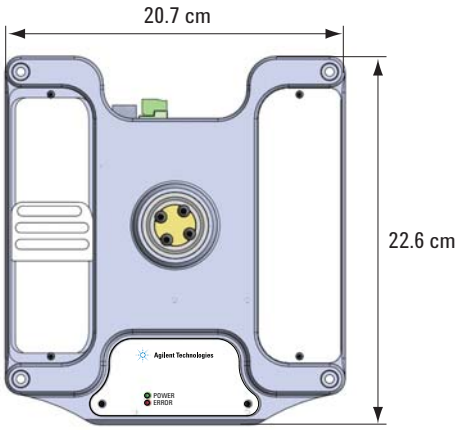
Attachment surface

The Labware MiniHub must be installed vertically on a flat stiff surface that is stable. A deformable and non-stable support will greatly reduce the Labware MiniHub's speed and accuracy, and possibly cause errors.

EU installations only. The stable surface recommendation is required so that the Labware MiniHub installation is compliant with the provisions of the Machinery Directive 2006/42/EC. See Annex 1 of the Machinery Directive for the list of the Essential Health and Safety Requirements (EHSR) that must be met.

Base dimensions

The following diagram shows the overall dimensions of the base.



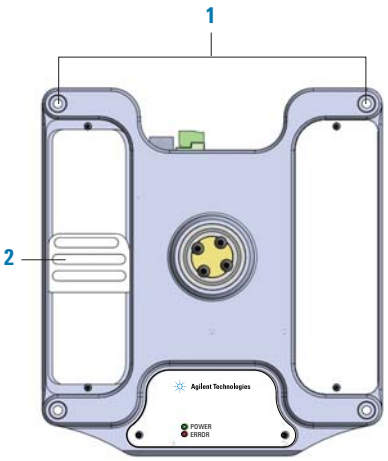
Base mounting specifications

You can mount the base of the Labware MiniHub using one of the following methods:

- Insert four 5-mm socket-head cap screws (supplied) in the holes at the corners of the base (1).
- If the mounting holes in the attachment surface do not align with the four corner holes of the Labware MiniHub base, insert two 6-mm socket-head cap screws (supplied) in the sliding brackets (2). To access the sliding brackets, remove the screws and lift the white cover plates on the top of the base.

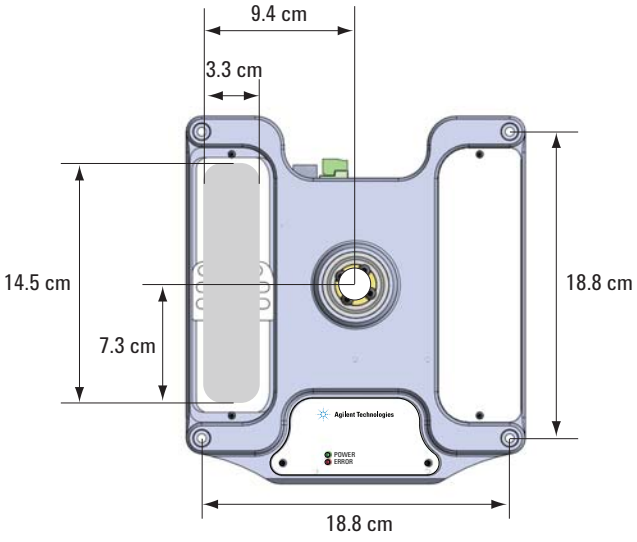
  The following diagram shows the sliding bracket on the left side of the base. The bracket on the right side is concealed by the white cover plate.

Figure Labware MiniHub base (top view) with cover plate removed on the left



Mounting requirement	Measurement
Screw type	M5 x 60 (corners), or M6 x 25 (sliding brackets)
Number of screws	4 (corners), or 2 (sliding brackets)

The following diagram shows the base of the MiniHub and the spacing of the holes for the screws. The shaded region in the sliding-bracket area indicates the zone within which you can insert mounting screws.



