

G5581A Microplate Labeler

User Guide



Original Instructions

Notices

Manual Part Number

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Safety Notices

WARNING

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.

CAUTION

A **CAUTION** 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 damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

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Preface

This guide describes how to use the Microplate Barcode Labeler to print and apply labels automatically to your labware. The Microplate Labeler can print linear and two-dimensional barcodes and human-readable text fields.

This preface contains the following topics:

- [“About this guide” on page vi](#)
- [“Accessing Agilent Automation Solution user guides” on page viii](#)

About this guide

Who should read this guide

This user guide is for people with the following job roles:

Job role	Responsibilities
Installer	Unpacks, installs, and tests the device before it is used.
Integrator	Configures hardware and writes software.
Lab manager, administrator, or technician	<ul style="list-style-type: none">Manages the automation system that contains the deviceDevelops the applications that are run on the systemDevelops training materials and standard operating procedures for operators
Operator	Performs the daily production work on the device and solves routine problems.

What this guide covers

This guide provides descriptions of the Microplate Labeler and procedures for installation, setup, operation, and maintenance of the device. You use the Microplate Labeler Diagnostics software to set up the device, create label formats, and troubleshoot the device. You can access Microplate Labeler Diagnostics using the VWorks Automation Control software or the Microplate Labeler ActiveX controls.

What this guide does not cover

This guide does not provide instructions for the VWorks software, ActiveX controls, or third-party software. For more information about these topics, see ["Related guides" on page vii](#).

What is new in this revision

Description	See
Added information about the cab SQUIX printer.	"Hardware overview" on page 12 "Printer overview" on page 15 "Using the cab SQUIX printer touchscreen" on page 133

Software version

This guide documents Microplate Labeler Diagnostics version 17.1.0 or later.

Related guides

Use this guide in conjunction with the following:

- [Automation Solutions Products General Safety Guide](#). Provides general safety information and describes potential safety hazards that you might encounter when using Automation Solutions products. A copy of this safety guide is included with your shipment.
- [G5581A Microplate Labeler Unpacking Guide](#). Describes how to unpack the Microplate Labeler from the shipping containers.
- [G5581A Microplate Labeler Media Loading Guide](#). Describes how to load the labels and ribbon in the printer on the Microplate Labeler.
- [VWorks Automation Control Setup Guide](#). Explains how to define labware and labware classes, liquid classes, and pipetting techniques, and how to track and manage labware in storage.
- [VWorks Automation Control User Guide](#). Explains how to create protocols, set task parameters, and run protocols. Use this guide to set the parameters for the Print and Apply task when running a labeling protocol.
- [Microplate Labeler ActiveX User Guide](#). Describes the ActiveX controls for the Microplate Labeler.

If the Microplate Labeler is a device in a third-party system, see the relevant third-party system guides.

Related topics

For more information about...	See...
Reporting problems	"Reporting problems" on page 137
Other devices	"Accessing Agilent Automation Solution user guides" on page viii
Microplate Labeler safety	"Safety guidelines" on page 1

Accessing Agilent Automation Solution user guides

About this topic

This topic describes the different formats of user information and explains how to access it for the Agilent Automation Solutions products.

Where to find user information

The Automation Solutions user information is available in the following locations:

- *Knowledge base.* The help system that contains information about all the Automation Solutions products is available from the Help menu within the VWorks software.
- *PDF files.* The PDF files of the user guides are installed with the VWorks software and are on the software CD that is supplied with the product. A PDF viewer is required to open a user guide in PDF format. You can download a free PDF viewer from the internet. For information about using PDF documents, see the user documentation for the PDF viewer.
- *Agilent website.* You can search the online knowledge base or download the latest version of any PDF file from the Agilent website at www.agilent.com/chem/askb.

Accessing safety information

Safety information for the Agilent Automation Solutions devices appears in the *Automation Solutions Products General Safety Guide* and in the corresponding device safety guide or user guide.

You can also search the knowledge base or the PDF files for safety information.

Using the knowledge base

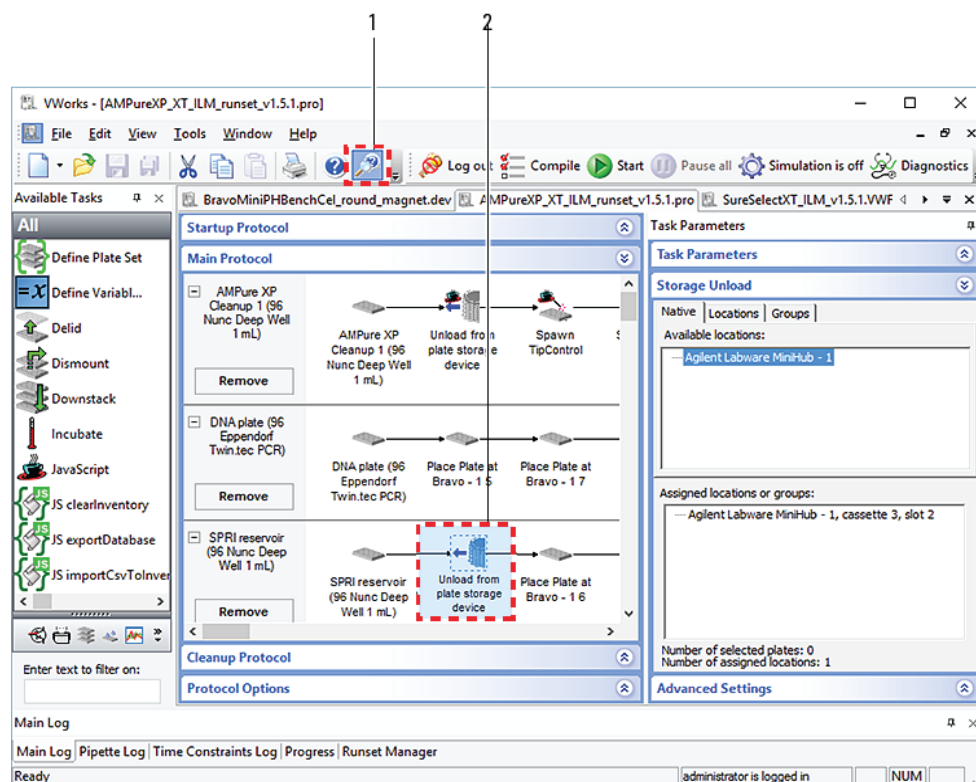
Knowledge base topics are displayed using web browser software such as Microsoft Internet Explorer and Mozilla Firefox.

Note: If you want to use Internet Explorer to display the topics, you might have to allow local files to run active content (scripts and ActiveX controls). To do this, in Internet Explorer, open the **Internet Options** dialog box. Click the **Advanced** tab, locate the **Security** section, and select **Allow active content to run in files on my computer**.



To open the knowledge base, do one of the following:

- From within VWorks software, select **Help > Knowledge Base** or press F1.
- From the Windows desktop, do one of the following:
 - *Windows 10.* Select **Start > All Apps > Agilent Technologies > VWorks Knowledge Base**.
 - *Windows 7.* Select **Start > All Programs > Agilent Technologies > VWorks > User Guides > VWorks Knowledge Base**.

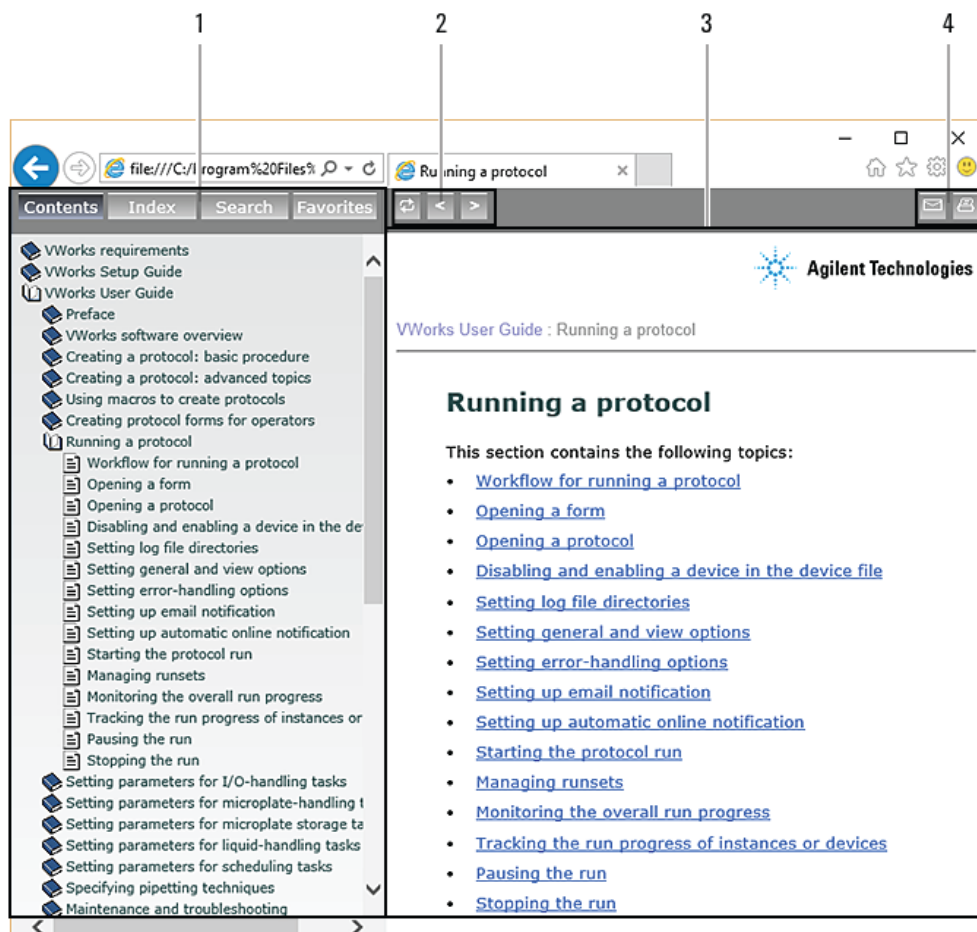
Opening the help topic for an area in the VWorks window



To access the context-sensitive help feature:

- 1 In the main window of the VWorks software, click the help button . The pointer changes to . Notice that the different icons or areas are highlighted as you move the pointer over them.
- 2 Click an icon or area of interest. The relevant topic or document opens.

Features in the Knowledge Base window



Item	Feature
1	Navigation area. Consists of four tabs: <ul style="list-style-type: none"> Contents. Lists all the books and the table of contents of the books. Index. Displays the index entries of all of the books. Search. Allows you to search the Knowledge Base (all products) using keywords. You can narrow the search by product. Favorites. Contains bookmarks you have created.
2	Navigation buttons. Enable you to navigate through the next or previous topics listed in the Contents tab.
3	Content area. Displays the selected online help topic.
4	Toolbar buttons. Enable you to print the topic or send documentation feedback by email.



1 Safety guidelines

Before installing and using the Microplate Labeler, you must be familiar with the potential safety hazards and how to avoid them.

This chapter contains the following topics, which describe the safety information for the Microplate Labeler:

- [“General safety information” on page 2](#)
- [“Safety and regulatory compliance” on page 3](#)
- [“Stopping in an emergency” on page 5](#)
- [“Potential safety hazards” on page 6](#)

General safety information

Before installing and using the device

Before using the Microplate Labeler, make sure that you are properly trained in:

- General laboratory safety
- The correct and safe operation of the Microplate Labeler
- The correct and safe operation of lab automation systems or components used in combination with the Microplate Labeler

General safety precautions

For the general safety precautions, the intended product use statement, and the list of safety labels, see the [Automation Solutions Products General Safety Guide](#).

Related information

For information about...	See...
Precautions for potential hazards specific to the Microplate Labeler	"Potential safety hazards" on page 6
Regulatory compliance	"Safety and regulatory compliance" on page 3

Safety and regulatory compliance

Compliance standards

The Microplate Labeler complies with the applicable EU Directives and bears the CE mark. See the Declaration of Conformity or Declaration of Incorporation, as applicable, for details. The Microplate Labeler is designed to comply with the regulations and standards listed in the following table.

Regulatory Compliance	Standard
EMC	
European Union	EMC Directive 2014/30/EU
	IEC 61326-1:2012 / EN 61326-1:2013
Canada	ICES/NMB-001:2006
Australia/New Zealand	AS/NZS CISPR 11:2011
RoHS	
European Union	RoHS Directive 2011/65/EU
Safety	
European Union	Machinery Directive 2006/42/EC
	Low Voltage Directive 2014/35/EU
	IEC 61010-1:2010/EN 61010-1:2010
	IEC 61010-2-081:2015/EN 61010-2-081:2015
Canada	CAN/CSA-C22.2 No. 61010-1-12
	CAN/CSA-C22.2 No. 61010-2-081-15
USA	ANSI/UL 61010-1-2012
	ANSI/UL 61010-2-081:2015

Electromagnetic compatibility

If the Microplate Labeler 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.

South Korea EMC Declaration

The following EMC declaration applies to:

- 1 All models that were registered on or after 7 December 2016, but
- 2 Not to models included in a product family or series that was registered before 7 December 2016 (even if the model was added to the product family or series on or after 7 December 2016).

EMC declaration for South Korea

This equipment has been evaluated for its suitability for use in a commercial environment. When used in a domestic environment, there is a risk of radio interference.

EMC 선언

다음 EMC 선언은

- 1 2016년 12월 7일 자 또는 이후에 등록된 모든 모델은,
- 2 2016년 12월 7일 이전에 등록된 제품군 또는 시리즈를 포함한 모델은 2016년 12월 7일 자 또는 이후에 제품군 또는 시리즈에 추가되었을지라도 적용 되지 않습니다

사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

※ 사용자 안내문은 " 업무용 방송통신기자재 "에만 적용한다 .

Sound emission declaration

Sound pressure: $L_p < 70$ dB according to EN ISO 779:2010.

Schalldruckpegel: $L_p < 70$ dB nach EN ISO 779:2010.

Related information

For information about...	See...
General precautions, intended use statement, and safety labels	Automation Solutions Products General Safety Guide
Potential hazards	"Potential safety hazards" on page 6
Stopping in an emergency	"Stopping in an emergency" on page 5

Stopping in an emergency

Emergency stops

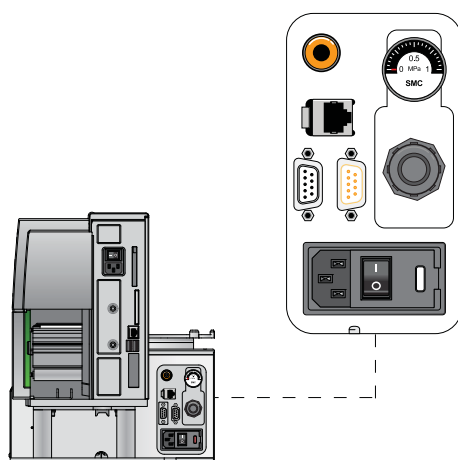
To stop in an emergency:

- 1 Unplug the power cord from the Microplate Labeler or set the power switch to off (O).

Make sure that the point at which the detachable power cord is connected to the Microplate Labeler is clear from clutter and that it is accessible at all times.

- 2 Turn off the air supply.

Figure Microplate Labeler power entry (rear view)



If the Microplate Labeler is integrated in an automation system, follow the emergency-stop protocol for that system.

Related information

For information about...

General safety guidelines

Potential hazards

See...

[Automation Solutions Products General Safety Guide](#)

["Potential safety hazards" on page 6](#)

Potential safety hazards

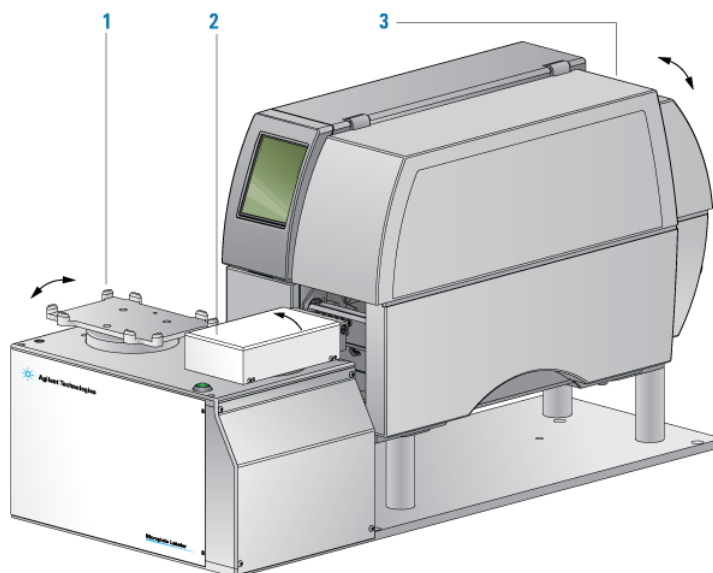
About this topic

This topic describes potential hazards that you can encounter when using the Microplate Labeler.

Mechanical hazards

The Microplate Labeler contains the following moving parts.

Figure Microplate Labeler moving parts



Item	Description
1	<i>Plate stage.</i> Automatically rotates side to side during labeling to present the long and short sides of a microplate to the applicator head.
2	<i>Applicator head.</i> Automatically rotates between the printer and the plate stage to apply the barcode labels.
3	<i>Printer.</i> Contains various parts that move automatically during a print run. Keep the cover closed while the device is operating.

WARNING

Pinch hazard! Do not reach between the plate stage and applicator head or between the applicator head and the printer while the device is on.

WARNING

Pinch hazard! Use care when closing the printer cover. Keep clear of the cover hinges and do not reach into the swivel range of the cover. If you operate the printer with the cover open or with the cover removed, ensure that you keep clear of the exposed rotating parts.

Burn hazard

WARNING

The printer can become hot while printing. Do not touch the printer components during operation. Allow the printer to cool down before changing the media or cleaning the printer components.

Related information

For more information about...	See...
General safety	"General safety information" on page 2
Locations of hardware components	"Hardware overview" on page 12
Site laboratory requirements	"Laboratory requirements" on page 31
Reporting problems with the Microplate Labeler	"Reporting problems" on page 137

1 Safety guidelines

Potential safety hazards



2 Introduction to the Microplate Labeler

This chapter provides the background information required to successfully operate the Microplate Labeler.

The topics are:

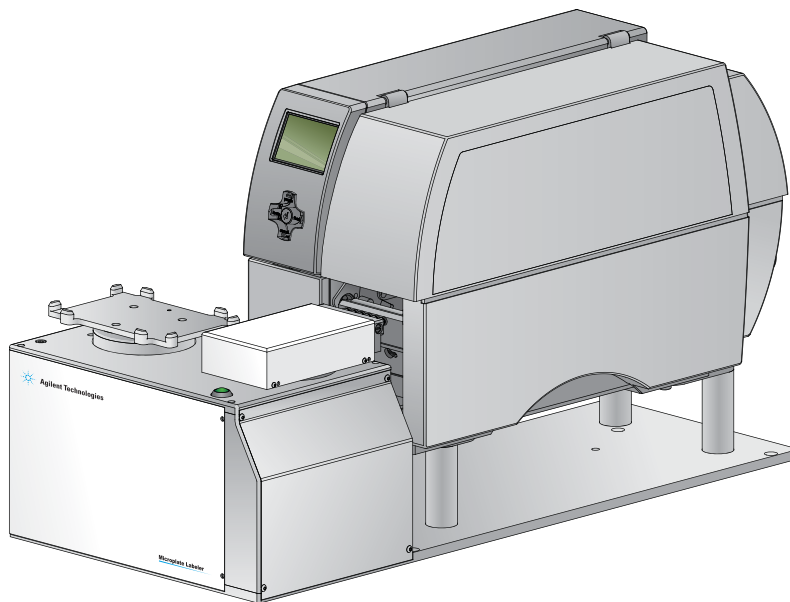
- [“About the Microplate Labeler” on page 10](#)
- [“Hardware overview” on page 12](#)
- [“Overview of the controlling software” on page 20](#)
- [“Microplate labeling tips” on page 22](#)
- [“Labware considerations” on page 22](#)
- [“Introduction to microplate labels and barcodes” on page 25](#)
- [“How the device applies a label” on page 27](#)
- [“Overall setup workflow” on page 28](#)

About the Microplate Labeler

Description

The Microplate Labeler prints labels and applies them to labware.

Figure Microplate Labeler



You can create and apply the same or a different label on up to four sides of a microplate. Each label can include up to six fields, including a barcode field and human-readable text fields.

Figure Microplate (side view) with barcode label



An optional barcode reader can verify that the barcode has been printed and applied correctly, and can be used to clone an existing barcode.

System configuration variations

A Microplate Labeler can be used in the following configurations:

- Integrated in a BenchCel workstation
- As a standalone device
- Integrated with a third-party lab automation system

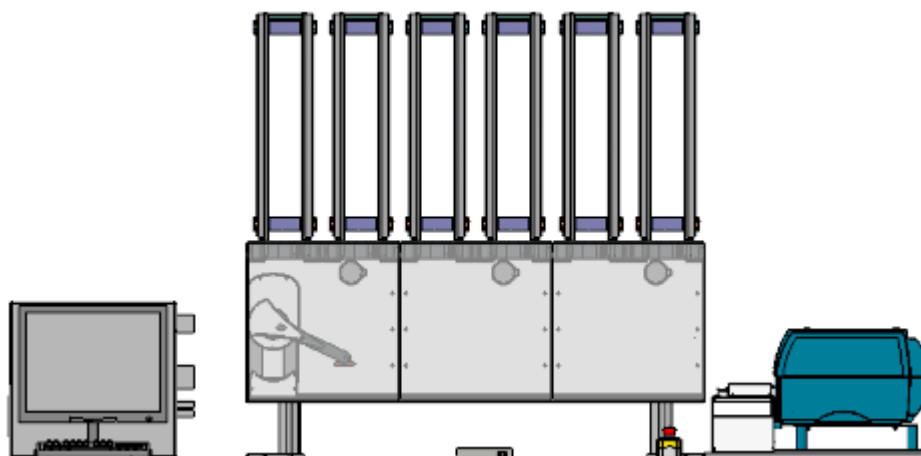
Integrated in an Agilent BenchCel Workstation

When the Microplate Labeler is integrated with a BenchCel Workstation:

- The VWorks software controls the device to perform labeling protocols automatically.