Power supply

The power supply can be installed in one of two ways:

- Set on a stable, flat surface.
- Mount it in a standard 19-in rack. The power supply has two mounting brackets as the following diagram shows. The brackets are 2 rack units (or 2U) in overall height.

Figure Labware MiniHub power supply (front view) with mounting brackets

CAUTION Air vents are on the left and right sides of the power supply. Be sure to provide at least 1.3 cm (0.5 in) of clearance on both sides.

Related information

For information about...	See...
Physical dimensions	“Physical dimensions” on page 14
Labware specifications	“Labware and shelf pitch specifications” on page 17
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Environmental requirements	“Environmental requirements” on page 24
Computer requirements	“Computer requirements” on page 25

Performance specifications

Performance	Value
Turn 180° any direction	< 5 s
Payload:	
Per labware	200 g
Maximum - system model (64 labware)	12 800 g
Maximum - BenchBot model (52 labware)	10 400 g
Maximum - BenchCel model (40 labware)	8000 g
Accuracy of position after turn or when stationary	±1 mm

Related information

For information about...	See...
Physical dimensions	“Physical dimensions” on page 14
Labware specifications	“Labware and shelf pitch specifications” on page 17
Mounting specifications	“Mounting specifications” on page 19
Electrical requirements	“Electrical requirements” on page 23
Environmental requirements	“Environmental requirements” on page 24
Computer requirements	“Computer requirements” on page 25

Electrical requirements

Requirement	Value
Voltage	100–240 V~
Frequency	50/60 Hz
Current	3 A
Maximum power consumption	360 W typical
Fuses	*AC power input.* 2 x 4 A, 250 V, time delay *24 V DC power output.* 2 x 12 A, 250 V, time delay *Note:* Only one of the 12-A fuses is required. The second fuse and power output is optional and can be used to support another device, such as a second Labware MiniHub.
Chassis plug	IEC 60320 C14

Related information

For information about...	See...
Physical dimensions	“Physical dimensions” on page 14
Labware specifications	“Labware and shelf pitch specifications” on page 17
Mounting specifications	“Mounting specifications” on page 19
Performance specifications	“Performance specifications” on page 22
Environmental requirements	“Environmental requirements” on page 24
Computer requirements	“Computer requirements” on page 25

Environmental requirements

IMPORTANT The Labware MiniHub must operate within the temperature and humidity specifications stated in the following table.

Operating	Recommended range
Temperature	4–40 °C
Humidity	20–90% RH, non-condensing
Altitude	0–1500 m
Storage (non-operating)	**Recommended range**
Temperature	-20–50 °C
Humidity	0–90% RH, non-condensing
Altitude	0–1500 m

Related information

For information about...	See...
Physical dimensions	"Physical dimensions" on page 14
Labware specifications	"Labware and shelf pitch specifications" on page 17
Mounting specifications	"Mounting specifications" on page 19
Performance specifications	"Performance specifications" on page 22
Electrical requirements	"Electrical requirements" on page 23
Computer requirements	"Computer requirements" on page 25

Computer requirements

About computer requirements

The requirements of the controlling computer depend on the lab automation software you are using. For VWorks software computer requirements, see the VWorks software release notes or the Automation Solutions Knowledge Base at www.agilent.com/lifesciences/automation. For third-party automation software, see the user documentation supplied with the product.

Related information

For information about...	See...
Physical dimensions	"Physical dimensions" on page 14
Labware specifications	"Labware and shelf pitch specifications" on page 17
Mounting specifications	"Mounting specifications" on page 19
Performance specifications	"Performance specifications" on page 22
Electrical requirements	"Electrical requirements" on page 23
Environmental requirements	"Environmental requirements" on page 24

3 Installing the Labware MiniHub

This chapter contains the following topics:

Installation workflow

Workflow

The following table presents the steps for unpacking and installing the Labware MiniHub.