- The BenchCel robot automatically moves the microplates to and from the Microplate Labeler plate stage.

Figure BenchCel Workstation integrated with Microplate Labeler (right)



Standalone Microplate Labeler

When used as a standalone device:

- The VWorks software controls the device to perform labeling protocols automatically.
- The operator places a microplate on the plate stage, presses the green button to perform the print-and-apply operation, and then replaces the labeled microplate with the next microplate to be labeled.

IMPORTANT

The Microplate Labeler is designed to generate printed adhesive labels that are automatically applied to microplates. Although it is possible to print a single test label, manually peel the label off the backing, and place the label on a microplate by hand, printing of multiple labels for manual application is not supported for a standalone Microplate Labeler.

Integrated in a third-party lab automation system

When the Microplate Labeler is integrated in a third-party lab automation system, the third-party software uses the Microplate Labeler ActiveX controls to perform labeling protocols.

Related topics

For information about...	See...
Instrument control software	"Overview of the controlling software" on page 20
Workflows for set up and use	"Overall setup workflow" on page 28
ActiveX controls	Microplate Labeler ActiveX User Guide

Hardware overview

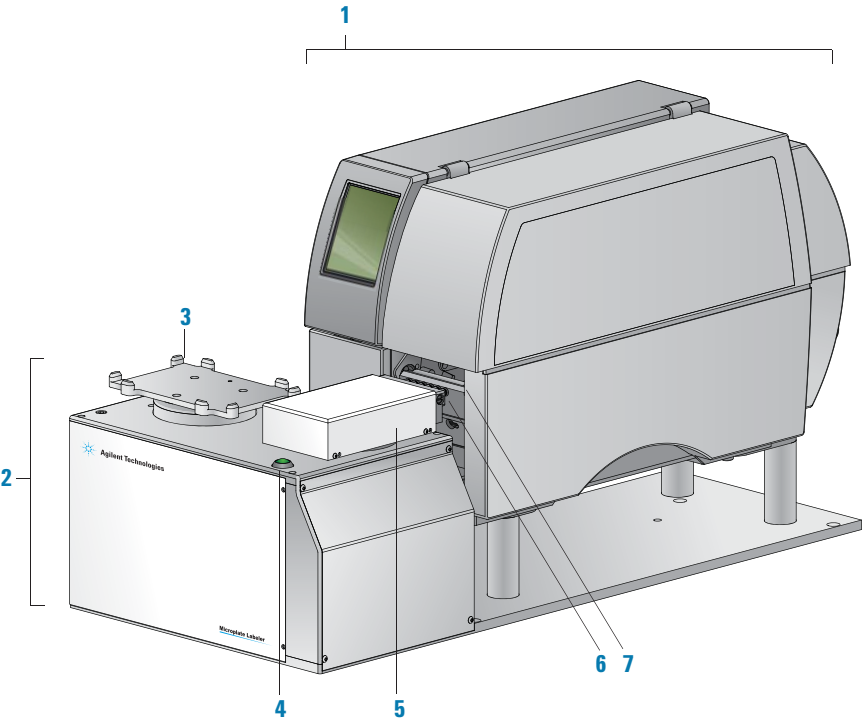
About this topic

This topic describes the Microplate Labeler hardware features, including the optional barcode reader.

Front view

The Microplate Labeler is comprised of a barcode applicator and label printer assembled on a baseplate.

Figure Microplate Labeler components (front view)



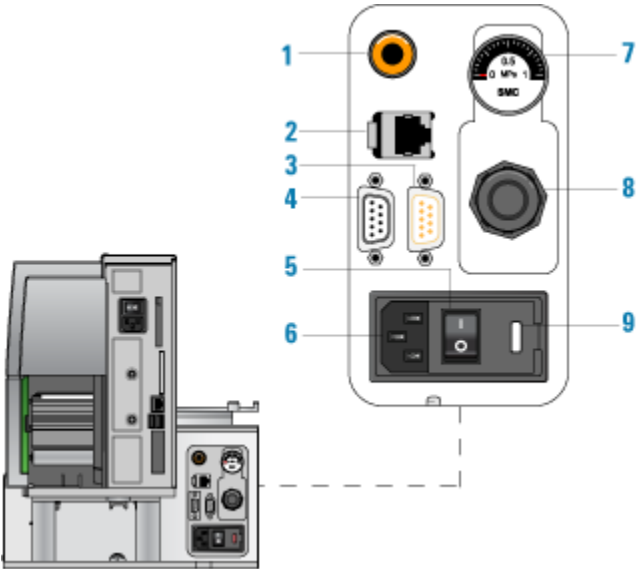
Item	Feature	Description
1	Printer	<p>Prints a label (600 dpi) and pauses when the label reaches the peelbar to allow the applicator head to retrieve the printed label. The printer supports the printing of linear or two-dimensional (2D) barcodes.</p> <p>A Microplate Labeler that is fitted with the cab SQUIX model printer has a touchscreen. For details, see "Using the cab SQUIX printer touchscreen" on page 133.</p> <p>The cab A2+ model printer has a display and navigation pad. For details, see "Using the cab A2+ printer display and navigator pad" on page 135.</p>
2	Applicator	<p>Contains the plate stage, applicator head, green button, electronics, and the connection panel (back side) for the device.</p>

Item	Feature	Description
3	Plate stage	<p>Provides a platform to support a plate delivered by a robot or a person.</p> <p>The plate stage rotates side to side to enable labeling on all four sides of a microplate. The plate stage rotation also allows the optional barcode reader to read any side of a microplate.</p> <p>The plate stage can move up and down to provide a choice of two vertical labeling positions to accommodate labware of varying heights.</p> <p>IMPORTANT If you purchased a standalone Microplate Labeler and later decide to integrate the device with a BenchCel Workstation, a different type of plate stage may be required. Contact Agilent Automation Solutions Technical Support for more information.</p>
4	Green button	Starts a print-and-apply operation for printing test labels.
5	Applicator head	Rotates between the printer and the plate stage. Uses vacuum pads (suction cups) to pick up a printed label from the printer and apply the label to a microplate on the plate stage.
6	Vacuum pads	Uses vacuum to pick up a label from the printer and uses compressed air to apply the label to a microplate on the plate stage.
7	Printer peelbar	Provides a platform for presenting each label to the applicator head vacuum pads. As the label strip travels over the peelbar, each label lifts off the label backing slightly to allow the applicator head to pick up the label.

Connection panel (back view)

The Microplate Labeler connection panel is on the back of the applicator, next to the printer.

Figure Microplate Labeler connection panel (back view)



Item	Feature	Description
1	Air supply port	Connects to a compressed-air source. The device uses compressed air to: <ul style="list-style-type: none">Move the plate stage up and downRotate the applicator head side to sideExtend and retract the applicator headCreate a vacuum that the applicator head uses to pick up labels from the printerApply labels to a microplate
2	Ethernet port	Connects an Ethernet cable from the controlling computer to the Microplate Labeler for communication. IMPORTANT Ethernet is the recommended mode of communication. If you connect to the Microplate Labeler using the Ethernet port, you do not use the serial port.
3	Barcode reader port	Connects the cable from the optional barcode reader to the Microplate Labeler for communication.

Item	Feature	Description
4	Serial port	<p>Connects a serial cable from the controlling computer to the Microplate Labeler to provide serial communication.</p> <p>You can use the 1.8-m (6-ft) serial-communications cable (beige) provided in the Microplate Labeler utility kit.</p> <p><i>Note:</i> If you connect to the Microplate Labeler using the serial port, you do not use the Ethernet port.</p>
5	Power switch	Turns on (I) or off (O) the power.
6	AC power port	Connects the power cable.
7	Pressure gauge	Indicates the regulated air pressure.
8	Air pressure regulator	Regulates the incoming air pressure to ensure that the device's internal components are not exposed to air pressure that is too high.
9	Fuse holder	Houses the electrical fuse.

Printer overview

CAUTION

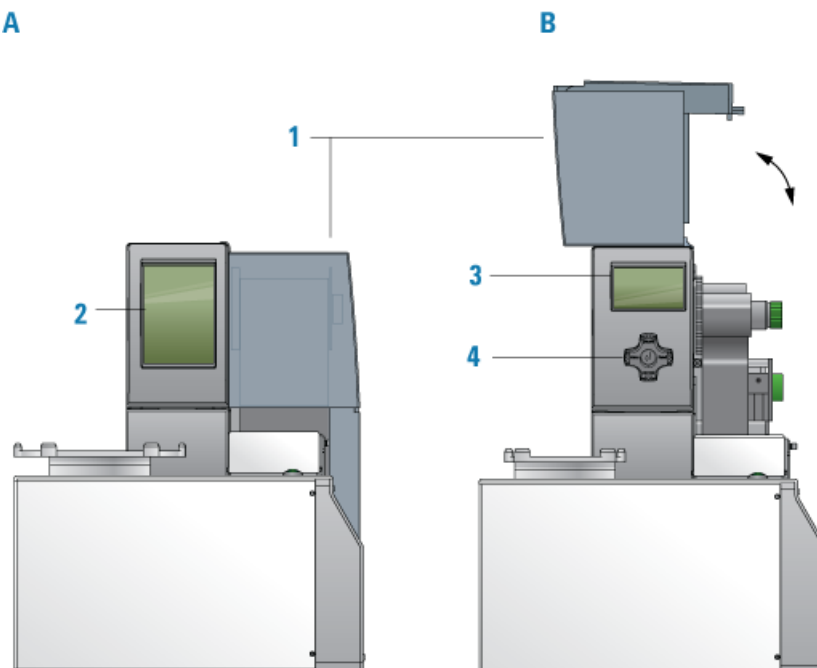
Do not use the touchscreen or navigator pad to adjust the printer settings unless directed to do so by Agilent Automation Solutions Technical Support. Using the printer touchscreen (cab SQUIX) or navigator pad (cab A2+) to change the printer settings can cause the Microplate Labeler to fail. The printer has been specially configured as part of the Microplate Labeler.

IMPORTANT

The printer display must show the Ready message before you can initialize the device. During operation, the software displays operator messages and error messages on the computer screen.

Printer front view

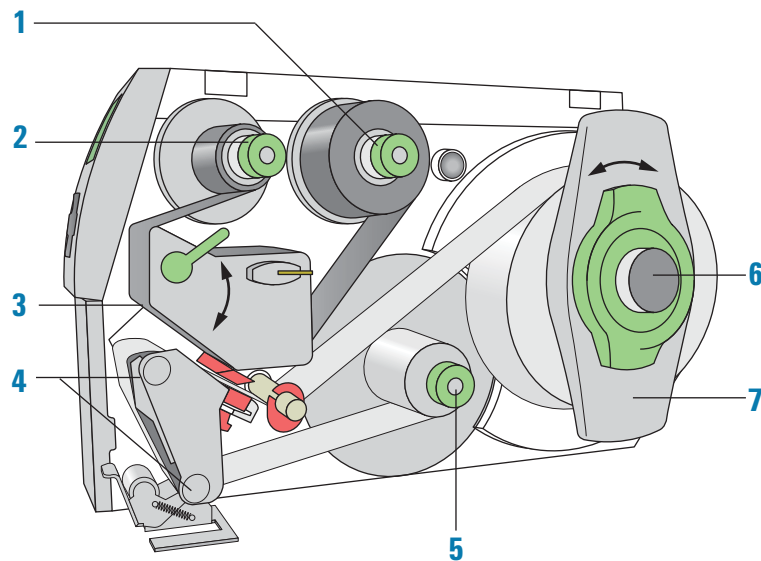
Figure Printer front view (A) cab SQUIX printer, (B) cab A2+ printer



Item	Feature	Description
1	Cover	Removable transparent plastic cover that opens to provide access for cleaning the printer components and changing the media.
2	cab SQUIX printer touchscreen	Displays the Ready message and various messages for service, and provides access to the Help menu that contains how-to videos for maintaining the printer. For details, see "Using the cab SQUIX printer touchscreen" on page 133 .
3	cab A2+ printer service display	Displays the Ready message and various messages for service. For details, see "Using the cab A2+ printer display and navigator pad" on page 135 .
4	cab A2+ service navigator pad	Used by the factory and field service personnel to set up the printer or change settings on the printer.

Printer side view

Figure Printer side view with cover removed



Item	Feature	Description
1	Ribbon supply hub	Holds the unused printer ribbon roll. The printer requires the Microplate Labeler Media Kit (not shown), which contains the thermal transfer ribbon and labels for the printer.
2	Ribbon take-up hub	Rewinds the used ribbon.
3	Printhead (hidden under the ribbon)	The narrow bar that presses the image through the ribbon and onto the label as the media move into position on to the print roller.
4	Print roller and rewind assist roller	The rollers that assist in moving the label strip under the printhead (print roller) and to the internal rewinder.
5	Internal rewinder	Rewinds and holds the used label strip.
6	Roll retainer	Holds the unused label roll.
7	Margin stop	Locks the roll retainer and holds the ribbon roll securely in place.

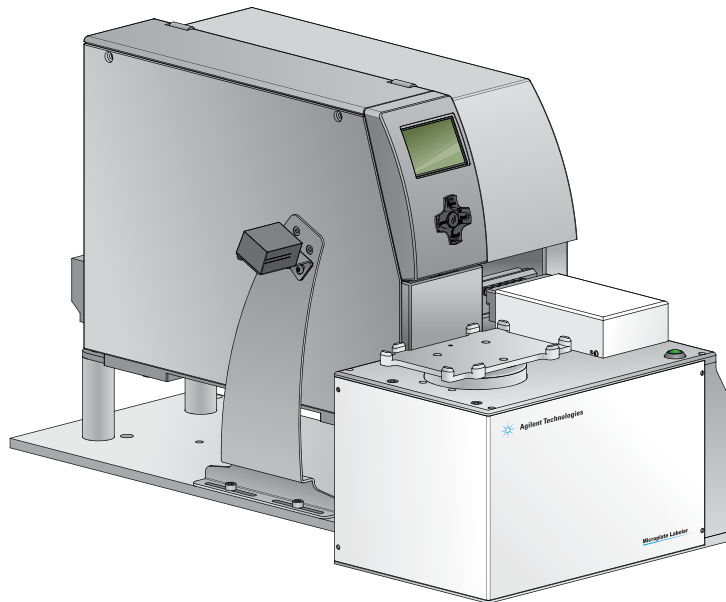
Barcode reader

The optional barcode reader is connected to the Microplate Labeler so that it can be used with the software to verify or clone barcodes.

IMPORTANT

Successful integration of a barcode reader requires that the barcode reader have the correct pinouts, power, and is able to communicate the correct commands to the Microplate Labeler.

Figure Microplate Labeler with barcode reader installed



Related information

For information about...

Barcodes

The labeling process

How to install and use the barcode reader

See...

- ["Introduction to microplate labels and barcodes" on page 25](#)
- ["Barcodes and supported symbologies" on page 97](#)

["How the device applies a label" on page 27](#)

Agilent Automation Solutions Technical Support

Overview of the controlling software

About this topic

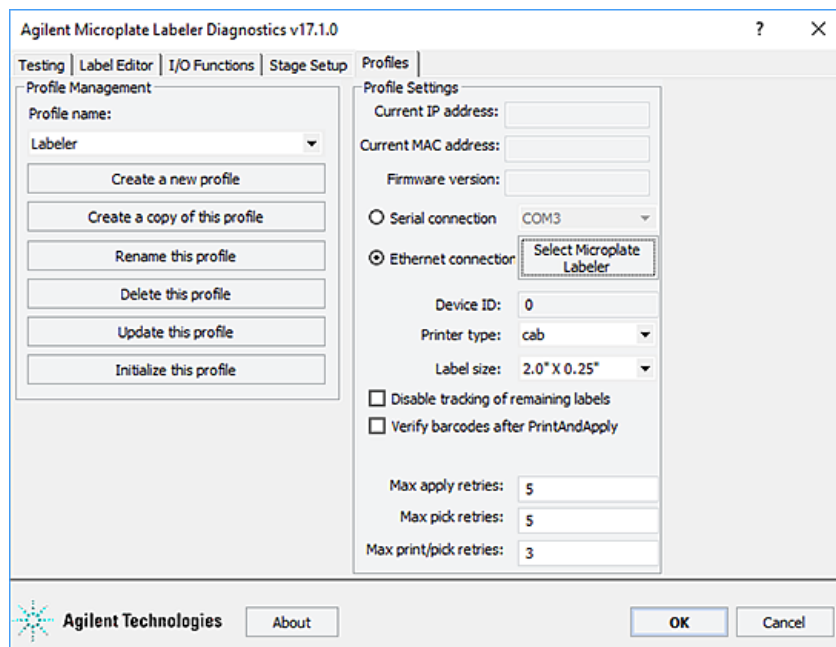
This topic describes the software components you use to operate the Microplate Labeler:

Microplate Labeler Diagnostics overview

Microplate Labeler Diagnostics is a component of the provided software. You can access Microplate Labeler Diagnostics through the VWorks software or the ActiveX controls.

You use Microplate Labeler Diagnostics to set up and troubleshoot the device, including:

- *Create and manage profiles.* A profile allows you to set up communication between the Microplate Labeler and the controlling computer.
- *Create and edit label formats.* You can use the provided templates and customize them to create your own label formats.
- *Perform test print-and-apply operations.* You can print test labels when verifying a label format design, setting up the device, or troubleshooting problems.
- *Set up the plate stage positions.* If required, you can adjust the plate stage positions, for example the robot pickup angle for a device that is integrated in an automation control system.
- *Check the basic device functions.* You can actuate the pneumatic controls to verify the device functioning and to check the alignment of the plate stage and applicator head.



Access to Microplate Labeler Diagnostics depends on the automation control software you are using.

Automation control software

You can use either the VWorks software or third-party automation software to operate the Microplate Labeler in protocol runs. If you plan to use third-party automation software, you will need to use the Microplate Labeler ActiveX control to permit the software to interface with the device.

VWorks software

The VWorks software enables you to:

- *Set up the devices.* During setup, you create device files for your specific set of devices. You can also create user accounts with different levels of privileges to enforce access policies.
- *Define labware.* Labware definitions describe the type and the geometry of the labware that the devices will be handling during the protocol runs. For the Microplate Labeler, the labware definition includes the plate stage height. For instructions, see the [VWorks Automation Control Setup Guide](#).
- *Create protocols.* Protocols determine the sequence of tasks that you want to automate in a run. For example, you can use a protocol to apply barcode labels to 100 microplates automatically.
- *Run, pause, monitor, and stop protocols.* You can start, pause, monitor, and stop a protocol run from the controlling computer.

For more details, see the [VWorks Automation Control User Guide](#).

ActiveX control

Instead of using the VWorks software, you can use another automation control software to operate the Microplate Labeler in protocol runs. The Microplate Labeler ActiveX control allows the automation software to interface with the device. For more information, see the [Microplate Labeler ActiveX User Guide](#).

For information about...	See...
Starting Microplate Labeler Diagnostics	<ul style="list-style-type: none"> • "Opening Diagnostics" on page 62 • "Quick reference to Diagnostics software" on page 139
VWorks software	<ul style="list-style-type: none"> • "Creating a VWorks device file" on page 58 • VWorks Automation Control User Guide
ActiveX controls	Microplate Labeler ActiveX User Guide

Microplate labeling tips

The labeling quality depends on the following factors.

Factor	Description	See ...
Labware selection	Microplate material and design contribute to how well a label adheres to the side of a microplate.	"Labware considerations" on page 22
Label placement	The position of the label on the microplate can affect label adhesion and whether a barcode reader can scan the barcode.	"Labware considerations" on page 22
Media selection	The quality of the adhesive labels determines how well the Microplate Labeler can pick-and-apply a label. The ribbon and label also play a big role in how successful readers will be in decoding the symbology and the ability of the label to withstand exposure to chemicals and temperature and humidity extremes.	Agilent Media Kit
Label format design	The label design must meet certain criteria to ensure the readability by barcode readers and humans.	"About label formats and content" on page 80

Labware considerations

About this topic

This topic provides guidelines for selecting automation-ready labware for use with the Microplate Labeler.

Acceptable microplates

The Microplate Labeler accommodates a wide range of microplates that meet American National Standards Institute (ANSI) Standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004.

Note: You can contact the labware manufacturer to inquire about ANSI-compliant labware.

For use of nonconforming labware, contact Agilent Automation Solutions Technical Support.

Figure Microplate (side view) with barcode label

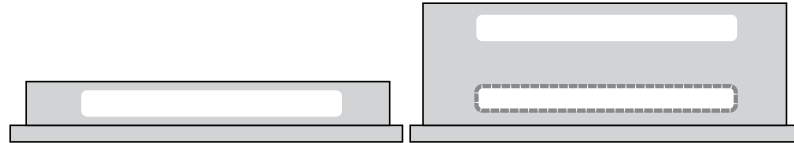


About label placement

The Microplate Labeler is designed to place the labels as follows:

- Centered horizontally (left to right) on of any of the four sides of a microplate.
- At either of two vertical positions on the microplate. This feature accommodates the labware of varying sizes or that have different skirt heights.

Figure Examples of label positions on different sizes of labware



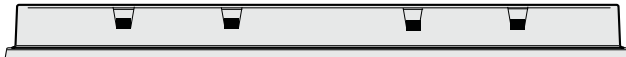


On microplates with tall skirts, labels may be placed on the skirt, but should be evaluated for compatibility with the application. See the following guidelines.

Labware selection guidelines

To attach a label to a microplate successfully, the Microplate Labeler requires a flat, even surface that is slightly larger than the label. Applying labels to an uneven surface, for example overlapping the edge of a microplate skirt, results in problems with label adhesion.

The following table provides guidelines. Evaluate the make and model of all your microplates to ensure consistent results for all application conditions.

Criteria	Guidelines
Microplate design	<p>Avoid microplates with the following features that can interfere with label placement and adhesion:</p> <ul style="list-style-type: none"> • Microplates with tall, raised skirts  • Microplates with raised surfaces on the sides  • Low-profile microplates with no skirt or half-skirted microplates, such as PCR plates, where the available height for label placement is very near or less than the height of the label <p>Such microplates may also be incompatible with the Microplate Labeler plate stage.</p> • Microplates with holes in the sides, which can reduce adhesion of the label <p>Holes can also be challenging for robotic grippers.</p> 

2 Introduction to the Microplate Labeler

Labware considerations

Criteria	Guidelines
Microplate material	<p>The Microplate Labeler is designed for compatibility with labware that features plasticized surfaces, such as polypropylene or polystyrene. For the best results, apply the adhesive labels to labware that is:</p> <ul style="list-style-type: none">• Dry and at room temperature• Clean and has not been subjected to liquids or powders that can reduce or prevent adhesion of the labels• Not warped <p>Warped microplates can hamper the device's ability to repeatably place labels at the same position on all microplates within a run.</p>

Related topics

For information about...	See...
Label formats and content	"About label formats and content" on page 80
Plate stage and applicator head positions	"About plate stage and applicator head positions" on page 69
Setting the height of the plate stage position	"Setting the plate stage vertical positions" on page 72

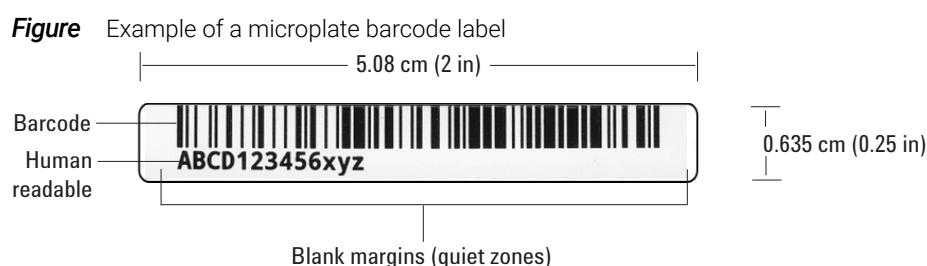
Introduction to microplate labels and barcodes

About this topic

This topic provides an overview of the labels that you can create for the Microplate Labeler and a general description of barcode types.

Microplate labels

The labels that you create for the Microplate Labeler can contain up to six fields of data, including one barcode field and five human-readable text fields. The following figure shows an example of a typical label that contains two fields: one barcode field and one human-readable field.



In the example, the barcode field has a blank margin (quiet zone) on each end to ensure that a barcode reader can read the barcode successfully. For more details on label design, see [“About label formats and content” on page 80](#).

About barcodes

Barcodes contain information that can be read automatically, facilitating the fast and accurate tracking of microplates in lab automation systems. A barcode reader scans the line patterns, and software converts the encoded patterns into usable information. The method used for creating a barcode from text is called its *symbolology*. Your choice of symbolology depends on the barcode reader used for your application and your laboratory preferences.

The Microplate Labeler can print either linear or two-dimensional (2D) barcodes.

Linear barcodes

A linear barcode is a sequence of parallel bars and spaces of variable widths that are arranged in groups. Each group represents an individual number, letter, or symbol. Within each group, the information is encoded by the relative thicknesses and relative positions of the bars and spaces. A linear barcode symbol contains a leading blank margin (quiet zone), a start character, one or more data characters, a stop character, and a trailing quiet zone.

Figure Example of a linear barcode using Code 128 symbolology



Two-dimensional barcodes

2D barcodes are comprised of dots or small bars arranged as a matrix or in a stacked arrangement. The 2D barcodes typically can contain more information than linear barcodes because they encode data in both the vertical and horizontal directions.

Figure Example of a 2D barcode using Data Matrix symbology



Related topics

For information about...	See...
Label formats and content	"About label formats and content" on page 80
Barcodes symbologies	"Barcodes and supported symbologies" on page 97

How the device applies a label

About this topic

This topic describes what happens when you run a Microplate Labeler print-and-apply task.

Process

The following sequence of events occurs when you start a print-and-apply task:

- 1 The Microplate Labeler prints the label and moves the printed label forward to the peelbar on the printer. As the label strip reaches the peelbar, the printed label lifts off the backing.
- 2 The applicator head extends towards the printer until the vacuum pads touch the printed label.
- 3 A vacuum is created in the applicator head's vacuum pads to grip the label.
- 4 After the vacuum is sensed, the applicator head retracts with the label held by the vacuum pads.
- 5 The plate stage rotates so that the selected side of the microplate is facing the applicator head.
- 6 The applicator head rotates until it is perpendicular to the microplate on the plate stage, and then extends, pushing the label onto the microplate.
- 7 Air is pushed through the vacuum pads, breaking the vacuum seal.
- 8 The applicator head retracts and returns to face the printer.
- 9 The plate stage moves to the next selected position.

Related topics

For information about...

Locations of hardware components

Workflows for operating the
Microplate Labeler

See...

["Hardware overview" on page 12](#)

["Overall setup workflow" on page 28](#)

Overall setup workflow

About this topic

This topic describes the workflow for setting up and operating an integrated device using the VWorks software.

Note: The steps for installing and operating the Microplate Labeler in a third-party lab automation system might differ. For details, see the [Microplate Labeler ActiveX User Guide](#) and the third-party user documentation provided with that system.

Workflow for the VWorks software

Step	Procedure	For more details, see...
1	Install the Microplate Labeler.	"Installation workflow" on page 30
2	Install the VWorks software, or integrate the Microplate Labeler ActiveX control.	Software release notes
3	Start the VWorks software and log in.	VWorks Automation Control Setup Guide
4	Set up the Microplate Labeler.	"Setup workflow" on page 56
5	Determine which label format you want to use. The software includes a variety of templates that you can use or customize for your application.	"Creating and editing label formats" on page 84
6	Specify the plate stage height for your labware in the labware definitions using the Labware Editor.	VWorks Automation Control Setup Guide
7	Perform a test print-and-apply test from Microplate Labeler Diagnostics to check the label format and label position on the microplate.	"Performing a print-and-apply test" on page 106
8	Create the protocols to run the labeling task. You set the labeling task parameters, including the label content, and select the label format for each labeling task.	VWorks Automation Control User Guide , Print and Apply task
9	Start the protocol.	VWorks Automation Control User Guide

3 Installing the device

This chapter describes how to unpack and install the Microplate Labeler.

The topics are:

- ["Installation workflow" on page 30](#)
- ["Laboratory requirements" on page 31](#)
- ["Connecting the air tubing: non-metric" on page 34](#)
- ["Connecting the air tubing: metric" on page 36](#)
- ["Setting the air pressure" on page 38](#)
- ["Connecting the power cord" on page 39](#)
- ["Connecting the device to the computer" on page 41](#)
- ["Loading labels and ribbon" on page 44](#)

Installation workflow

About this topic

This topic provides the workflow for installing a Microplate Labeler. Typically, Agilent Technologies completes this initial installation for you.

Workflow

Step	For this task...	See...
1	Ensure that your laboratory meets the site requirements.	"Laboratory requirements" on page 31
2	Unpack the Microplate Labeler.	<i>Microplate Labeler Unpacking and Packing Guide</i>
3	Connect the air tubing.	<ul style="list-style-type: none">"Connecting the air tubing: non-metric" on page 34"Connecting the air tubing: metric" on page 36
4	Connect the Microplate Labeler to the power source.	"Connecting the power cord" on page 39
5	Connect the Microplate Labeler to the computer using either an Ethernet or serial connection.	"Connecting the device to the computer" on page 41
6	Install the automation control software, for example, the VWorks software.	Software release notes
7	Install the labels and ribbon in the printer.	"Loading labels and ribbon" on page 44
8	<i>Optional.</i> Install the barcode reader.	Agilent Automation Solutions Technical Support

Related topics

For information about...	See...
Safety	"Safety guidelines" on page 1
How to report a problem	"Reporting problems" on page 137

Laboratory requirements

About this topic

This topic describes the requirements for the site where you plan to install the Microplate Labeler. The topics are:

- [“Laboratory space requirements” on page 31](#)
- [“Electrical requirements” on page 32](#)
- [“Compressed air requirements” on page 32](#)
- [“Environmental requirements” on page 33](#)
- [“Computer requirements” on page 33](#)
- [“Consumables” on page 34](#)

Laboratory space requirements

General bench requirements

Make sure the bench for the Microplate Labeler has the following:

- Sufficient space to accommodate the Microplate Labeler, computer, monitor, and accessories
 - Sufficient clearance:
 - On the back of the device to access power, communication, and air tubing connections
 - Above the printer to open the printer cover
 - On the side of the printer to replace the label and ribbon rolls
- Note:* The snap-off cover can be removed from the printer if the device is operated within an enclosure where no corrosive chemicals or gases are present.
- A fixed bench (without wheels) that can support the weight of the Microplate Labeler without excessive shaking or movement
 - Proper height for any operator to comfortably operate the Microplate Labeler

Physical specifications

Dimension	Value
Width	28.7 cm (11.3 in)
Height	35.1 cm (13.8 in)
Height with printer cover opened	48.8 cm (19.2 in)
Depth	62.2 cm (24.5 in)
Weight	21 kg (47 lbs)

Note: Measurements do not include the cables or the computer.

Figure Dimensions (front and side views)

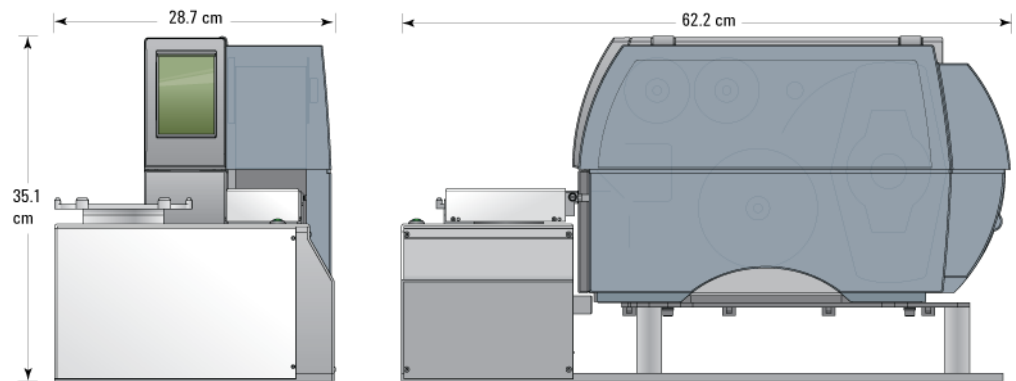
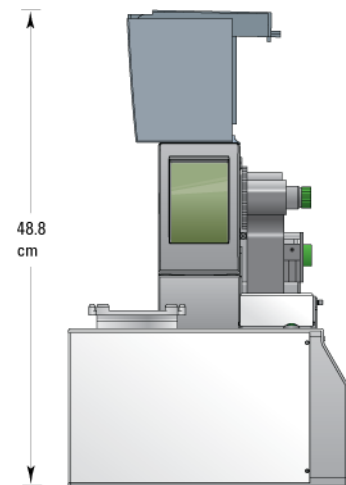


Figure Microplate Labeler with printer cover open (front view)



Electrical requirements

The Microplate Labeler device has the following power requirements:

Utility	Requirement
Electrical	100–240~, 50/60 Hz, 2.75 A
Fuse	Two 3 A, 0.25 x 1.25 in (6.35 x 31.75 mm), fast acting

Compressed air requirements

The Microplate Labeler requires the use of clean, dry, compressed air to move the pneumatic components. The compressed air can be from the following sources:

- Centralized source (laboratory)
- Compressed-air cylinders
- Portable pumps

CAUTION

Ensure that the air coming into the Microplate Labeler is properly filtered from moisture or aerosolized impurities. Significant moisture or impurities in the air line can adversely affect the performance and life of the Microplate Labeler. Using oil compressors can cause oil to leak into the Microplate Labeler and void your warranty.

The Microplate Labeler has the following minimum compressed-air requirements:

Requirement	Value
Quality	Clean, dry, compressed
Flow rate and pressure	1.2 Lps at 0.55 MPa (2.5 cfm at 80 psi)

Environmental requirements

The Microplate Labeler is for indoor use only. The following table lists the operating specifications for the device.

Operating	Specification
Pollution degree	2
Installation category	II
Temperature	4–40 °C
Humidity	10–90% RH, non-condensing
Altitude	1–2000 m

Make sure the Microplate Labeler is located away from moisture (sprays of water or mists).

The Microplate Labeler uses adhesive labels that are compatible with most common laboratory solvents, including DMSO and alcohols. The labels can withstand exposure to temperatures of –80 °C to 100 °C.

Computer requirements

The requirements of the controlling computer depend on the lab automation software you are using.

- *VWorks software computer requirements.* See the VWorks software release notes or the Automation Solutions Knowledge Base at www.agilent.com/chem/askb.
- *Third-party automation software requirements.* See the user documentation supplied with the product.

Consumables

The Microplate Labeler uses thermal transfer ribbon and adhesive labels. Your shipment includes the Agilent Media Kit, which contains a one-to-one quantity of the ribbon and labels so that you can replace them at the same time. The kit also contains a pen for cleaning the printhead and an empty spool to take up the used ribbon.

Related topics

For information about...	See...
How to install the device	"Installation workflow" on page 30
How to install the software	Software release notes
Safety	"Safety guidelines" on page 1
How to report a problem	"Reporting problems" on page 137

Connecting the air tubing: non-metric

About this topic

For non-metric-based installations, such as those in the U.S., this topic explains how to connect the air tubing to the Microplate Labeler.

Before you begin

WARNING

To avoid injury, turn off the air supply before installing your Microplate Labeler. When air is flowing, air tubing can injure you if it whips around and strikes you. If you have not been trained in the correct way to handle air tubing, contact your facilities department.

CAUTION

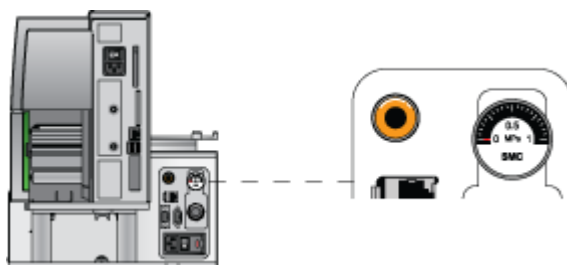
Make sure that the air tubing coming into your Microplate Labeler is properly filtered for moisture. Moist air might shorten the life of your device. If the quality of your air supply is in question, contact Agilent Automation Solutions Technical Support.

Locate the air connection kit (non-metric), including tubing and fittings, provided with your device.

Connection procedure

To set up a direct connection, use the following procedure. If you have another device connected to the air supply, use the supplied quick-release T-connector to connect to the existing air tubing.

Figure Connection panel: orange air-supply port (left) and pressure gauge (right)



To install the air tubing:

- 1 Cut the supplied 1/4-inch tubing to the required length.
- 2 If your air supply uses a threaded connection at the supply end, attach the 1/4-inch NPT fitting to the connection.
- 3 Plug one end of the tubing into your lab's air supply.
- 4 Connect the tubing from the air source to the long end of the toggle switch assembly. Connect the short end of the toggle switch assembly to the tubing that connects to the Microplate Labeler.
- 5 Push the other end of the 1/4-inch tubing into the orange quick-release air-supply port at the back of the Microplate Labeler.
- 6 Test the installation by gently tugging the air tubing.
If you feel resistance, the line has been installed properly.

Related topics

For information about...	See...
How to install the device	"Installation workflow" on page 30
Site requirements for installation	"Laboratory requirements" on page 31
How to connect air tubing for metric-based installations	"Connecting the air tubing: metric" on page 36
Setting the air pressure	"Setting the air pressure" on page 38
Disconnecting air supply	"Disconnecting the air tubing" on page 123

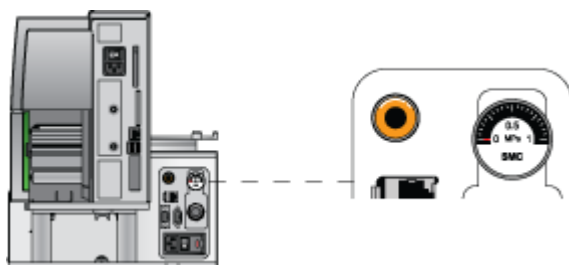
Connecting the air tubing: metric

About this topic

This topic explains how to connect the air tubing to the Microplate Labeler for metric-based installations.

To make the Microplate Labeler compatible with your lab's air system, you connect the supplied 6-mm air tubing to the Microplate Labeler air supply port. This topic describes how to make this connection.

Figure Connection panel: orange air-supply port (left) and pressure gauge (right)



Before you start

WARNING

Turn off the air supply at the source before installing the Microplate Labeler. If you have not been trained in the correct way to handle air tubing, contact your facilities department or Agilent Automation Solutions Technical Support for assistance.

CAUTION

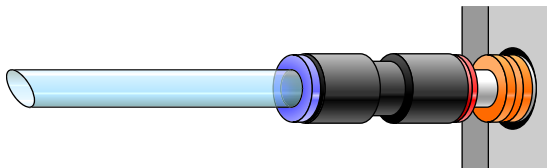
Make sure that the air coming into the Microplate Labeler is dry and free of impurities, such as oil, which can damage the Microplate Labeler. If you have any questions about air quality, contact Agilent Automation Solutions Technical Support.

Locate the air connection kit (metric), including tubing and fittings, provided with your device.

Connection assembly

The metric fittings kit contains an adapter.

Figure Connection to Microplate Labeler using adapter



Procedure

The following procedure is used to set up a direct connection. If you have another instrument connected to the house air supply, you can use the supplied T-connector to connect into the existing air tubing.

To connect the metric fittings adapter:

- 1 Push one end of the nipple (white plastic tube) into the 1/4-inch side (red side) of the adapter.
- 2 Push the other end of the nipple into the air input port on the Microplate Labeler.
- 3 Push the 6-mm tubing into the blue side of the adapter.

CAUTION

Attempting to use tubing that has a different diameter can damage the adapter.

- 4 Gently pull on the air tubing to ensure that the assembly is connected properly.

Related topics

For information about...	See...
How to install the device	"Installation workflow" on page 30
Site requirements for installation	"Laboratory requirements" on page 31
How to connect air tubing for North America	"Connecting the air tubing: non-metric" on page 34
Setting the air pressure	"Setting the air pressure" on page 38
Disconnecting air supply	"Disconnecting the air tubing" on page 123
Safety	"Safety guidelines" on page 1
How to report a problem	"Reporting problems" on page 137

Setting the air pressure

About this topic

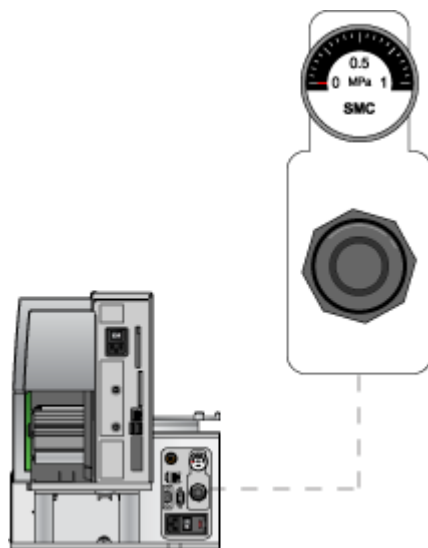
This topic describes how to set the air pressure after connecting the air tubing to the Microplate Labeler.

Procedure

To set the air pressure:

- 1 Turn on the air supply to the Microplate Labeler.
Depending on your lab configuration, the mechanism for turning on the air supply might be a pressure regulator located on the wall or on a compressed air cylinder, or a toggle switch on the air line. The air supply to the Microplate Labeler should be in the range of 0.55 MPa (80 psi) to 0.58 MPa (85 psi).
- 2 To adjust the internal air-pressure regulator on the Microplate Labeler:
 - a On the back of the applicator, pull out the pressure regulator knob until you feel a click.
 - b While watching the pressure gauge, turn the knob to increase or decrease the pressure so that the gauge reads in the following range:
0.55 MPa (80 psi) to 0.58 MPa (85 psi)
 - c Push the knob back in.

Figure Connection panel: air pressure gauge (top) and pressure regulator knob (bottom)



IMPORTANT

Check the air pressure after using the Microplate Labeler for the first time to make sure the air pressure setting is correct.

Related topics

For information about...	See...
How to install the device	"Installation workflow" on page 30
Site requirements for installation	"Laboratory requirements" on page 31
Connecting the air tubing	"Connecting the air tubing: non-metric" on page 34 "Connecting the air tubing: metric" on page 36
Disconnecting air supply	"Disconnecting the air tubing" on page 123
Safety	"Safety guidelines" on page 1
How to report a problem	"Reporting problems" on page 137

Connecting the power cord

About this topic

This topic explains how to connect the Microplate Labeler to a power source.

Before you start

WARNING

The Microplate Labeler has moving parts. Keep clothing, hair and jewelry away from it at all times.

Procedure

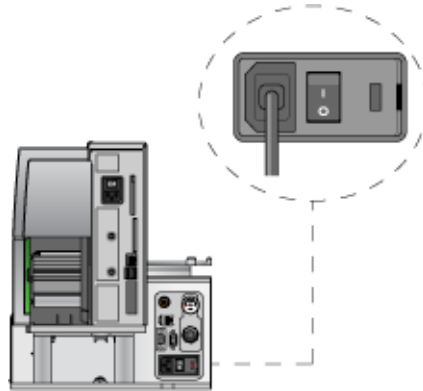
To install the power cord:

- 1 On the back of the Microplate Labeler applicator, ensure that the power switch is set to **off** (o).