Step	For this task...	See...
1	Install the Labware MiniHub.	One of the following: • "Installing and removing the Labware MiniHub in an automation system" on page 29 • "Installing and removing the Labware MiniHub in a BenchCel Workstation" on page 31
2	Mount the power supply and connect the cables.	"Mounting the power supply and connecting the cables" on page 33
3	Assemble the shelves.	"Assembling the Labware MiniHub shelves" on page 36

Related information

For information about...	See...
Installing the VWorks software	VWorks software release notes
Integrating MiniHub ActiveX control in a third-party lab automation software	*Labware MiniHub User Guide*
Turning on the Labware MiniHub	*Labware MiniHub User Guide*
Setting up the Labware MiniHub in the VWorks software	*Labware MiniHub User Guide*

Installing and removing the Labware MiniHub in an automation system

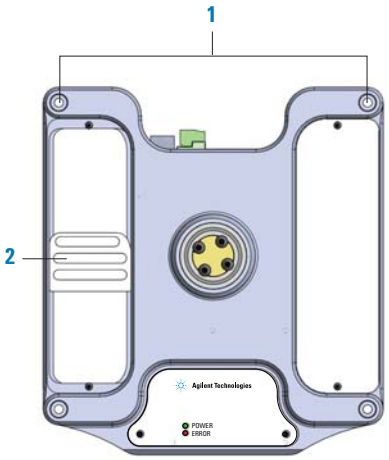
Materials and tools

If you are attaching the Labware MiniHub base using the four corner screw holes (1), make sure you have the following:

- M5 Socket-head cap screws, 4 (supplied with product, G5550-02377)
- 4-mm hex wrench (not supplied)

If you are attaching the Labware MiniHub base using the sliding brackets (2) under the white cover plates, make sure you have the following:

- M6 socket-head cap screws, 2 (supplied with product, G5550-02412)
- 1.5-mm hex wrench (not supplied)
- 5-mm hex wrench (not supplied)



Installing the Labware MiniHub base

When you install the Labware MiniHub, you first attach the Labware MiniHub base to a stable and flat surface, mount the power supply (if desired), then connect the power and communication cables.

Attaching the Labware MiniHub base

To attach the base:

1. Position the Labware MiniHub base on the attachment surface so that the screw holes at the four corners align over the mounting holes in the attachment surface.

   Alternatively, use the 1.5-mm hex wrench to remove the white covers on the base. Move each slider such that at least one screw slot aligns over a mounting hole in the attachment surface.
2. Insert the screws in the holes or adjustable slots.
3. Use the 4-mm hex wrench to tighten the corner screws, or use the 5-mm hex wrench to tighten the screws in the adjustable slots.

Removing the Labware MiniHub base

To remove the Labware MiniHub base:

1. Detach the Labware MiniHub base from the table. Using the 4-mm or 5-mm hex wrench, remove the screws that are holding the base to the attachment surface.
2. Save all screws for reinstallation.

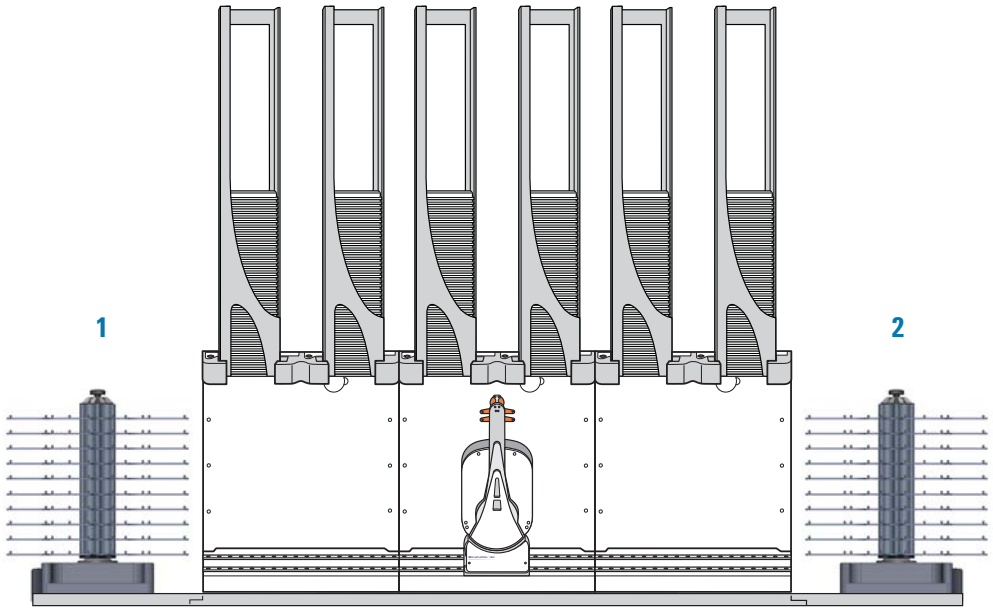
Related information

For information about...	See...
Installing the power supply	"Mounting the power supply and connecting the cables" on page 33
Reconfiguring the Labware MiniHub shelves	"Assembling the Labware MiniHub shelves" on page 36
Turning on the Labware MiniHub	*Labware MiniHub User Guide*
Packing the Labware MiniHub	*Labware MiniHub Unpacking Guide*

Installing and removing the Labware MiniHub in a BenchCel Workstation

Integrating the MiniHub

You can integrate the MiniHub on either the left side (1) or right side (2) of the BenchCel device. For integration instructions, see the *BenchCel Microplate Handling Workstation User Guide*.



The integration plate shown in the diagram is included with the product. Alternatively, a variety of risers can be installed under the MiniHub to meet different configuration requirements. For more information, contact Automation Solutions Customer Service.

When integrating the MiniHub, position the MiniHub so that the indicator lights are on the front side and the connectors at the base are on the back side. This orientation allows you to see the indicator lights clearly and the cables are out of the way on the back side.

You can also position the MiniHub so that the indicator lights face the BenchCel device and the connectors at the base face on the opposite side from the BenchCel device. This orientation might be desirable if you have a second BenchCel device on the back side and need to maintain the cables on the side.

Removing the MiniHub

To remove the MiniHub from a BenchCel Workstation, be sure to unlock the integration plate and remove the MiniHub and integration plate assembly. For instructions, see the *BenchCel Microplate Handling Workstation User Guide*.

Related information

For information about...	See...
Integrating the Labware MiniHub in a BenchCel Workstation	*BenchCel Microplate Handling Workstation User Guide*
Reconfiguring the Labware MiniHub shelves	"Assembling the Labware MiniHub shelves" on page 36
Turning on the Labware MiniHub	*Labware MiniHub User Guide*
Packing the MiniHub	*Labware MiniHub Unpacking Guide*

Mounting the power supply and connecting the cables

Materials and tools

Make sure you have the following supplied materials and tools:

- 18-8 SS pan-head cross-recess machine screws, 4 (G5550-09078)
- M05 split lock washers, 4 (G5550-02453)
- M05 flat washers, 4 (G5550-02439)
- Power supply power cord (part number varies by country)
- Labware MiniHub base power cable (G5508-60005)
- Ethernet cable with serial adaptor (G5550-09002, G5550-21721)
- ESD grounding strap (G5508-60028)