3 Installing the device

Connecting the power cord

Figure Connection panel: AC power port and power switch



- 2 Plug one end of the power cord into the AC power port on the connection panel.
- 3 Plug the other end of the power cord into an appropriate, grounded electrical socket.

Later, after you connect the computer, you will start up the device.

Related topics

For information about...	See...
Connecting the computer	"Connecting the device to the computer" on page 41
Turning on the device	"Starting up and shutting down" on page 54
How to install the device	"Installation workflow" on page 30
Site requirements for installation	"Laboratory requirements" on page 31
Connection panel	"Connection panel (back view)" on page 14
Safety	"Safety guidelines" on page 1
How to report a problem	"Reporting problems" on page 137

Connecting the device to the computer

About this topic

This topic describes how to connect the computer to the Microplate Labeler using either of the following:

- Ethernet connection (recommended)
- Serial connection

Using an Ethernet connection

You can use Ethernet to connect a Microplate Labeler to the computer using one of the following connections:

- *Direct connection.* A communication cable connects a single Microplate Labeler directly to a single host computer, where no other robots or devices must interact or communicate.
- *Ethernet switch.* An Ethernet switch connects the single cable from the computer to one or more cables that lead to one or more devices. If you are setting up a local area network (LAN) that has other devices on it, use an Ethernet switch.

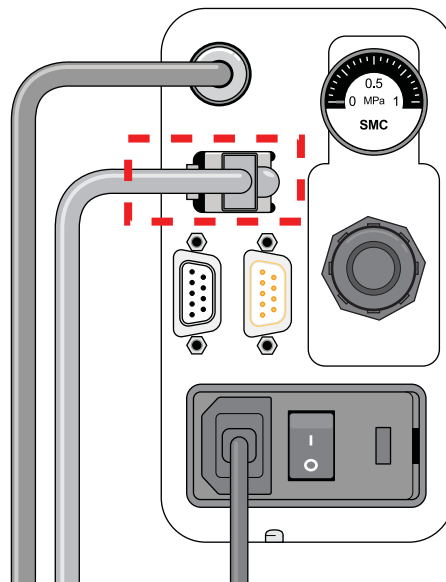
The Agilent configured computer has two Ethernet ports:

- *Port for the add-on Ethernet card.* Configured for a static address. You connect the Microplate Labeler to the port configured for a static address.
- *Port for the computer's built-in Ethernet card.* Configured for a dynamic address. You can use this port to connect to your company network.

To connect directly to the computer using Ethernet:

Connect one end of the Ethernet cable to the Ethernet port on the Microplate Labeler connection panel, and connect the other end of the cable to the Ethernet port of the computer.

Figure Connection panel: Ethernet connection



3 Installing the device

Connecting the device to the computer

To connect through an Ethernet switch:

- 1 Connect the switch to the computer as follows:

Note: If you are adding the Microplate Labeler to an existing LAN, this step should already be done.

- a Connect the power cord to the switch.
- b Connect one end of the Ethernet cable (black) into any Ethernet port on the switch, and connect the other end of the cable to an Ethernet port on the computer.

- 2 Connect the Microplate Labeler to the switch as follows:

- a Connect one end of a second Ethernet cable to a port on the Ethernet switch.
- b Connect the other end of the cable to the Ethernet port on the Microplate Labeler.

Connecting additional devices

You can connect additional Microplate Labelers to the network through the switch. Each Microplate Labeler requires an additional profile.

IMPORTANT

Before connecting multiple Microplate Labeler devices on the same network, contact Agilent Automation Solutions Technical Support for guidance on setting the IP addresses.

About configuring the computer's network card (Ethernet only)

The Agilent configured computer is already set up to communicate with the Microplate Labeler. No change to the network card IP address is required.

If you are using a computer other than an Agilent configured computer, make sure the value of the network card IP address and subnet mask are as follows:

- IP address: 192.168.0.1
- Subnet mask: 255.255.255.0

If your computer will be connected to your LAN, make sure the computer has a second network card. The second network card can have a dynamic IP address.

Using a serial connection

If you are connecting a single Microplate Labeler to a computer, you can use a serial connection.

CAUTION

Using serial connections to connect more than one Microplate Labeler to the same computer can cause problems with the barcode label formats.

To use a serial connection:

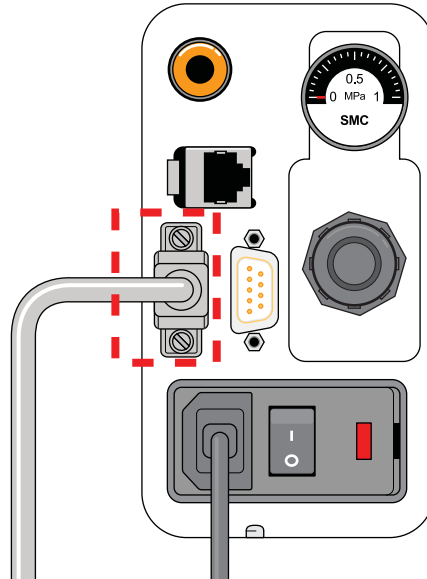
- 1 Connect one end of the supplied RS-232 DB-9 serial cable (beige) to a COM port on the computer.

IMPORTANT

The serial cable is a straight-through, pin-to-pin cable. Make sure you are not using a serial null-modem cable, which may look identical but will prevent proper communication with the Microplate Labeler.

- 2 Connect the other end of the cable to the serial port on the Microplate Labeler connection panel.

Figure Connection panel: serial connection



To install the automation control software, see the software release notes, for example, the VWorks Automation Control Software Release Notes.

Related topics

For information about...	See...
Changing the IP settings on a computer and on the Microplate Labeler	Agilent Automation Solutions Technical Support
How to install the device	"Installation workflow" on page 30
Site requirements for installation	"Laboratory requirements" on page 31
Connection panel	"Connection panel (back view)" on page 14
Safety	"Safety guidelines" on page 1
How to report a problem	"Reporting problems" on page 137

Loading labels and ribbon

About this topic

This topic describes how to load labels and ribbon in the Microplate Labeler printer.

After you load the labels and ribbon, perform several print-and-apply tests to ensure that the labels are printing correctly and that the vacuum pads on the applicator head can pick the labels off of the label backing.

Note: If the Microplate Labeler is fitted with a cab SQUIX printer, you can go to the printer touchscreen Help menu to view videos showing how to load labels and ribbon.

Before you begin

Ensure that you have the Microplate Labeler Media Kit from Agilent Technologies. The kit contains a one-to-one quantity of ribbon and labels so that you can replace them at the same time. The kit contents are:

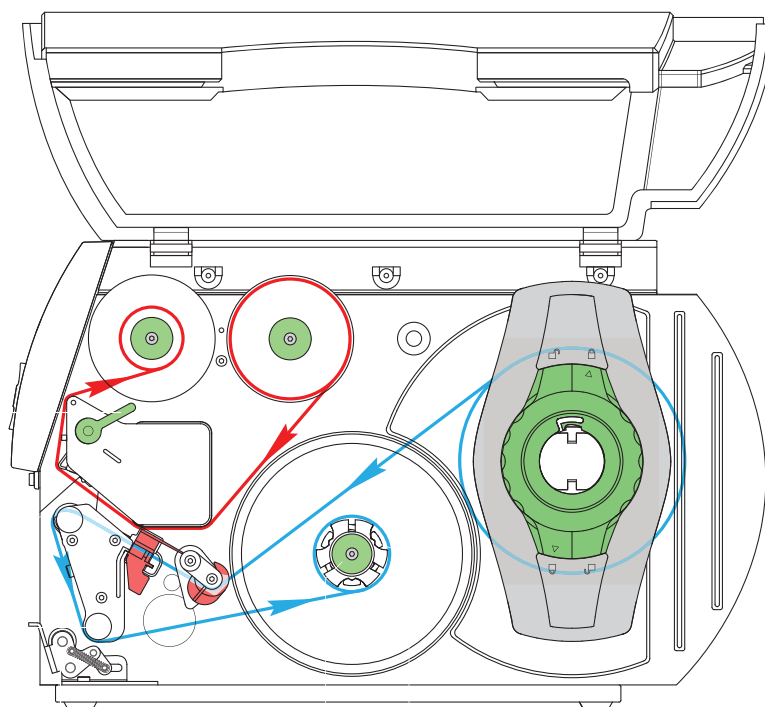
- Roll of labels (6,500)
- Thermal transfer ribbon
- Empty ribbon core (functions as a spool to rewind the used ribbon)
- Cleaning pen

WARNING

The printhead can be hot after use. Allow the printhead to cool before changing the ribbon.

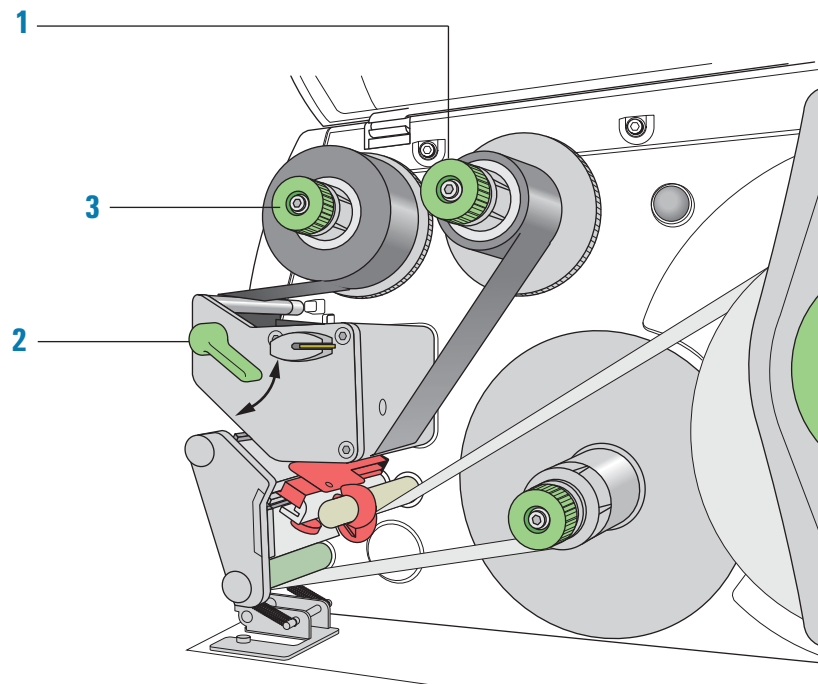
Open the printer cover to gain access for loading the labels and ribbon.

Figure Printer (side view) showing the feed paths of the ribbon (red) and labels (blue)





Removing the used ribbon

See the following figure for the component locations referenced in the procedure.



To remove the used ribbon:

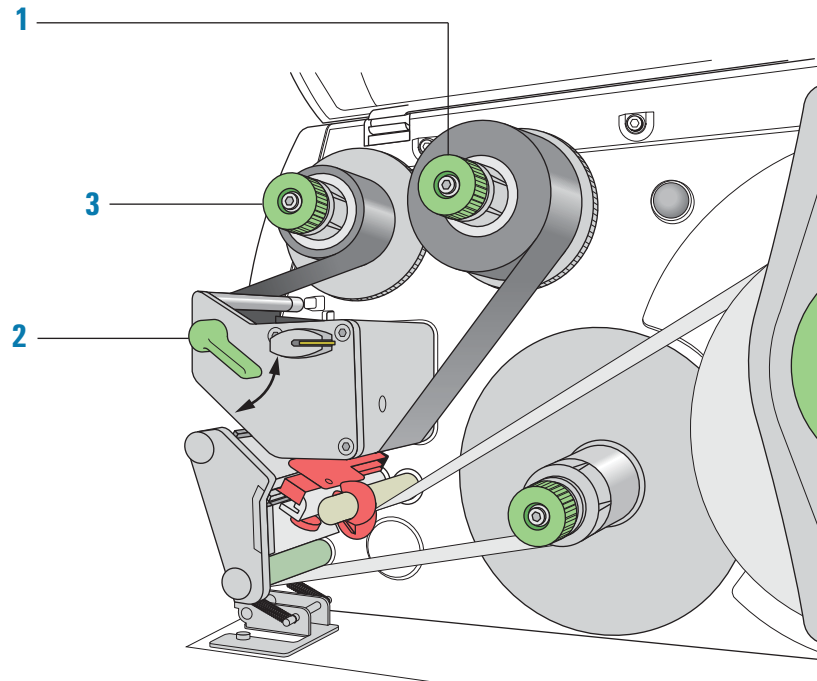
- 1 While firmly grasping the ribbon supply hub (1), turn the green knob clockwise  to contract the hub and loosen the empty roll. Slide the roll off of the hub.
- 2 Lift the printhead lever (2) counterclockwise to lift the printhead.
- 3 While firmly grasping the take-up hub (3), turn the green take-up knob clockwise  to contract the hub and loosen the used roll of ribbon. Slide the used roll off of the take-up hub.
- 4 Lift the remaining ribbon out of the printer.

IMPORTANT



Clean the printhead before loading the new ribbon. See ["Cleaning the printer components" on page 115](#).

Loading the new ribbon

See the following figure for the component locations referenced in the procedure.



To load new ribbon:


- 1 Install the new ribbon roll on the supply hub (1) as follows:
 - a While firmly holding the supply hub, turn the green knob clockwise  to contract the hub. Slide the new ribbon roll onto the hub until it is flush against the printer. Ensure the ribbon feeds clockwise with the coating facing downward when being unwound.
 - b While firmly holding the hub, turn the green knob counterclockwise  to expand the hub and secure the ribbon roll.
- 2 Ensure the printhead lever (2) is up to lift the printhead, and then guide the ribbon under and around the printhead.


WARNING

The printhead can be hot after use. Allow the printhead to cool before changing the ribbon. The printhead is the narrow bar that presses the image through the ribbon and onto the label as the media move onto the print roller.

CAUTION

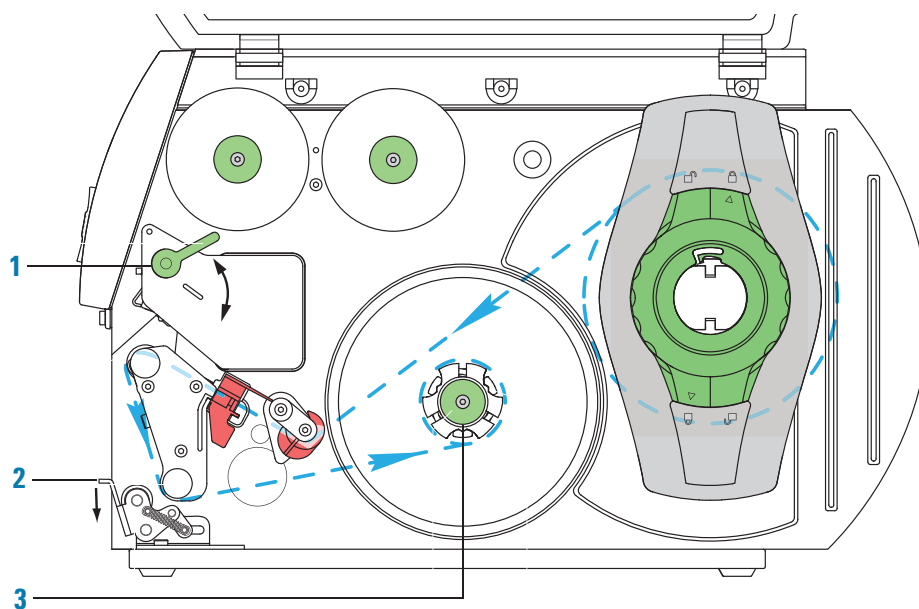
Do not touch the protective glass layer of the printhead with your fingers. A dirty printhead will result in a poor print image.

- 3 Feed the ribbon onto an empty core on the take-up hub (3) as follows:
 - a While firmly holding the take-up hub, turn the green knob clockwise  to contract the hub. Slide an empty ribbon core onto the hub until it is flush against the printer.


- b** While firmly holding the hub, turn the green knob counterclockwise  to expand the hub and secure the ribbon core.
 - c** Guide the ribbon under and then over the take-up hub so that it winds counterclockwise. Use adhesive tape to secure the end of the ribbon to the ribbon core. Make sure the edge of the ribbon is flush with the core against the printer.
- 4** Turn the ribbon take-up hub **(3)** counterclockwise to smooth out the ribbon slack. If you are also loading labels, continue to the next procedure. If you are finished loading all media, turn the printhead lever **(2)** clockwise to lower the printhead.

Removing a used label roll

See the following figure for the component locations referenced in the procedure.



To remove a used label roll:

- 1** If the printhead is not already in the up position, lift the printhead lever **(1)** counterclockwise to lift the printhead.
- 2** Push down on the pinch-roller lever **(2)** to release the label strip.
- 3** Cut the used label strip, and wind it fully around the rewinder **(3)**.
- 4** While firmly holding the rewinder **(3)**, turn the green knob clockwise  to contract the rewinder and release the wound roll.
- 5** Remove the wound roll.

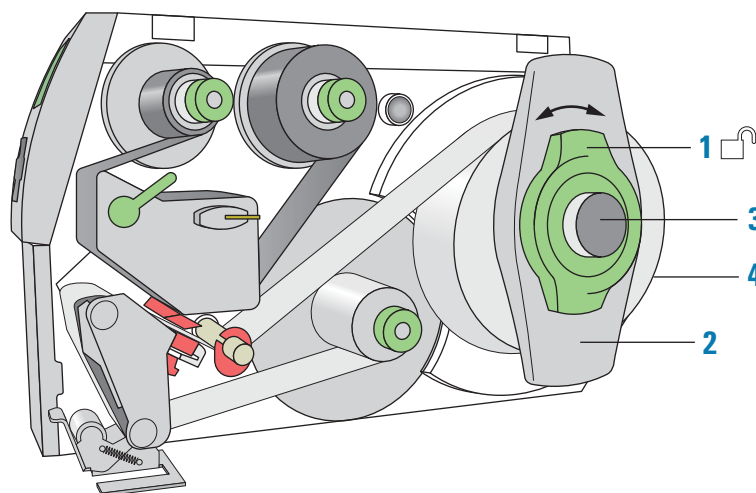
Note: You will remove the empty label core when you install the new label roll in the following procedure.

Loading the new labels



You install the labels in three basic steps:

Step	For this task...
1	Install the label roll on the roll retainer.
2	Feed the label strip under the printhead.
3	Secure the label strip to the rewinder.

Step 1. Installing the label roll on the roll retainer



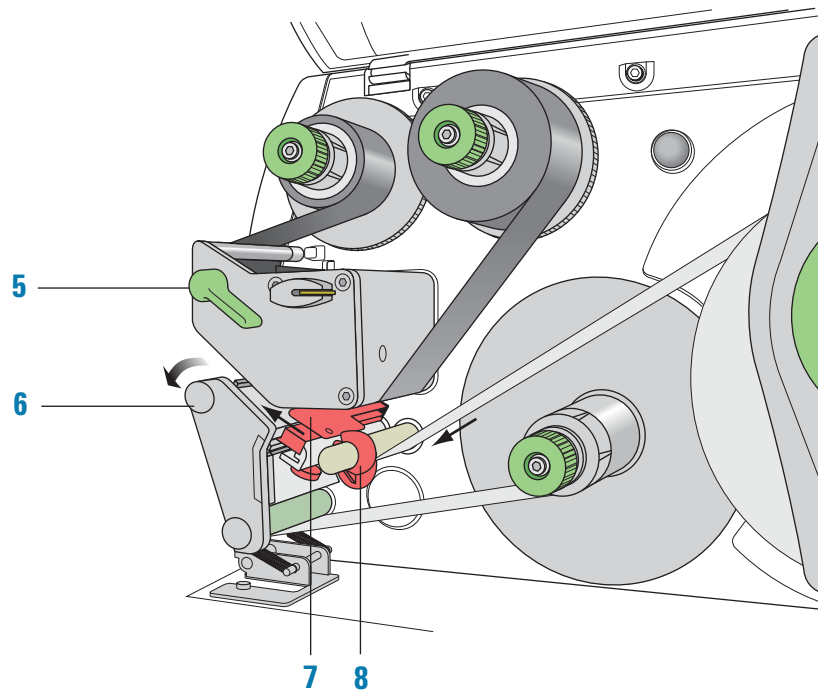
To install the label roll on the roll retainer:

- 1 Turn the green locking ring (1) counterclockwise, so that the arrow points to .
- 2 Remove the margin stop (2).
- 3 On the roll retainer (3), load the new label roll so that it feeds counterclockwise with the label side up.
- 4 Reposition the margin stop (2) on the roll retainer (3).
- 5 While firmly pushing the margin stop against the label roll (4), turn the green locking ring (1) clockwise, so that the arrow points to , securing the label roll in position.

IMPORTANT

To ensure the roll feeds properly and label presentation is repeatable, the margin stop must be firmly in place against the label roll.

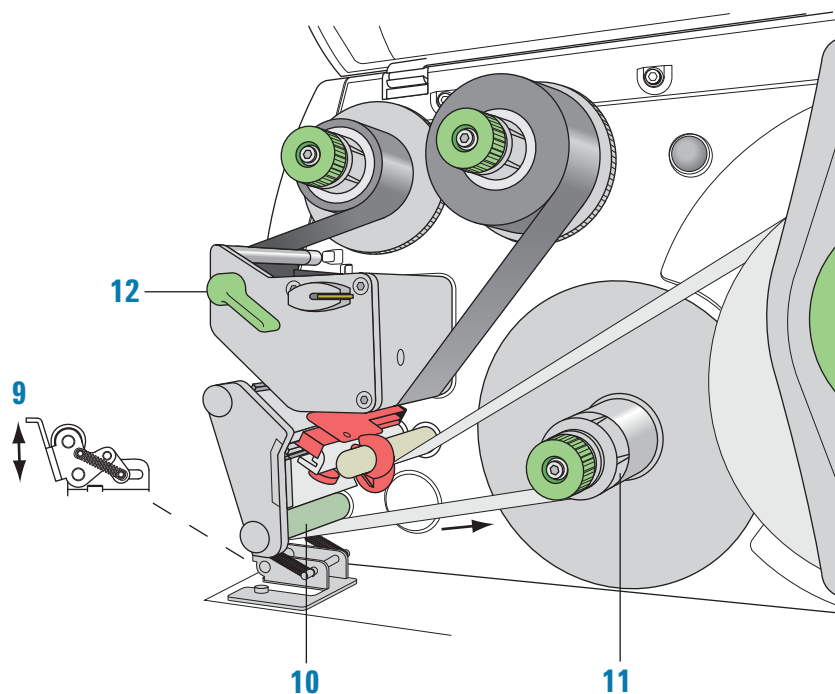
Step 2. Feeding the label strip under the printhead





To feed the label strip through the printhead:

- 1 Turn the printhead lever (5) counterclockwise to lift the printhead.
- 2 Slide the red guide ring (8) to the end of the axis bar.
- 3 Guide the label strip below the axis bar and through the label sensor (7) so that the label strip exits the print unit between the printhead and the print roller (6).
- 4 Push the guide ring (8) on the axis bar against the outer edge of the label strip.

Step 3. Securing the label strip to the rewinder



To secure the label strip to the rewinder:

- 1 Push down on the pinch-roller lever (9) to lift the pinch roller off the rewind assist roller.
- 2 Guide the label strip down and under the rewind assist roller (10) toward the rewriter (11).
- 3 While holding the rewriter (11) firmly, turn the green knob clockwise  until it stops.
- 4 Insert the label strip under the three brackets on the rewriter (11), and turn the green knob counterclockwise  until it stops. The rewriter is fully expanded, gripping the label strip firmly.
The inside edge of the label strip should be flush against the printer.
- 5 Turn the rewriter (11) counterclockwise to tighten the label strip.
- 6 Push up on the pinch-roller lever (9) to position the pinch roller into position on the rewind assist roller.
- 7 Turn the printhead lever (12) clockwise to lower the printhead into position.

After you finish loading new ribbon and labels

Use Microplate Labeler Diagnostics to run a print-and-apply test and verify that the labels print correctly and the applicator head can pick up the labels from the printer.

Optionally, you can reset the label counter in the I/O Functions tab to track the number of labels used.

Related topics

For information about...	See...
Performing a print-and-apply test	"Performing a print-and-apply test" on page 106
Resetting the label counter	"Resetting the label counter in the Diagnostics software" on page 117
Cleaning the printhead and print roller using the cleaning pen	"Cleaning the printer components" on page 115
Routine printer maintenance	"Routine maintenance" on page 102
Reporting problems	"Reporting problems" on page 137

4 Setting up the Microplate Labeler

This chapter describes how to perform the initial set up of the Microplate Labeler.

The topics are:

- [“Starting up and shutting down” on page 54](#)
- [“Setup workflow” on page 56](#)
- [“Creating a VWorks device file” on page 58](#)
- [“Opening Diagnostics” on page 62](#)
- [“Creating a profile” on page 64](#)
- [“Initializing the device” on page 66](#)
- [“Placing a microplate on the plate stage” on page 68](#)
- [“About plate stage and applicator head positions” on page 69](#)
- [“Setting the plate stage vertical positions” on page 72](#)
- [“Setting the robot pickup angle teachpoint” on page 76](#)

Starting up and shutting down

About this topic

This topic describes how to start up and shut down the Microplate Labeler.

Starting up the device

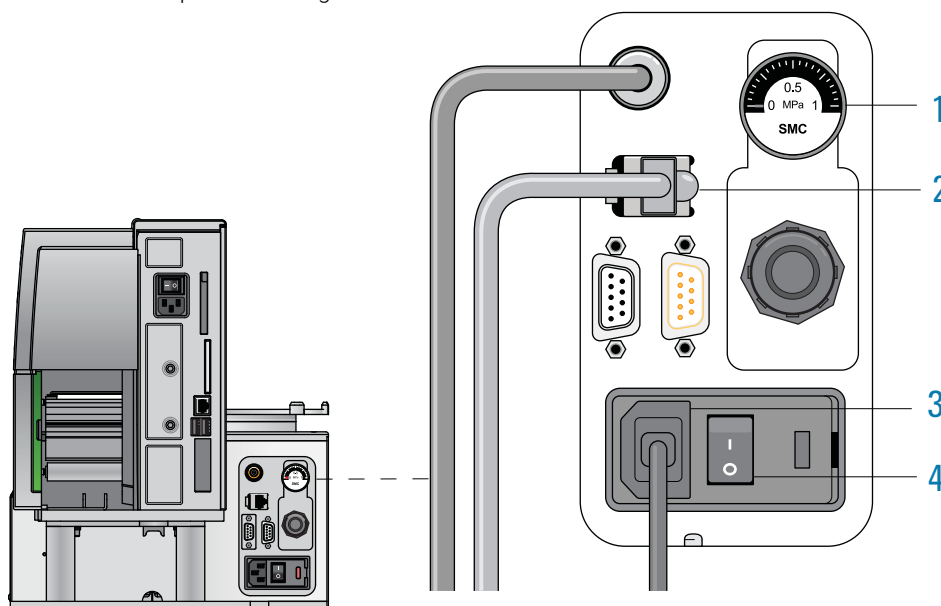
IMPORTANT

Follow the steps in the order shown to establish communication with the Microplate Labeler.

To start up a Microplate Labeler

- 1 Turn on the air supply.
- 2 On the Microplate Labeler connection panel, check the air pressure gauge (see figure, 1). Verify the air pressure is set within the following range:
0.55 MPa (80 psi) to 0.58 MPa (85 psi)

Figure Connection panel showing Ethernet connection



- 3 Verify that the communication cable (2) and power cord (3) are connected, but do not turn on the power yet.
Note: The figure shows an Ethernet connection. If you are using serial communication, the serial cable connects to the serial port. For more details, see ["Connecting the device to the computer" on page 41](#).
- 4 If you are using an Ethernet switch, turn on the power to the Ethernet switch.
- 5 Turn on the computer and the monitor, and wait for the Microsoft Windows operating system to start.
- 6 On the connection panel, press the power switch (4) to the **on (I)** position.

WARNING

The device components can move when you turn on the power and the air. Keep fingers, hair, clothing, and jewelry away from the Microplate Labeler while it is in motion. Never touch any of the moving parts or attempt to move labware while the Microplate Labeler is in operation. The device could pinch, pierce, or bruise you.

IMPORTANT

Ensure that the power switch on the printer remains in the **on** (I) position.

- 7 Start the automation control software, for example, start the VWorks software.
- 8 Initialize the device. For details, see ["Initializing the device" on page 66](#).

Shutting down the device

Shut down the Microplate Labeler before you:

- Install a barcode reader
- Perform maintenance on or clean the Microplate Labeler
- Move the Microplate Labeler

To shut down the Microplate Labeler:

- 1 Exit the automation control software.
- 2 Shut down the computer and turn off the monitor.
- 3 On the Microplate Labeler connector panel, press the power switch to the **off** (O) position.
- 4 Turn off the air supply.

Related topics

For information about...	See...
Hardware components	"Hardware overview" on page 12
Establishing communication with the Microplate Labeler	"Creating a VWorks device file" on page 58
Designing the label formats	"Creating label formats" on page 79
Setting up and running a labeling protocol in the VWorks software	VWorks Automation Control User Guide
Troubleshooting problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Setup workflow

About this topic

This topic provides an overview of the procedures required to set up the Microplate Labeler after the device has been installed. If the Microplate Labeler is being set up for the first time, use the workflows described below. If the device is part of an integrated Agilent Technologies laboratory automation system, the setup has already been performed, and additional setup should not be required.

Workflow

The following workflow describes the steps for initial setup of a Microplate Labeler when it is integrated in a lab automation system.

Note: If the Microplate Labeler is integrated in a third-party lab automation system, the third-party software controls the device via the Microplate Labeler ActiveX interface. See the [Microplate Labeler ActiveX User Guide](#). For additional information, see the third-party system documentation. For assistance, contact Agilent Automation Solutions Technical Support.

Step	For this task...	See...
1	Start up the Microplate Labeler.	"Starting up and shutting down" on page 54
2	<i>VWorks software only.</i> Create a device file, add the Microplate Labeler device, and set the device properties.	"Creating a VWorks device file" on page 58
3	Start Microplate Labeler Diagnostics.	"Opening Diagnostics" on page 62
4	Create a profile and initialize the device in Diagnostics.	<ul style="list-style-type: none">"Creating a profile" on page 64"Initializing the device" on page 66
5	Use Diagnostics to perform a print and apply test.	"Performing a print-and-apply test" on page 106
6	If necessary, adjust the plate stage height.	"Setting the plate stage vertical positions" on page 72
7	If applicable, verify the teachpoint for the robot pickup angle. If required, edit the teachpoint and update the profile.	"Setting the robot pickup angle teachpoint" on page 76
8	Perform a print and apply test.	"Performing a print-and-apply test" on page 106
9	To set up additional Microplate Labeler devices, perform steps 2 through 8 for each additional device. <i>Note:</i> You must create a profile with an appropriate Ethernet or serial setting for each device.	—

After the device setup is completed, you are ready to:

- Design your label formats
- Set up a labeling protocol using the VWorks Print and Apply task.

Related topics

For information about...	See...
Designing label formats	"Creating label formats" on page 79
Creating and running a labeling protocol in the VWorks software	VWorks Automation Control User Guide
Starting up the device	"Starting up and shutting down" on page 54
Reporting problems	"Reporting problems" on page 137

Creating a VWorks device file

About this topic

Read this topic if you are an administrator responsible for managing Agilent Technologies devices that are controlled by the VWorks software. This topic describes how to add and delete new Microplate Labeler devices in the VWorks software.

The VWorks software uses the information in a device file to communicate with and operate devices within the lab automation system.

- *If your computer was configured by Agilent Technologies.* The correct device configuration is already set up for communication with the Microplate Labeler. You are not required to create a new Microplate Labeler device in the software unless you want to reference different profiles. To establish communication, you must initialize the device.
- *If you configured your own computer.* You must add a device in the VWorks software for each Microplate Labeler in the system.

For detailed information about device files and associations with profiles, teachpoints, and labware definitions, see the [VWorks Automation Control User Guide](#).

Devices and device files defined

A device is an item in your lab automation system that has an entry in a VWorks software device file. A device can be a robot, an instrument, or a location in a lab automation system that can hold a piece of labware.

The device file (*.dev) stores information for all the devices in an integrated system, including:

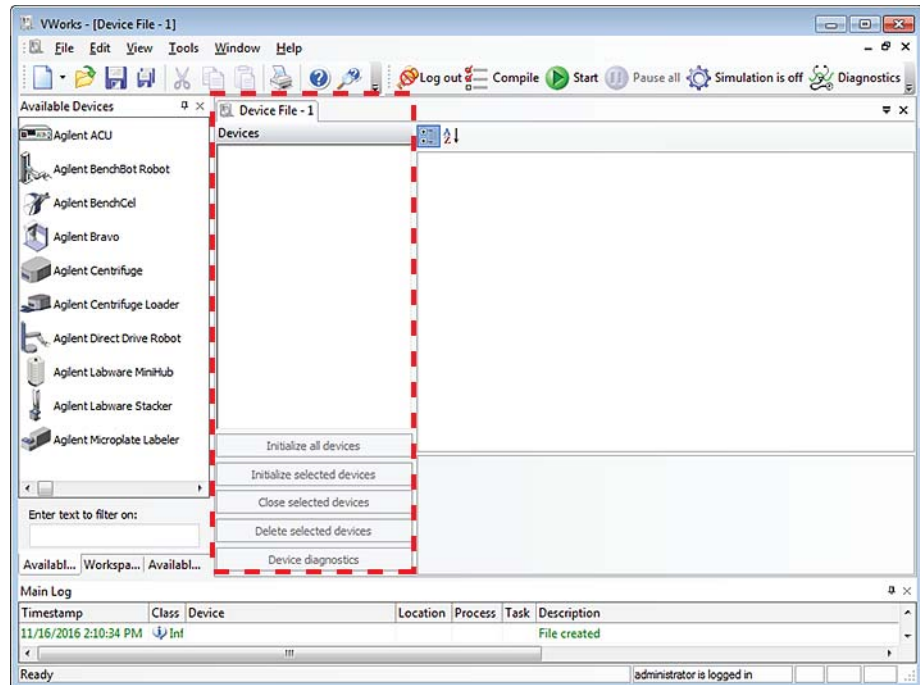
- Type of device (for example, Microplate Labeler device)
- Device configuration information (for example, approach height, allowed or prohibited labware, and so on)
- Profile to use

Creating a device file

If you are setting up the Microplate Labeler for the first time, you will create a device file. You add the Microplate Labeler device and the external devices to the device file.

To create a device file:

- 1 Log in to the VWorks software as an Administrator.
- 2 In the **VWorks** window, choose **File > New > Device**.
A Device File tab appears in the **VWorks** window.
- 3 Choose **File > Save**. In the **Save As** dialog box, type a file name (*.dev), select the following storage location, and click **Save**:
...\\VWorks Workspace\\Device Files



Adding the Microplate Labeler to a device file

Before you begin:

- Ensure that any devices are physically networked to the computer.
- Turn on the devices.

To add devices to a device file:

- 1 In the **VWorks** window, verify that the correct device file is open.

To open a device file, choose **File > Open**. In the **Open** dialog box, select your device file (*.dev), and then click **Open**. The device files should be stored in the following location:

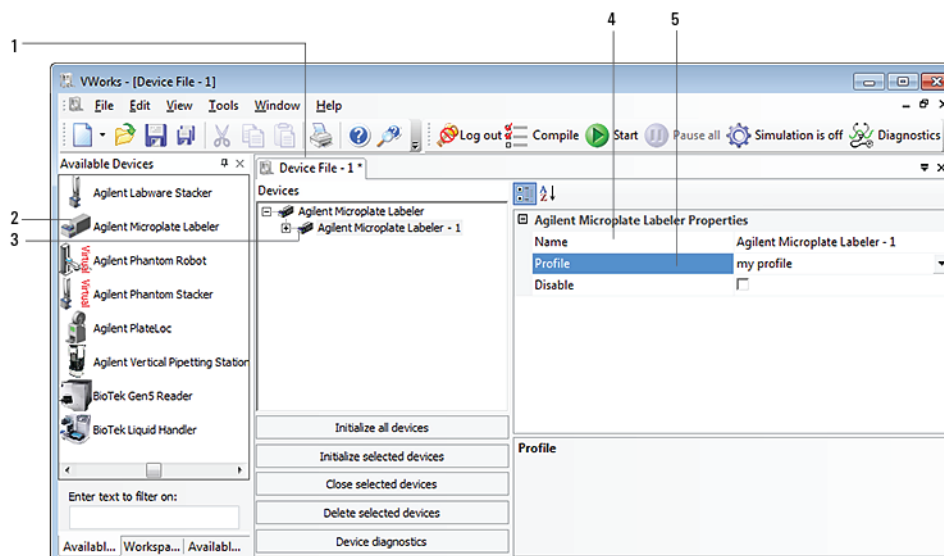
...\VWorks Workspace\Device Files

- 2 In the **Available Devices** area, double-click the **Microplate Labeler** icon. Or, drag the **Microplate Labeler** icon to the **Device File** tab.

Note: To show or hide the list of available devices, choose **View > Available Devices**.

4 Setting up the Microplate Labeler

Creating a VWorks device file



3 In the **Device File** tab, select the **Microplate Labeler-*n*** icon.

4 Under **Microplate Labeler Properties**, type a **Name** for the device. By default, the software assigns Microplate Labeler-*n*, and increments the number for each Microplate Labeler device that you add.

To identify the specific Microplate Labeler, the device name should include the device serial number.

5 In the **Profile** list, select a profile for the device.

If the **Profile** list is empty, open Diagnostics and create a profile. Then return to the **Profile** list under **Microplate Labeler Properties** and select the new profile.

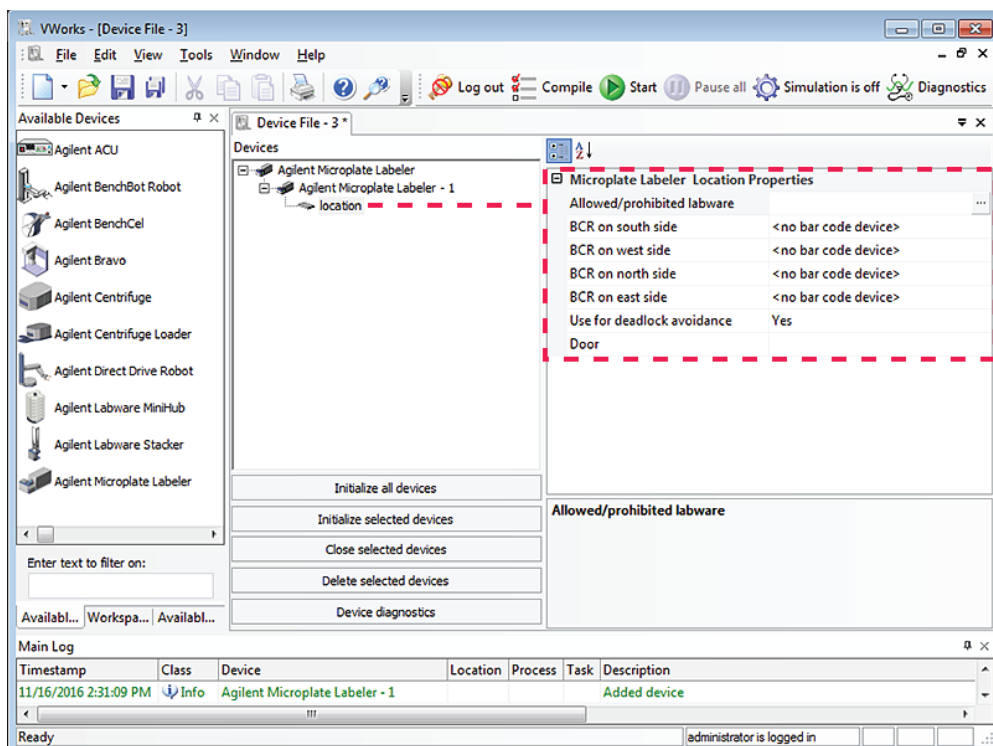
IMPORTANT

To use different configurations of the same device in different protocols, you can save time by creating a different device file for each configuration. For example, if you change a pipette head on a pipettor, you can simply open the device file that contains the device with the appropriate profile instead of editing the profile selection in the device file.



6 On the **Device File** tab, under the **Microplate Labeler** device icon, click the **location** icon. The corresponding properties appear.

4 Setting up the Microplate Labeler

Creating a VWorks device file



Set the desired values for the following properties. Use the default values for the remaining properties.

Property	Description
Allowed/prohibited labware	Optional. Click  if you want to specify labware restrictions for this location. The Allowed/prohibited labware dialog box appears. For details on the labware classes, see the VWorks Automation Control Setup Guide .
	Note: If the  button is not visible, click the empty field.

7 Select **File > Save**.

If you are creating a new device file, the Save As dialog box appears so that you can specify a name and location for your device file. Ensure the file type is ***.dev**. Alternatively, you can select **File > Save All** to save the device file and the current protocol file at the same time.

Related topics

For information about...	See...
Setup workflow	"Setup workflow" on page 56
Profiles	"Creating a profile" on page 64

Opening Diagnostics

About this topic

You use Microplate Labeler Diagnostics to set up and troubleshoot the device. This topic describes how to open Microplate Labeler Diagnostics from the VWorks software.

Note: For information on how to access Microplate Labeler Diagnostics using the ActiveX control, see the [Microplate Labeler ActiveX User Guide](#).

Opening Diagnostics from the VWorks software

To open Microplate Labeler Diagnostics from the VWorks software:

- 1 In the **VWorks software** window, ensure the correct device file is open.
To open a device file, choose **File > Open**, and then select the appropriate device file (*.dev) in the **Open** dialog box.
- 2 In the **Devices** area of the opened device file tab, highlight the device icon, and then click **Device diagnostics**.

The Microplate Labeler Diagnostics window appears.