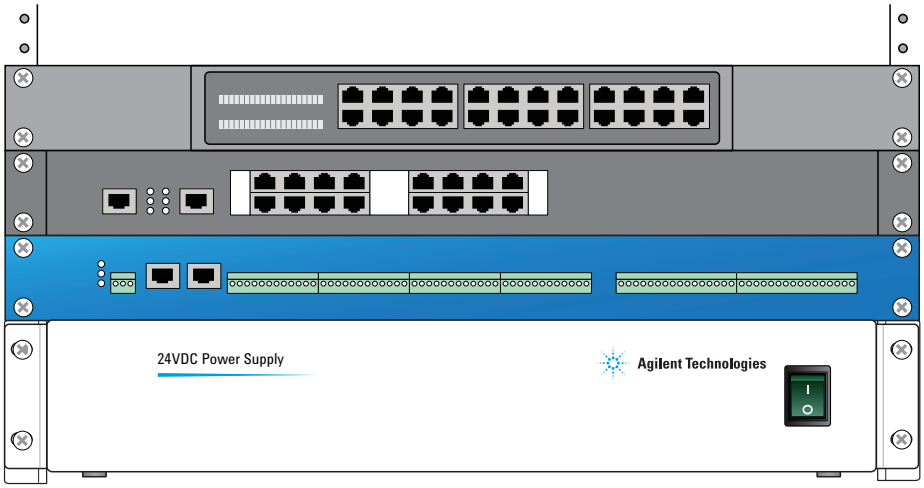
In addition, make sure you have a #2 cross-head screw driver (not supplied).

Mounting the power supply

WARNING **Use only the supplied power cord to connect the Labware MiniHub to the power source. Using other power cords can cause damage to the device or injury to the user during operation.**

You can set the power supply on a stable, flat surface. Alternatively, you can use the supplied mounting brackets to mount the power supply on a standard 19-inch rack. The following diagram shows an example of how you can mount the power supply in a system.

Note: The mounting brackets are installed on the power supply.

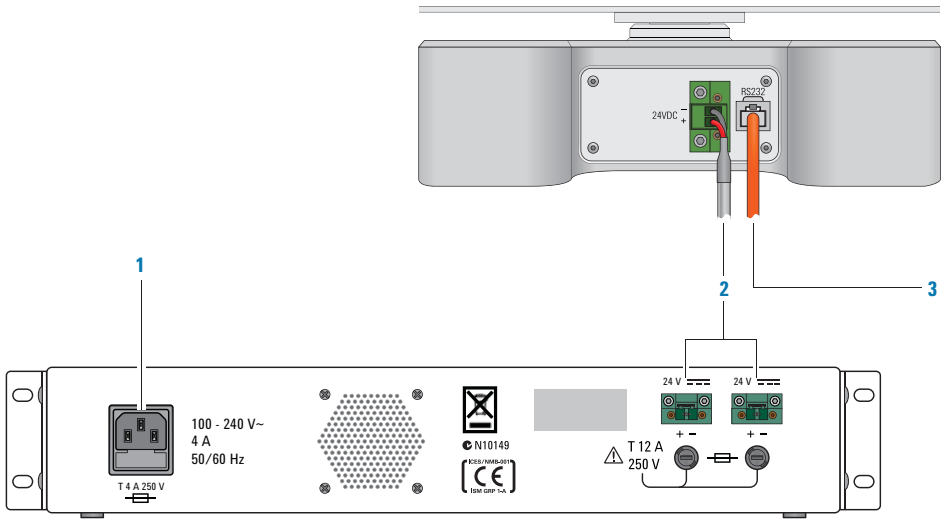


To mount the power supply on a standard mounting rack:

1. Insert each pan-head screw through a split-lock washer first, and then through a flat washer.
2. Align two holes in each mounting bracket with two holes in the rack.
3. Insert the screw-washer assembly into each hole and tighten using the screwdriver.

Connecting the cables

To connect the cables:



1. Use the supplied power cord to connect the Labware MiniHub power supply to the power source.
2. Use the supplied MiniHub base power cable to connect the Labware MiniHub to the power supply. Use one of the connectors on the back of the power supply. (The second connector can be used to support another device, such as a second MiniHub.)
3. Use the supplied Ethernet cable to connect the Labware MiniHub to the controlling computer. Use one of the following methods:
   - Connect the Labware MiniHub to the controlling computer directly. Be sure to connect the serial-adaptor end of the cable to the computer.
   - Connect the Labware MiniHub to a serial communication hub that is connected to the controlling computer.