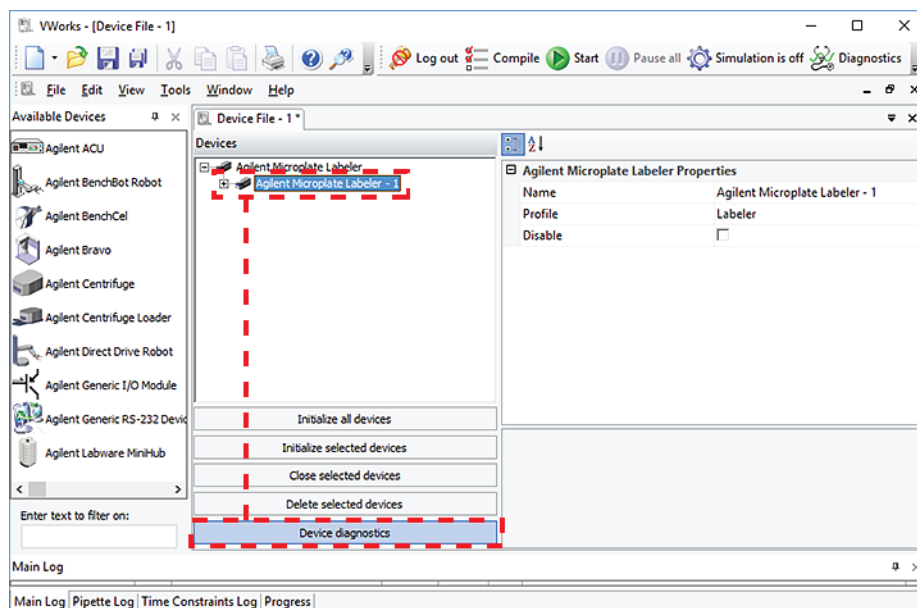
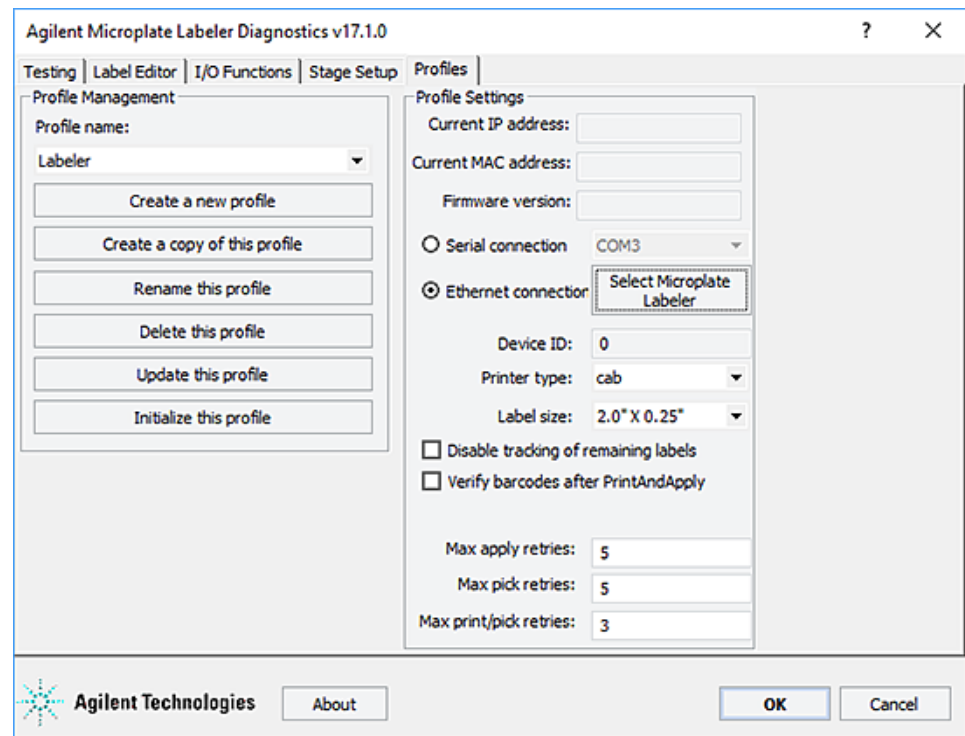


Figure Microplate Labeler Diagnostics



Related topics

For information about...	See...
Establishing communication with the device	"Creating a VWorks device file" on page 58
Profiles	"Creating a profile" on page 64
Designing label formats	"Creating label formats" on page 79
Setting up and running a VWorks labeling protocol	VWorks Automation Control User Guide
ActiveX controls	Microplate Labeler ActiveX User Guide

Creating a profile

About this topic

A profile contains the initialization settings associated with a particular device that are required for communication. Every Microplate Labeler on a given network requires its own profile.

This topic describes the following procedures:

- “Creating a profile” on page 65
- “Initializing the device in diagnostics” on page 66

Before you begin

CAUTION

Each profile can be used by multiple protocols. Deleting, renaming, or changing the parameters for a profile based on one protocol can invalidate other protocols that use the profile.

CAUTION

The plate stage teachpoints are associated with a specific device profile. If you delete the profile, the teachpoints are also deleted.

Ensure that Microplate Labeler Diagnostics is open. If it is not yet open, see “Opening Diagnostics” on page 62.

Figure Microplate Labeler Diagnostics—Profiles tab

The screenshot shows the 'Agilent Microplate Labeler Diagnostics v17.1.0' window with the 'Profiles' tab selected. The window has a menu bar with 'Testing', 'Label Editor', 'I/O Functions', 'Stage Setup', and 'Profiles'. The 'Profiles' tab is active, showing two main sections: 'Profile Management' on the left and 'Profile Settings' on the right.

Profile Management:

- Profile name: Labeler (dropdown menu)
- Create a new profile (button)
- Create a copy of this profile (button)
- Rename this profile (button)
- Delete this profile (button)
- Update this profile (button)
- Initialize this profile (button)

Profile Settings:

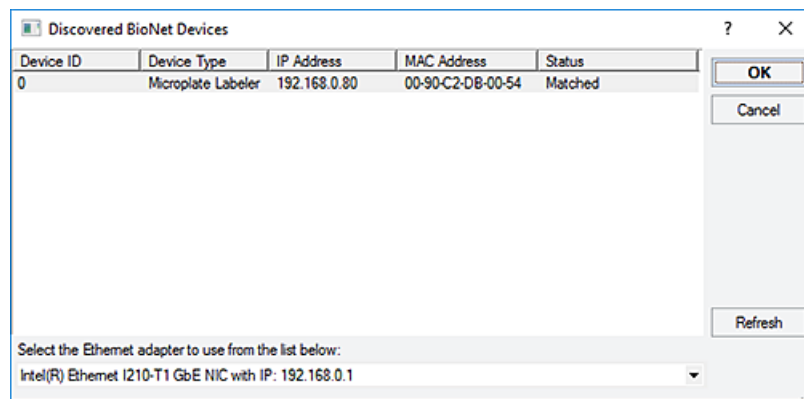
- Current IP address: (text field)
- Current MAC address: (text field)
- Firmware version: (text field)
- Serial connection: COM3 (dropdown menu)
- Ethernet connection: (radio button selected) Select Microplate Labeler (button)
- Device ID: 0 (text field)
- Printer type: cab (dropdown menu)
- Label size: 2.0" X 0.25" (dropdown menu)
- Disable tracking of remaining labels (checkbox, unchecked)
- Verify barcodes after PrintAndApply (checkbox, unchecked)
- Max apply retries: 5 (text field)
- Max pick retries: 5 (text field)
- Max print/pick retries: 3 (text field)

At the bottom of the window, there is an 'Agilent Technologies' logo, an 'About' button, and 'OK' and 'Cancel' buttons.

Creating a profile

To create a profile:

- 1 In the **Profiles** tab, do one of the following:
 - Click **Create a new profile**. In the **Create Profile** dialog box, type the name for the new profile, and then click **OK**.
 - Select a profile to use as a template, and then click **Create a copy of this profile**. To rename the copy, click **Rename this profile**.
- 2 Select one of the following communication connections:
 - a *Serial*. Select **Serial connection**, and then select which computer COM port to use for the connection. Go to [step 4](#).
 - b *Ethernet*. Select **Ethernet connection**, and then click **Select Microplate Labeler**. Proceed to [step 3](#).
- 3 *Ethernet connection only*. In the **Discovered BioNet Devices** dialog box, do the following:
 - a Click the **Select the Ethernet adapter to use from the list below**, and select the correct adapter for the device connection.
 - b In the list of devices that appear, select the Microplate Labeler device. If multiple Microplate Labeler devices are on the network, use the **MAC Address** to identify the Microplate Labeler device for this profile.
To successfully communicate with the Microplate Labeler device, the **Status** column must display **New** or **Matched**.
 - c Click **OK**.



- 4 In the **Printer type** list, ensure that the **cab** option is selected. The Microplate Labeler has a cab thermal printer.
- 5 If the optional barcode reader is installed, select **Verify barcodes after PrintAndApply**.
- 6 To save the profile, click **Update this profile**.

Note: You can use the default values for the remaining profile settings. For a description of each parameter, see ["Profiles tab" on page 160](#).

Related topics

For information about...	See...
Setup workflow	"Setup workflow" on page 56
Microplate Labeler Diagnostics	<ul style="list-style-type: none">• "Opening Diagnostics" on page 62• "Quick reference to Diagnostics software" on page 139
Designing label formats	"Creating label formats" on page 79
Setting up and running a VWorks labeling protocol	VWorks Automation Control User Guide
Troubleshooting problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Initializing the device

About this topic

To establish communication between the computer and the Microplate Labeler, you initialize the Microplate Labeler device. You can initialize the Microplate Labeler in the following ways:

- *Microplate Labeler Diagnostics*. To control the Microplate Labeler using Microplate Labeler Diagnostics, initialize the profile in Microplate Labeler Diagnostics.
- *VWorks window*. When you open a protocol or device file, a **Would you like to initialize the devices now?** message appears, and enables you to initialize the associated devices.

You can also initialize the device in the VWorks device manager.

Initializing the device in diagnostics

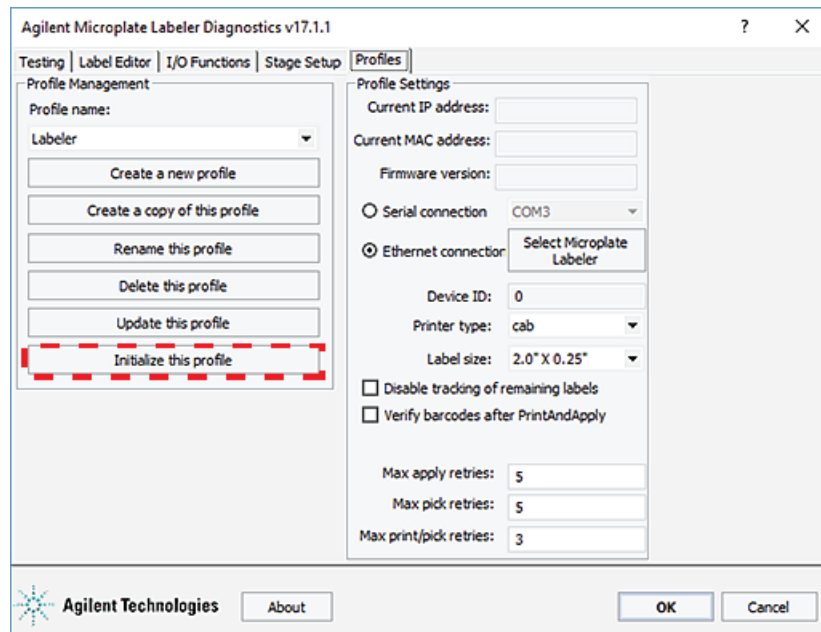
If you want to control the device using Microplate Labeler Diagnostics, you initialize the profile in diagnostics.

Note: For details on how to initialize the device using the ActiveX control, see the [Microplate Labeler ActiveX User Guide](#).

To initialize a profile in Microplate Labeler Diagnostics:

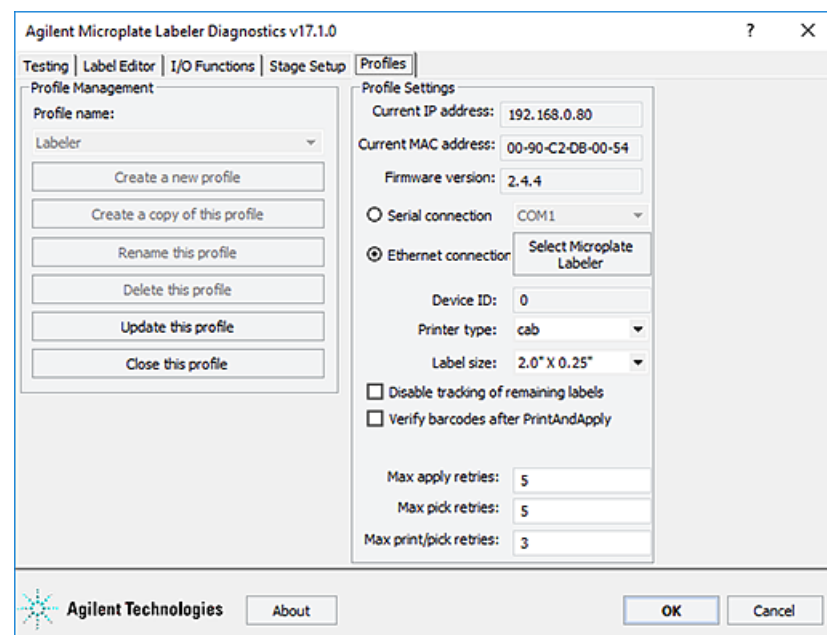
- 1 In the **Profiles** tab, select the profile from the **Profile name** list.
- 2 Click **Initialize this profile**.

Figure Initialize this profile in the Profiles tab



The Initialize this profile button label changes to Close this profile, as the following figure shows.

Figure Initialized profile in the Profiles tab



Initializing the device in the VWorks device manager

To initialize the device in the VWorks device manager:

- 1 In the **VWorks** window, ensure that the device file is open and the Microplate Labeler device icon appears in the **Devices** area.
- 2 In the **Devices** area, select the Microplate Labeler device, and then click **Initialize selected devices**.

Related topics

For information about...

Setup workflow

Microplate Labeler Diagnostics

See...

["Setup workflow" on page 56](#)

- ["Opening Diagnostics" on page 62](#)
- ["Quick reference to Diagnostics software" on page 139](#)

Placing a microplate on the plate stage

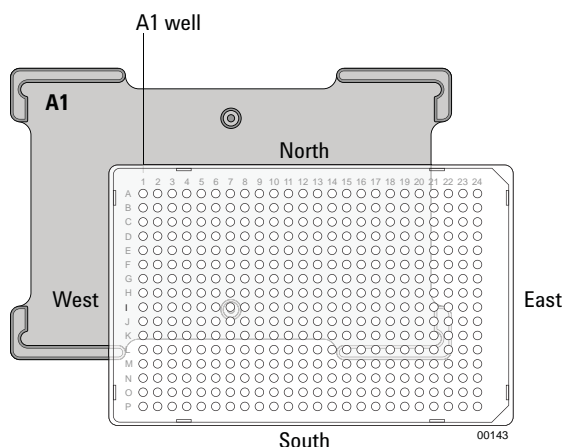
About this topic

This topic explains how to place a microplate on the plate stage manually.

Procedure

To place a microplate on the plate stage:

- 1 Orient the microplate so that the A1 well is in the far left corner, matching the A1 label on the plate stage.
- 2 Carefully lower the microplate onto the stage, making sure that the microplate lies flat.



When the microplate is on the plate stage, the sides of the microplate are referred to as north, south, east, and west as the figure shows.

Note: If you purchased a standalone Microplate Labeler and later decide to integrate the device with a BenchCel Workstation, a different type of plate stage may be required. Contact Agilent Automation Solutions Technical Support for more information.

Related topics

For information about...	See...
Next step in the setup workflow	"Setup workflow" on page 56
Selecting labware	"Labware considerations" on page 22
Plate stage and applicator head positions	"About plate stage and applicator head positions" on page 69

About plate stage and applicator head positions

About this topic

During operation, both the plate stage and applicator head move to various positions. This topic summarizes those positions and gives the background information required for the following procedures:

- ["Setting the plate stage vertical positions" on page 72](#)
- ["Setting the robot pickup angle teachpoint" on page 76](#)

Plate stage teachpoints

The following plate stage positions are called teachpoints:

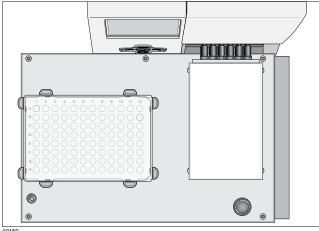
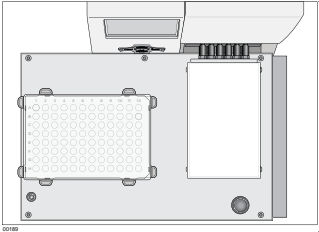
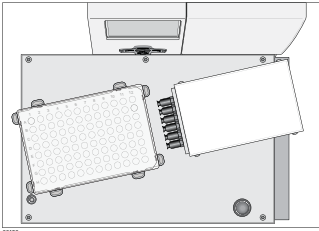
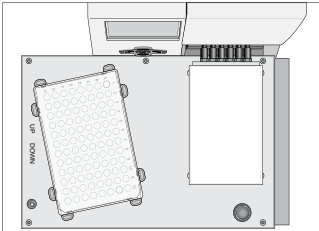
- *Robot pickup angle*. Specifies the position that the plate stage returns to when a print-and-apply cycle is completed.
- *Apply angle (east)*. Specifies the teachpoint position to which the plate stage rotates so that the east side faces the applicator head.
- *Read angle (east)*. Specifies the teachpoint position to which the plate stage rotates so that the east side faces the optional barcode reader.

Applicator head positions

The applicator head rotates to the printer to pick up a label, and rotates to the plate stage to apply a label. If the applicator head is out of alignment with either the printer or the plate stage, contact Agilent Automation Solutions Technical Support.

Positions summary

The following table summarizes the positions of the plate stage and applicator head at various points in a print-and-apply cycle.

Device Top View	Point in Cycle	Plate Stage Position	Applicator Head Position
	Start	Factory-set home position.	Factory-set position pointing towards the printer
	During microplate placing and pickup	At the robot pickup angle teachpoint. The default robot pickup angle value is 0.	Factory-set position pointing towards the printer
	As a label is applied	At the apply angle teachpoint (with east side of stage towards the applicator head) and at one of two heights defined by the drop stage value. The default angle value is 349, approximately.	Pointing towards the plate
	As a barcode is read	At the barcode angle teachpoint, with the east side oriented towards the optional barcode reader mounted to the side of the printer. The default angle value is 259, approximately.	Pointing towards the printer

Related topics

For information about...	See...
The general steps in the labeling process	"How the device applies a label" on page 27
Setup workflow	"Setup workflow" on page 56
Setting the top and bottom positions of the plate stage	"Setting the plate stage vertical positions" on page 72
Adjusting the robot pickup angle	"Setting the robot pickup angle teachpoint" on page 76
Moving the plate stage	"Using plate stage controls in Diagnostics" on page 109
Applicator head and plate stage	"Checking the basic applicator functions" on page 104

Setting the plate stage vertical positions

About this topic

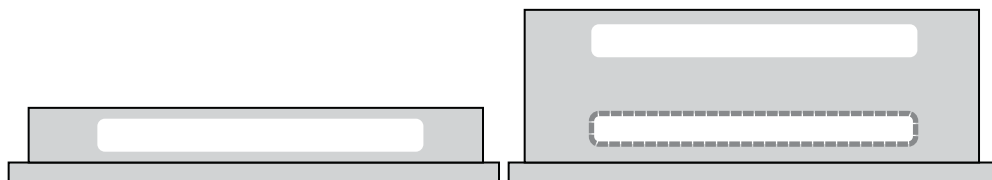
The Microplate Labeler accommodates a wide range of microplates, including deep-well microplates, full-skirt PCR microplates, and tube racks. For details on supported labware, see [“Labware considerations” on page 22](#).

The Microplate Labeler plate stage enables labeling at two vertical positions: top and bottom. You can adjust automatically to the top or bottom position to accommodate labware with special requirements, such as tall microplate skirts. The top and bottom positions are set at the factory for the most commonly used microplate sizes. This topic explains how to change the top and bottom positions if necessary.

When to change the vertical plate stage position

To accommodate different microplates sizes and skirt heights, you can adjust the top and bottom plate stage positions. Different types of microplates can have different skirt heights. A label positioned at the optimal height on one microplate will be either too high or too low on a microplate that has a significantly different skirt height.

Figure Examples of label positions of different sizes of labware



For shallow microplates, you might set the plate stage in the top position. For microplates with tall skirts, you might have to drop the plate stage to the bottom position. If you are using both types of microplates, you can use a different position for each.

You set the plate stage top and bottom positions mechanically. In the software, you specify whether the top or bottom position is used to label a specific microplate. Before labeling a microplate, the plate stage moves to the vertical position specified by the labware definition (VWorks software) or the schema (ActiveX).

Plate spacer

The Microplate Labeler is shipped with a plate spacer installed. If you are using a microplate that cannot be labeled properly through adjustment of the plate stage height, you can remove the plate spacer. When the plate spacer is removed, labels can be placed 0.635-cm (0.25-in) higher on the microplate, but the adjustment also affects how close to the bottom of the microplate a label can be placed. For more information, contact Agilent Automation Solutions Technical Support.

Plate stage positions for microplates of the same height

If all of the microplates that use have the same skirt height, you can set the top and bottom positions to the same height. This enables you to determine if one of the stage height positions has drifted. If any vertical movement occurs in the plate stage when you use the drop stage command in Microplate Labeler Diagnostics, drift has occurred.

Before you start

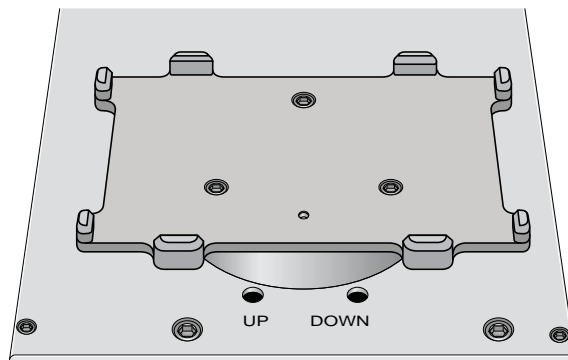
- Open Microplate Labeler Diagnostics. For details, see [“Opening Diagnostics” on page 62](#).
- Locate a 2.5-mm hex wrench.

Procedures

The top and bottom heights of the plate stage are determined by mechanical stops that you position by turning the following set screws located near the plate stage:

- UP sets the top position.
- DOWN sets the bottom position.

Figure Plate stage adjustment set screws (UP and DOWN)



The procedures for setting the top and bottom positions are given separately.

Setting the top position

To set the top position of the plate stage:

- 1 Place the microplate that you want to use at the top position on the plate stage.
- 2 In **Microplate Labeler Diagnostics**, click the **Stage Setup** tab.
- 3 Under **Teachpoints**, locate **Apply angle (east side)**, and click **Move here** to move the plate stage to the apply angle teachpoint.
- 4 Click the **I/O Functions** tab, and click **Raise stage**, if necessary, to move the plate stage to the top position.
- 5 To check the top position:
 - a In the **I/O Functions** tab, click **Rotate to stage**, and then click **Extend head** to extend the applicator head.
 - b Examine the alignment between the application head vacuum pads and the side of the microplate.

4 Setting up the Microplate Labeler

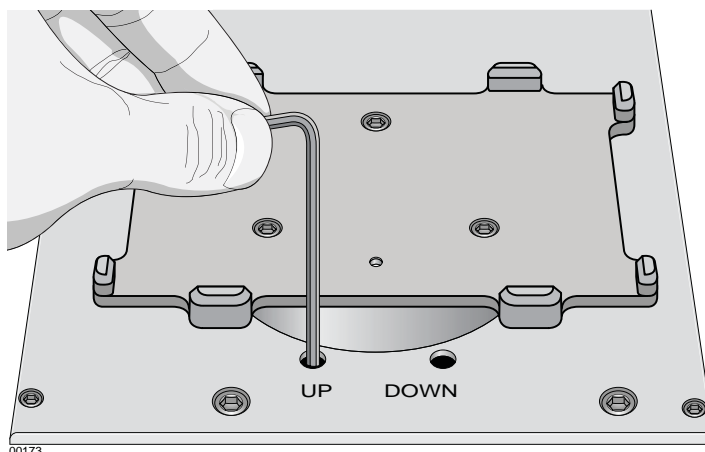
Setting the plate stage vertical positions

Your goal is to position the vacuum pads at the desired height of the label on the microplate.

- c Click **Retract head**, and then click **Rotate to printer** to move the applicator head out of the path of the plate stage.

If the height appears to be correct, go to [step 8](#) to home the stage and run a print-and-apply test. If the position requires adjustment, go to [step 6](#).

- 6 Select the **Disable stage auto-repositioning** check box, and then manually rotate the plate stage to gain access to the UP and DOWN set screws.
- 7 Insert the 2.5-mm hex wrench into the UP set screw. Turn counterclockwise to raise the plate stage, or turn clockwise to lower the plate stage.
Raise or lower the plate stage based on how much you want the label to move from where it has been placed.



- 8 In the **Stage Setup** tab, click **Home stage**.
- 9 To check the position:
 - a In **Microplate Labeler Diagnostics**, click the **Testing** tab.
 - b Select **Print and apply**, and then click **Run test**.
- 10 Examine the vertical alignment of the label on the microplate.
If necessary, repeat [step 5](#) to [step 8](#) until the adjustment is correct. After adjusting the top position, use the following procedure to check the bottom position.

Setting the bottom position

To set the bottom position of the plate stage:

- 1 Place the microplate that you want to use at the lower position on the plate stage.
- 2 In the **Stage Setup** tab, locate **Apply angle (east side)**, and click **Move here** to move the plate stage to the apply angle teachpoint.
- 3 Click the **I/O Functions** tab, and click **Drop stage**, if necessary, to move the plate stage to the bottom position.
- 4 To check the bottom height position:
 - a Click **Rotate to stage**, and then click **Extend head** to extend the applicator head.
 - b Examine the alignment between the application head vacuum pads and the side of the microplate.

Your goal is to position the vacuum pads at the desired height of the label.

- c Click **Retract head**, and then click **Rotate to printer** to move the applicator head out of the path of the plate stage.
If the position appears to be correct, go to [step 7](#) to run a print-and-apply test. If the position requires adjustment, proceed to [step 5](#).
- 5 Ensure the **Disable stage auto-repositioning** check box is selected. Manually rotate the plate stage to gain access to the UP and DOWN set screws.
- 6 Insert the 2.5-mm hex wrench into the DOWN set screw. Turn clockwise to raise the plate stage, and turn counter-clockwise to lower the plate stage.
- 7 In the **Stage Setup** tab, click **Home stage**.
- 8 To check the position:
 - a In **Microplate Labeler Diagnostics**, click the **Testing** tab.
 - b Select **Print and apply**, and then click **Run test**.
- 9 Examine the vertical alignment of the label on the microplate.
If necessary, repeat [step 4](#) to [step 8](#) until the adjustment is correct.
- 10 Ensure that the **Disable stage auto-repositioning** check box is clear (not selected).

About automatically adjusting the stage height during a run

The procedure for setting the plate stage height parameter varies depending on which software you use to control the Microplate Labeler:

Automation control software	See...
<i>VWorks software.</i> In the labware definition of a microplate that uses the plate stage bottom position, select the option to lower the plate at the Microplate Labeler. This parameter is in the Labware Editor—Plate Properties tab.	VWorks Automation Control Setup Guide
<i>ActiveX.</i> When setting up a print schema, set the dropStage parameter to TRUE (bottom position) or FALSE (top position).	Microplate Labeler ActiveX User Guide

Related topics

For information about...	See...
Starting Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Setup workflow	"Setup workflow" on page 56
Moving the plate stage	"Using plate stage controls in Diagnostics" on page 109
How to resolve problems	"Reporting problems" on page 137

Setting the robot pickup angle teachpoint

About this topic

The robot pickup angle is the position that the plate stage returns to after a print-and-apply cycle is completed. The teachpoint for the robot pickup angle is set at the factory.

If your Microplate Labeler is:

- A standalone device, this teachpoint should not require adjustment.
- Integrated in a BenchCel Workstation, this teachpoint is already set for you.
- Integrated in a third-party lab automation system, this teachpoint might require adjustment to accommodate your robot's geometry.

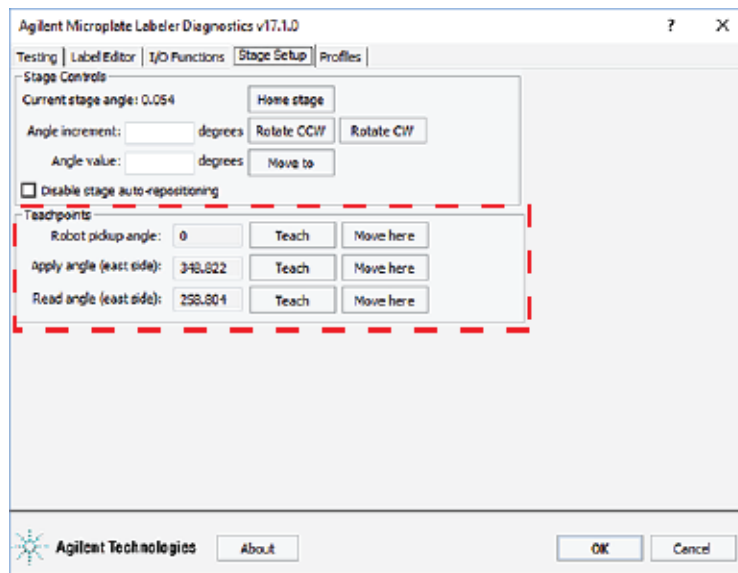
This topic explains how to adjust the robot pickup angle and set the teachpoint so that a robot can deliver or pick up a microplate from the plate stage.

CAUTION

The Apply angle (east) and Read angle (east) teachpoints are set at the factory. Do not attempt to set these teachpoints. If you think either of these two teachpoints require adjustment, contact Agilent Automation Solutions Technical Support.

Viewing the robot pickup angle

The Stage Setup tab in Microplate Labeler Diagnostics displays the teachpoint settings.



To view the robot pickup angle:

- 1 Ensure that the Microplate Labeler device is initialized. For the VWorks software, see [“Initializing the device in the VWorks device manager” on page 68](#).
- 2 Open **Microplate Labeler Diagnostics**.
- 3 Click the **Stage Setup** tab.

- 4 Under **Teachpoints**, check the value for the **Robot pickup angle**.

Two methods for setting the robot pickup angle

You can use either of the following procedures for setting the robot pickup angle:

- Specify an angle in the **Angle value** box or the **Angle increment** box.
- Manually move the plate stage to a position and then set its position as the teachpoint.

Specifying a new angle

To set the robot pickup angle by specifying the angle:

- 1 Ensure the device is initialized, and **Microplate Labeler Diagnostics** is open.
- 2 Ensure that the applicator head is pointing towards the printer.
If necessary, click the **I/O Functions** tab, and then click **Rotate to printer**. The applicator head rotates towards the printer, moving it out of the plate stage rotation path.
- 3 Under **Stage Controls**, type a value in the **Angle value** box, and then click **Move to**.
Alternatively, type a value in the **Angle increment** box, and then click **Rotate CCW** or **Rotate CW**.
- 4 If the position is correct, under **Teachpoints**, locate **Robot pickup angle**, and then click **Teach**.
- 5 In the **Profiles** tab, click **Update this profile**.

Manually moving the plate stage

To set the robot pickup angle by manually moving the plate stage:

- 1 Ensure the device is initialized, and **Microplate Labeler Diagnostics** is open.
- 2 Ensure that the applicator head is pointing towards the printer.
If necessary, click the **I/O Functions** tab, and then click **Rotate to printer**. The applicator head rotates towards the printer, moving it out of the plate stage rotation path.

CAUTION

Before moving the plate stage, make sure that the applicator head is not in the path of the plate stage.

- 3 Click the **Stage Setup** tab, and select **Disable stage auto-repositioning**.
- 4 Manually rotate the plate stage to the desired position.
- 5 Under **Teachpoints**, locate **Robot pickup angle**, and then click **Teach**.
- 6 Clear the **Disable stage auto-repositioning** check box.
- 7 In the **Profiles** tab, click **Update this profile**.

4 Setting up the Microplate Labeler

Setting the robot pickup angle teachpoint

Related topics

For information about...	See...
Microplate Labeler Diagnostics	<ul style="list-style-type: none">• "Opening Diagnostics" on page 62• "Quick reference to Diagnostics software" on page 139
Plate stage positions	"About plate stage and applicator head positions" on page 69
Designing label formats	"Creating label formats" on page 79
Setting up and running a labeling protocol	<i>VWorks Automation Control User Guide</i>



5 Creating label formats

The Microplate Labeler includes templates for label formats that are ready to use or that you can customize. For an overview of the templates, see [“Templates for barcode formats” on page 165](#). This chapter describes the label formats and how to create them and customize the templates.

The topics are:

- [“About label formats and content” on page 80](#)
- [“Creating and editing label formats” on page 84](#)
- [“Changing the field size and other attributes” on page 92](#)
- [“Removing unwanted label format data” on page 96](#)
- [“Barcodes and supported symbologies” on page 97](#)

About label formats and content

About this topic

This topic has the following sections:

- ["Overview" on page 80](#)
- ["Label format" on page 80](#)
- ["Label format storage and uploading" on page 83](#)
- ["About specifying the label content" on page 83](#)

Overview

To create a label, the software requires the following:

- *Label format.* The number and arrangement of fields on a label, and the field type, size, and other attributes.
Each label printed by the Microplate Labeler contains up to six fields of data. Only one field can be a barcode field. The remaining fields can be human-readable text.
- *Label content.* The data that the software substitutes for the text and barcode fields in the label format when the label is printed.

When you run a labeling protocol using the VWorks software, the label format loads from the printer's memory. The software substitutes the data (label content) for the text and barcode fields in the label format, and then prints the label.

Label format

The Microplate Labeler contains a set of template label formats that are ready to use or that you can customize for your lab. For an overview of the templates, see ["Templates for barcode formats" on page 165](#).

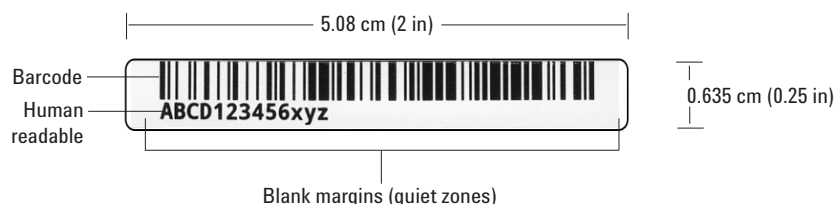
Label format fields and label field data

A label format can consist of up to six label fields. Associated with every label field is a set of label field data that defines the following:

- Field type: human-readable text or barcode
- Font family used for printing the human-readable text fields
- Barcode symbology used for text encoding if it is a barcode field
- Position of the field on the label
- Attributes of the field such as field size
- Contents of the field for a test print from the Label Editor tab

The following figure shows an example of a label with two fields: one barcode field and one human-readable text field.

Figure Example label with Code 128 barcode field and human-readable text field



Label design considerations

If you want to design your own label format, consider the following parameters:

- *Symbology encoding characteristics.* Which characters does the symbology encode, for example, alphanumeric or numeric? What is the data density of the symbology? For instance, the Code 128 symbology can encode more data in the same space than the Code 39 symbology.
- *Symbology size attributes.* What size settings will you use for the narrow-bar width and the height of the bars in the barcode? What will the length and height of the barcode be?

Smaller size attributes allow greater data density but decrease the readability of the symbol. In general, a 0.25 mm (0.01 in) narrow bar width offers very good readability. A narrow bar width smaller than 0.17 mm (0.067 in) will be very hard to read and should not be used.

- *Font type and size for human-readable text.* The Agilent templates use the Droid Mono Bold font, which Agilent Technologies recommends for most applications. The font size depends on the size of the other fields on the label.

For example, the label in the preceding figure uses a 6-point font.

- *Proportions of fields on the label.* Increasing the size of the barcode symbol will improve readability of the symbol but reduce the amount of space left for other fields on the label.

The example in the preceding figure shows a label where the barcode fills approximately 80% of the label area, while the human-readable field fills approximately 20% of the label area.

- *Blank margins or white space.* To ensure that the barcode reader can read a barcode, the label design should include the blank margins described in the following section.

Blank margins in the label design

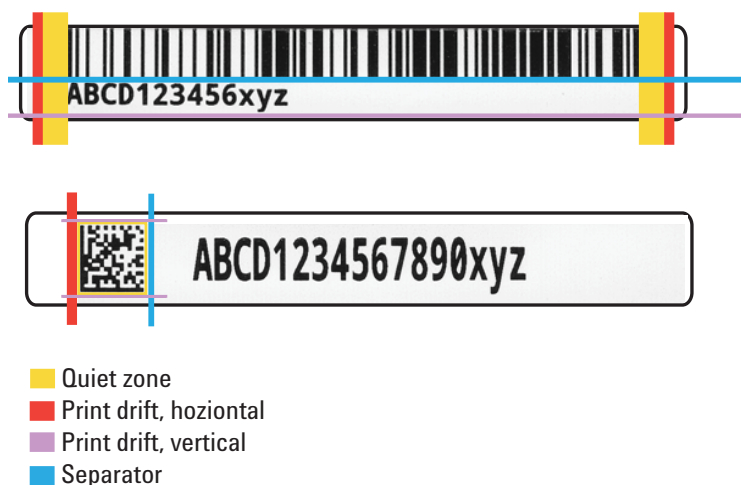
The label design should include the following blank margins:

- *Quiet zones.* The barcode symbology requires quiet zones on each end to facilitate machine readability. The required size of the quiet zone can vary depending on the symbology.

For example, the minimum quiet zone for Code 128 is 10 times the width of the narrowest bar or space in the barcode. In general, you should allow a 3.81 mm (0.15-inch) margin on both the right and left sides of a linear symbol to accommodate quiet zones and other factors.

- *Print drift allowance.* Include blank space to compensate for horizontal and vertical drift between the print and the edges of the label, for example, as a result of the label media shifting relative to the printhead.
 - The vertical print drift should be no more than ± 0.25 mm (0.01 in.).
 - The horizontal print drift should be no more than ± 0.75 mm (0.03 in.).
- *Separator between fields.* Although no print drift occurs between two fields, allow for some blank space between fields to facilitate readability.

Figure Minimum blank margins for Code 128 (top) and Data Matrix (bottom) symbologies



At a minimum, the required margin sizes on these two label designs are:

Parameter	1D Code 128 symbology	2D Data Matrix symbology
Quiet zone	Required on each end: 2.5 mm (0.1 in) 10 * narrow bar width, where, narrow bar width = 0.25 mm (0.01 in)	Required on all sides: 0.30 mm (0.0117 in) 1 * module width, where, Module width (dot size) = 0.30 mm (0.0117 in)
Print drift allowance, horizontal	On each end of the quiet zone: 0.76 mm (0.03 in)	On each end of the side quiet zones: 0.76 mm (0.03 in)
Print drift allowance, vertical	Below bottom field on label: 0.25 mm (0.01 in)	Above and below the top and bottom quiet zones: 0.25 mm (0.01 in)
Separator between fields	0.25 mm (0.01 in)	2.5 mm (0.1 in)

The Data Matrix symbology requires quiet zones on all sides of the barcode. The Data Matrix symbology features an L-shaped finder pattern on the left and bottom sides that serves to locate the start of the symbology, and a timing pattern (opposite the L shape) to indicate the symbology end for a barcode reader.

Label format storage and uploading

You use the Label Editor tab in Microplate Labeler Diagnostics to create and edit label formats, and to upload the label formats to the printer.

Label formats must be stored in the printer so that they are available for use. The printer can store up to 20 label formats.

Label formats can also be saved in XML files. Before you can use a format that is stored in an XML file, you must first upload the label format to the printer.

To modify a label format, you load the format into the Microplate Labeler Diagnostics—Label Editor tab.

About specifying the label content

When configuring a VWorks labeling protocol, you select a predefined label format that has been loaded in the printer, and then specify the content for the fields that have been configured in that particular label format. The method for specifying the label content varies depends on which automation control software you use.

Software that controls the device	See...
<i>VWorks software.</i> You create a protocol that contains a Print and Apply task. You select the label format and field content when setting the task parameters. <i>Note:</i> You set the plate stage height in the labware definition. You specify which sides of the microplate to label in the plate process parameters.	VWorks Automation Control User Guide
<i>ActiveX control.</i> For a device integrated in a third-party lab automation system, you can use the ActiveX controls to define the label format and content.	Microplate Labeler ActiveX User Guide

Related topics

For information about...	See...
Workflow for running an integrated Microplate Labeler using the VWorks software	"Overall setup workflow" on page 28
Barcode terminology and symbology	"Barcodes and supported symbologies" on page 97
Customizing a label format template	"Creating and editing label formats" on page 84

Creating and editing label formats

About this topic

The Microplate Labeler contains a set of template label formats that are ready to use or that you can modify. For an overview of the templates, see [“Templates for barcode formats” on page 165](#).

This topic describes how to load a label format and then customize it to meet the requirements of your lab.

For a description of label formats and content, see [“About label formats and content” on page 80](#).

Before you start

The following workflow assumes that:

- Microplate Labeler Diagnostics is open. For details, see [“Opening Diagnostics” on page 62](#).
- The profile for your device is initialized. For details, see [“Initializing the device in diagnostics” on page 66](#).

CAUTION

Changes that you make to a label format are kept in memory only. To avoid losing changes to a label format, you must upload the revised format to the printer or save the changes to an XML file before selecting a different label format or closing Microplate Labeler Diagnostics.

Workflow for creating or editing a label format

Step	For this task...	See...
1	Load a label format that you want to customize.	“Loading a label format in the Label Editor” on page 85
2	If desired, add additional fields to the label format by right-clicking the Label Editor preview box.	“Adding a field to a label format” on page 86
3	Edit the properties of a field.	<ul style="list-style-type: none">• “Editing the field properties” on page 87• “Changing the field size and other attributes” on page 92
4	Repeat steps 2 and 3 for the other fields in the label.	

Step	For this task...	See...
5	<p>Upload the edited label format to the printer.</p> <p>Before a label format is available for printing, the format must be uploaded to the printer.</p> <p>Optionally, save a backup copy to an XML file.</p>	"Uploading and saving a format" on page 91.
6	Print a test label to check your changes.	"Printing a test label from the Label Editor tab" on page 92

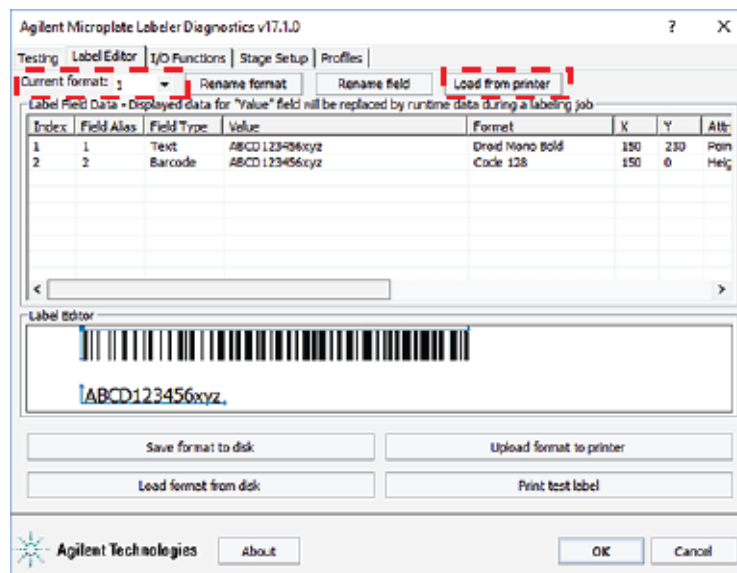
Loading a label format in the Label Editor

You can load the label format from the printer or from an XML file on the computer.

Note: The Microplate Labeler supports label formats developed for the cab A2+ printer only.

To load a label format from the printer:

- 1 In **Microplate Labeler Diagnostics**, click the **Label Editor** tab.
- 2 In the **Current format** list, select a format, and then click **Load from printer**.



If the selected format has not been defined, the Label Field Data table and the Label Editor preview box are blank. Otherwise, data appear in the table, and a representation of the format appears in the Label Editor preview box.

Alternatively, you can load a label format from an XML file on the computer.

To load a label format from an XML file:

- 1 In the **Label Editor** tab, click **Load format from disk**.
- 2 In the **Open** dialog box, navigate to the file storage location, select the XML file, and then click **Open**.

By default, the label format templates are installed in the following folder:

C:\VWorks Workspace\Microplate Labeler Label Formats

Renaming a label format

To rename a label format:

- 1 In the **Current format** list, select the desired format and then click **Rename format**.
- 2 In the dialog box that appears, type the format name, and then click **OK**. The new name appears in the **Current format** list.

Adding a field to a label format

You can add up to six fields in the label. Only one field can be a barcode. The remaining fields can be human-readable text.