Connecting the ESD grounding strap

For Electrostatic Discharge (ESD) compliance and protection, the Labware MiniHub requires either bolting to a grounded, conductive surface (such as a metal workbench or table top) or using the supplied external ESD grounding strap to connect the chassis to a grounded surface.

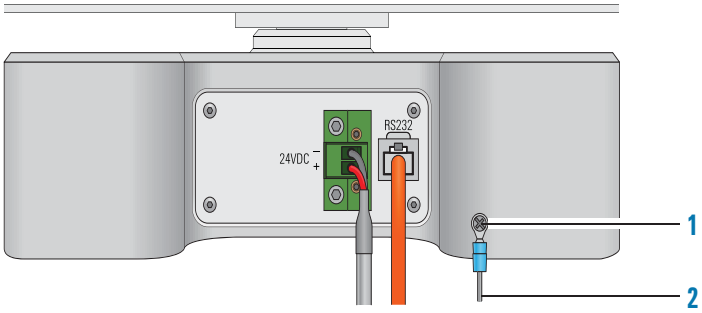
IMPORTANT Extending the ESD grounding strap by connecting it to another grounding wire may reduce its ESD protection capabilities.

The supplied ESD grounding strap is installed on the Labware MiniHub base. If, for some reason, it was removed, you must reconnect the strap before operating the Labware MiniHub. This section describes how to connect the strap.

WARNING **To prevent potential injury, always turn off the Labware MiniHub and shut down the system before connecting or disconnecting the ESD grounding strap.**

WARNING **To prevent potential injury, always disconnect the power cord from the Labware MiniHub power supply before connecting or disconnecting the ESD grounding strap.**

To connect the ESD grounding strap:



1 Using the screw driver, loosen the grounding screw at the base, place the loop at one end of the grounding strap behind the screw, and tighten the screw. The strap should be connected securely.

2 Connect the free end of the grounding strap to a grounded surface or wire.

Connecting to the system-wide emergency-stop circuit

If the MiniHub is integrated in an automation system, Agilent Technologies recommends that you install a system-wide emergency stop button to cut power to the MiniHub and all devices simultaneously. You can connect the MiniHub power supply to the power source that controls the system-wide emergency-stop circuit.

For more safety information, see "Safety guidelines" on page 1.

Removing the power supply

To remove the power supply from the mounting bracket:

1 Disconnect and remove the following:

- Power cable
- MiniHub base power cable
- Ethernet cable with serial adaptor

Be sure to store the cables after you remove them.

2 Leave the ESD grounding strap on the MiniHub base.

3 Using the screw driver, remove the screws that are holding the power supply to the mounting bracket. Be sure to keep all of the screws and washers that were removed.

Related information

For information about...	See...
Turning on the Labware MiniHub	*Labware MiniHub User Guide*
Starting up the automation system	Automation system user documentation
Setting the MiniHub home position	*Labware MiniHub User Guide*
Setting the robot teachpoints	*Labware MiniHub User Guide*
Packing the Labware MiniHub	*Labware MiniHub Unpacking Guide*
Using the MiniHub ActiveX control	*Labware MiniHub User Guide*
Setting up the Labware MiniHub in the VWorks software	*Labware MiniHub User Guide*
Configuring the Labware MiniHub in MiniHub Diagnostics	*Labware MiniHub User Guide*
Using MiniHub Diagnostics	*Labware MiniHub User Guide*

Assembling the Labware MiniHub shelves

About this topic

The Labware MiniHub is shipped to your laboratory disassembled. This topic explains how to assemble the hub.

You can also use the procedure in this topic to reconfigure the shelves to meet your application needs.

Before you start

WARNING Always turn off the Labware MiniHub and shut down the system before reconfiguring the Labware MiniHub.

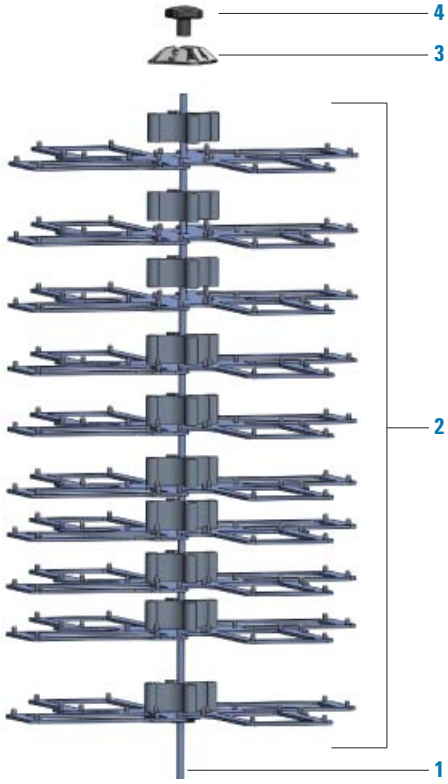
WARNING Always disconnect the power cord from the Labware MiniHub power supply before reconfiguring the Labware MiniHub.

If you are reconfiguring the shelves after the Labware MiniHub has already been in operation:

1. Turn off the automation system or workstation. See the automation system or workstation user guide for instructions.
2. Turn off the Labware MiniHub. See *Labware MiniHub User Guide*.
3. Disconnect the power cord from the Labware MiniHub power supply.

Procedure

To assemble the shelves:

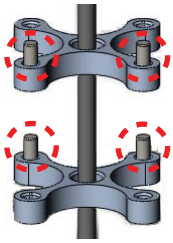


1 Insert the rod into the base of the MiniHub and turn clockwise to tighten.

2 Add shelves and spacers according to your requirements.

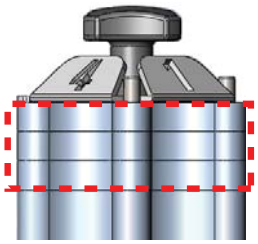
When adding the shelves and spacers, make sure:

- A shelf sits at the bottom of the assembly.
- The spacer alignment pins are at opposing positions with each layer, as shown.



- The shelves are correctly aligned and seated securely. Use the spacer alignment pins to ensure correct alignment.

- If you are using a subset of the shelves, you can add the 8.4-mm spacers at the top of the assembly to fill the space between the top-most 25.1-mm spacer and the cassette. (You do not need to add the 8.4-mm spacers if all of the shelves are used.)



You can add two or more 25.1-mm spacers between shelves to accommodate tall labware. (In this case, some shelves will not be used.) The highest shelf you can install depends on the maximum access height of the automation system robot and the MiniHub model.

3 Place the cassette cap at the top of the rod.

4 Add the black knob at the top of the rod and turn clockwise to tighten it.

To reconfigure the shelves:

1 Turn the black knob at the top of the Labware MiniHub counterclockwise and remove it.

2 Lift and remove the cassette cap.

3 Lift and remove the spacers and shelves from the rod.

4 If you are replacing the threaded rod:

   a Turn the rod counterclockwise to remove it from the base.

   b Insert the new rod at the center of the base and turn it clockwise to tighten it.

5 Add spacers and shelves according to your requirements.

6 Place the cassette cap at the top of the rod.

7 Place the black knob at the top of the rod and turn clockwise to tighten it.

Related information

For information about...	See...
Turning on the Labware MiniHub	*Labware MiniHub User Guide*
Starting up the automation system	Automation system user documentation
Setting up the Labware MiniHub in the VWorks software	*Labware MiniHub User Guide*
Using the MiniHub ActiveX control	*Labware MiniHub User Guide*

Agilent Technologies

Safety and Installation Guide

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