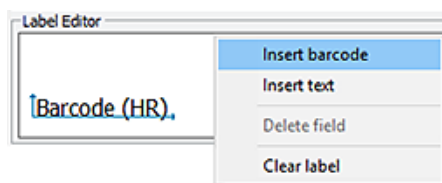
To add a field to a label format:

- 1 Ensure that the format you want to edit is loaded.
- 2 Right-click in the **Label Editor** preview box, and then choose one of the following from the shortcut menu:

- **Insert text.** Available for any field.
- **Insert barcode.** Available for field 2 only.

Note: If you want the label to contain a barcode only, you can add a text field, add a barcode field, and then delete the text field.

The default data fills a row in the Label Field Data, and a corresponding field appears in the preview box.



Editing the field properties

This section describes how to change the following field properties:

- Alias
- Value
- Format
- Position (x, y coordinates)

To change the field size and other attributes, see [“Changing the field size and other attributes” on page 92](#).

To clear or remove data from the format, see [“Removing unwanted label format data” on page 96](#).

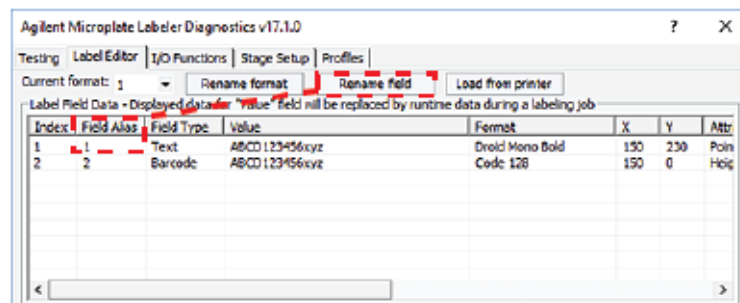
For a quick reference to each column in the Label Field Data table, see [“Label Editor tab” on page 144](#).

Assigning an alias to a field in the format

To assign an alias to a field in the label:

- 1 In the **Label Field Data** table, select the desired field (Index 1 to 6), and then click **Rename field**.
- 2 In the dialog box that appears, type a name, and click **OK**. The name appears in the Field Alias column for the selected field.

For example, you might change the alias from a number to the name, *Date*.



Changing the value

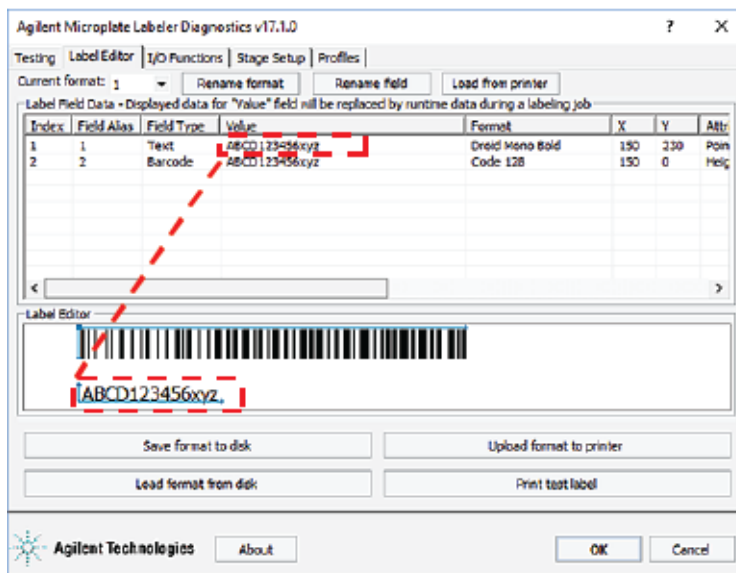
The value property that you specify in the Label Editor tab is used only when performing a test print from the Label Editor tab. When you run a labeling protocol using the VWorks software, the value of each field comes from the data source that you select in the VWorks software.

A field's value parameter determines:

- *Human-readable field*. The actual text that is printed during a test print.
- *Barcode field*. The actual data that is encoded into the barcode for a test print. The barcode text should follow the rules of the specified symbology, for example, limited to numbers only or uppercase letters and numbers.

To change the value:

- 1 In the **Field Data Table**, click the entry in the **Value** column for the field that you want to edit. The row is highlighted.
- 2 Click the value once more to enable editing, and then type a new value that is about the same length as the text for the production labeling.



IMPORTANT

Ensure that the characters you enter for a barcode field are supported by the selected format (symbology).

Note: The Label Editor preview provides an approximate representation of the label layout. To view the actual field sizes and positions on the label, print a test label.

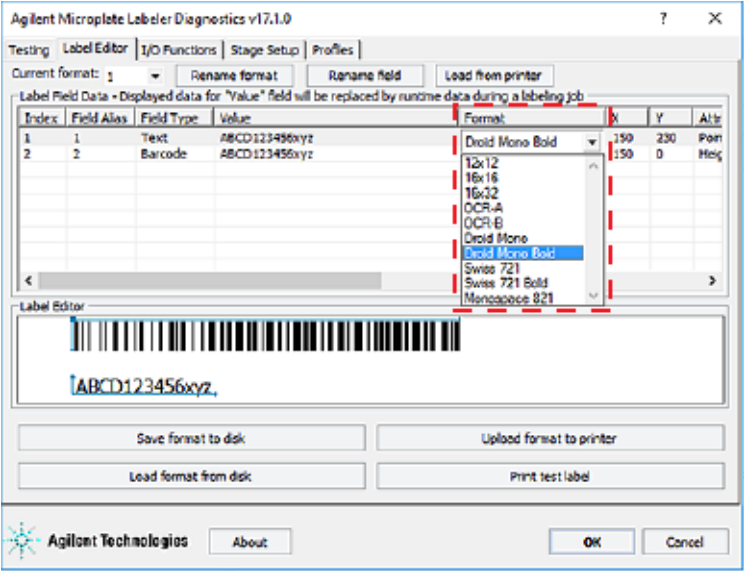
Changing the format

A field format determines the printed appearance of a field. For example, the font selection for a text field or the symbology selection for a barcode field.

To change the format of a field:

- 1 In the **Label Field Data** table, click the name in the **Format** column for the field that you want to edit. The row is highlighted.
- 2 Click the format name once more to display the list, and then select the desired text font or barcode symbology.

The list changes based on the field type (text or barcode).



IMPORTANT

For barcode fields, make sure that the symbology you choose supports all of the characters in your field's data. Also, if you are using a barcode reader, make sure that symbology you choose can be read by your barcode readers. For a description of the available symbologies for the Microplate Labeler, see ["Barcodes and supported symbologies"](#) on page 97.

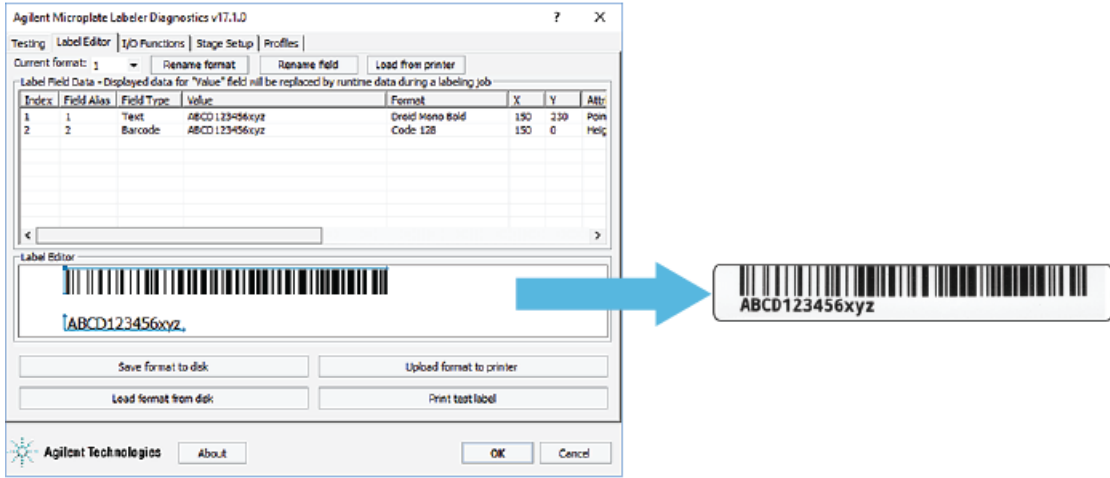
Note: The Microplate Labeler supports label formats developed for the cab A2+ printer only.

Positioning the fields on the label

The Label Editor tab provides two methods for positioning the field on the label:

- *Label Editor preview box.* You can drag each field to an approximate position in the preview box. However, the preview is not precise, and you must test print the label to see the actual field sizes and positions, and then adjust as necessary.

Figure Example of format in the preview box and printed label



5 Creating label formats

Creating and editing label formats

- *X and Y columns.* The X and Y values in the Label Field Data table correspond to the printer's x- and y-coordinates for the label, where the origin is at the top left corner of the label.
 - *x-coordinate.* The horizontal start position, the distance between the label's left edge and the field's left edge.
 - *y-coordinate.* The vertical start position, the distance between the label's top edge and the text field (bottom left corner) or barcode field (upper left corner).

Label Field Data - Displayed data for "Value" field will be replaced by runtime data during a labeling job

Index	Field Alias	Field Type	Value	Format	X	Y	Attr
1	1	Text	ABCD123456xyz	Droid Mono Bold	150	230	Point
2	2	Barcode	ABCD123456xyz	Code 128	150	0	High

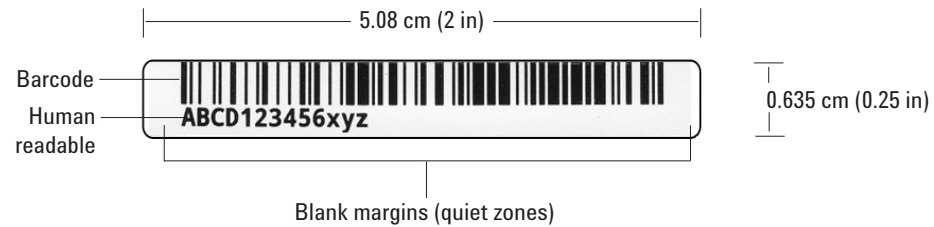
To position the field's starting point using the X and Y values, you calculate the position based on the following:

- Label size: 0.25 by 2.0 in (0.0635 by 5.08 cm)
- X and Y unit of measure: 0.001 in (0.0254 mm)

Given the label size, the value ranges are Y: 0 to 250, and X: 0 to 2000.

For example, suppose you want to create a label similar to the one in the following figure. In this example, the upper edge of the barcode field is flush with the label's top edge, the barcode field has a blank margin (quiet zone) on each end to allow readability, and a text field is aligned on the left under the barcode field. The following table provides the X and Y values for the label in the figure.

Figure Example barcode and text field positions on label



Field type	X, Y values	Position on label
Barcode	X = 150	The field left edge is 0.150 in (0.38 cm) from the label left edge.
	Y = 0	The field top edge is 0.0 in from the label top edge.
Text	X = 150	The field left edge is 0.150 in (0.38 cm) from the label left edge.
	Y = 230	The field bottom edge is 0.230 in (0.58 cm) from the label top edge.

To use the X and Y columns to position a field:

- 1 In the **Label Field Data** table, click the value in the **X** column for the field that you want to edit. Click the value again to enable editing, and type the new value.
- 2 Click the value in the **Y** column for the field that you want to edit. Click the value again to enable editing, and type the new value.

In addition to the field's x, y coordinates, the field size attributes affect the field's placement on the label. Initially, you can use the default values in the Attributes column. You can upload the label format to the printer, print a test label, and then evaluate whether to adjust the size or placements of the fields.

Uploading and saving a format

After you have created or edited a label format, you must upload it to the printer before it can be used. You might also want to save it in an XML file on the computer, especially as label formats can be accidentally overwritten.

To upload a format to the printer:

- 1 In the **Label Editor** tab, click **Upload format to printer**.

To save a format to an XML file:

- 1 In the **Label Editor** tab, click **Save format to disk**.
- 2 In the **Save As** dialog box, specify the XML file name and the file storage location, and click **Save**.

Note: The software saves one label format per XML file.

Printing a test label from the Label Editor tab

After you upload a label format to the printer, you can check your changes by printing a test label.

To print a test label:

- 1 In the **Label Editor** tab, click **Print test label**, or press the green button on the device. Alternatively, you can perform test print-and-apply cycles using the Testing tab. See ["Performing a print-and-apply test" on page 106](#).

Related topics

For information about...	See...
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Label format and label content	"About label formats and content" on page 80
Performing a print and apply test	"Performing a print-and-apply test" on page 106
Performing a test barcode read	Documentation for your barcode reader
Setting the parameters for the label content	VWorks Automation Control User Guide

Changing the field size and other attributes

About this topic

When designing a label format, you can change the size of the fields to make the label more readable or to fit more information on the label. This topic describes how to alter the size of a printed text or barcode field.

Before you start

If you have not already done so, already:

- Load the label format that you want to modify. See ["Loading a label format in the Label Editor" on page 85](#).
- Make sure you understand how the fields are positioned on the label. See ["Positioning the fields on the label" on page 89](#).
- Consider the label size when planning the format: 0.0635 by 5.08 cm (0.25 by 2.0 in).

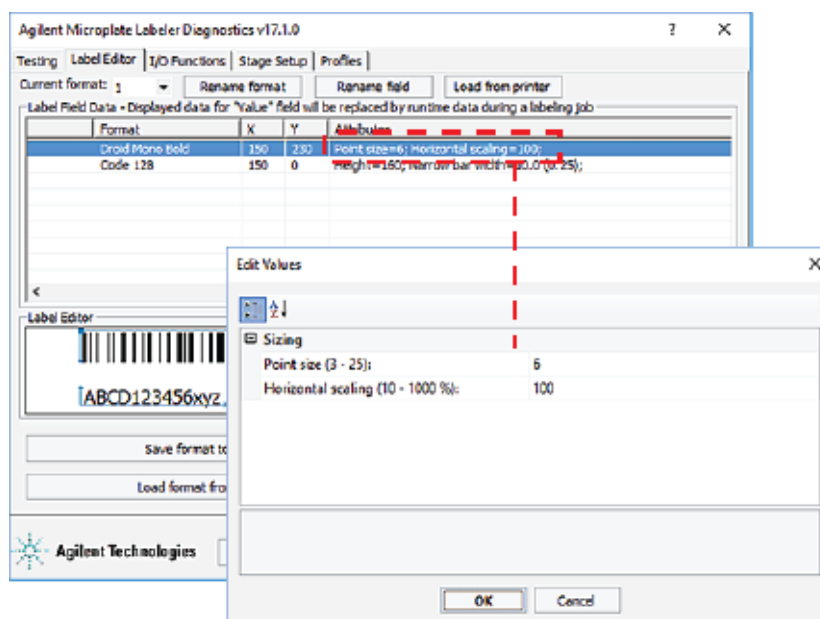
IMPORTANT

If you increase the field size too much, the printed field may not fit on the label. If you decrease the field size too much, the printed field may not be readable. For example, barcode symbology that is too small may appear as a thin line of dots and dashes.

Changing the size attributes of a text field

To change the size attributes of a text field:

- 1 In the **Label Field Data** table, click the entry in the **Attributes** column for the field that you want to edit. The row is highlighted.
- 2 Click the attribute entry once more. The Edit Values dialog box opens.



- 3 In the **Edit Values** dialog box, type the values for the relevant parameters in the **Sizing** area, and then click **OK**.

The available parameters change depending on the format selection.

Font type	Parameter and description
Bitmap fonts: 12x12, 16x16, 16x32, OCR-A, OCR-B	<ul style="list-style-type: none"> • <i>Horizontal magnification</i>. Specifies the x-axis magnification of the text block. • <i>Vertical magnification</i>. Specifies the y-axis magnification of the text block. <p>Range: 1–10</p> <p>The magnification factors are multipliers, for example, a value of 2 is twice as big as 1.</p> <p>The different bitmap fonts are different sizes at a magnification of 1. Therefore, the reasonable range of magnification values varies for each of the bitmap fonts.</p>

5 Creating label formats

Changing the field size and other attributes

Font type	Parameter and description
Vector fonts: Droid Mono, Droid Mono Bold, Swiss721, Swiss721Bold, Monospaced	<ul style="list-style-type: none"> <i>Point size.</i> Specifies the height of the font in 0.01 in (0.0254 mm). For example, a 6-point font will be 0.06-in (0.15 cm) tall. The width is scaled to match. <i>Horizontal scaling (%).</i> Allows you to make the font narrower or wider without changing the font height.

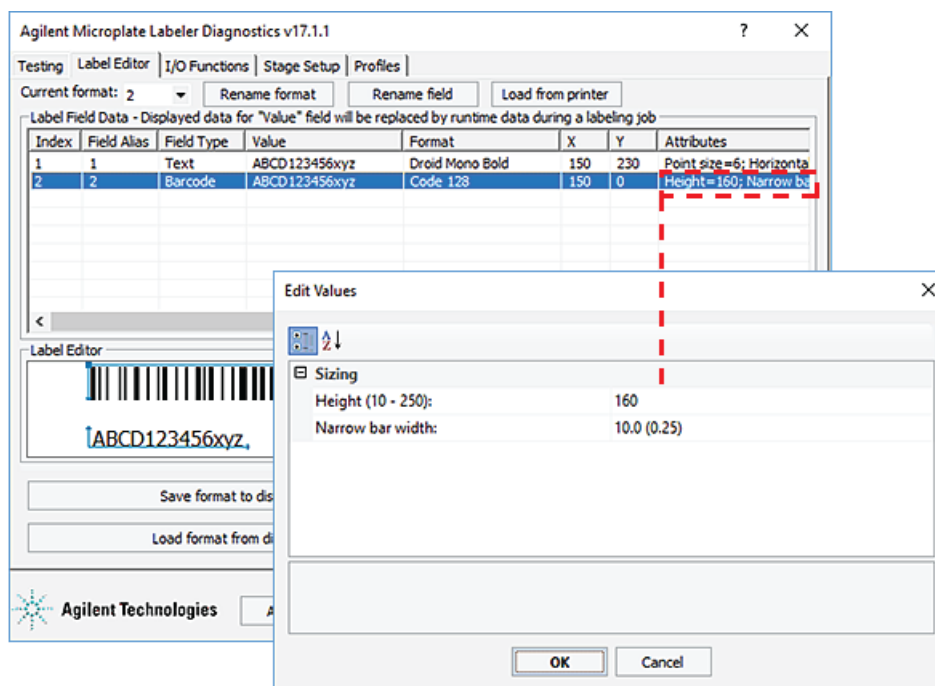
Note: The Label Editor preview box does not reflect the size change. To see the effect, print a test label.

- To check your changes, see “Checking the attribute changes” on page 95.

Changing the attributes of a barcode field

To change the attributes of a barcode field:

- In the **Label Field Data** table, click the entry in the **Attributes** column for the field that you want to edit. The row is highlighted.
- Click the attribute entry once more. The Edit Values dialog box opens.



- In the **Edit Values** dialog box, type or select the values for the relevant parameters, and then click **OK**.

IMPORTANT

Make sure the barcode size allows for sufficient blank margins (quiet zones) on each end of the barcode to ensure readability by a barcode reader.

Parameter	Description
Sizing	Use the sizing parameters to change the barcode size.

Parameter	Description
• Height	Specifies the height of each bar in 0.001 in (0.0254 mm). The overall barcode width is scaled relative to this value. For example, if Height = 150, the barcode is 0.150-in (0.38-cm) tall.
• Narrow bar width	Defines the width of the narrowest bar in the barcode in 0.001 in (0.0254 mm). The overall barcode width is scaled relative to this value.
• Bar width ratio	Defines the ratio between the narrow and wide bars in the barcode. For example, a ratio of 3 means that the wide bar is three times the width of the narrow bar.
• Row height	Defines the height of a single row in a 2D symbology.
• Symbol aspect ratio	Defines the ratio between the height and width of the barcode.
• Dot size	<i>Data Matrix only.</i> Defines the size of the dot in the 2D code. The overall height and width of the barcode are scaled to this value.
• Columns	<i>Micro PDF417 only.</i> Defines how many columns are used (1-4) to display the data. The column number combined with the narrow bar width sets the width of the symbol. The printer adds more rows of data (height to the symbol) as more characters are added.
Error level	<i>PDF417 only.</i> Defines an error level.

- 4 Click **Upload format to printer**, and then check your changes using the following procedure.

IMPORTANT

Verify that your barcode reader can read the barcode in the label format before doing a production run.

Checking the attribute changes

To check the attribute changes:

- 1 In the **Label Editor** tab, click **Print test label**, or press the green button on the device.
If after increasing the size of the field, the field does not print, check where the field is positioned on the label. The field may now be positioned off the edge of the label.

IMPORTANT

The printer does not always scale barcodes and fonts consistently. If you change a text field's magnification, always perform a test print to make sure that you can still read the text. If you change a barcode field's magnification, perform a test read of the barcode using a barcode reader.

Saving the changes

You must upload the changed format to the printer before the revised or new label format is available for printing.

5 Creating label formats

Removing unwanted label format data

To upload the format changes to the printer:

- 1 In the **Label Editor** tab, click **Upload format to printer**.

To save the format changes to an XML file:

- 1 In the **Label Editor** tab, click **Save format to disk**.
- 2 In the **Save As** dialog box, specify the file name and the file storage location, and click **Save**.

Related topics

For information about...	See...
Designing label formats	"Creating and editing label formats" on page 84
Performing a test print and apply operation	"Performing a print-and-apply test" on page 106
Performing a test barcode read	Documentation for your barcode reader
Setting the parameters for the label content	VWorks Automation Control User Guide

Removing unwanted label format data

About this topic

This topic describes how to delete one or more fields from a label format or clear the label format entirely.

Before you start

If you have not already done so, complete the following steps:

Step	Task	See...
1	Open Microplate Labeler Diagnostics.	"Opening Diagnostics" on page 62
2	Ensure the profile for your device is initialized.	"Initializing the device in diagnostics" on page 66
3	In the Label Editor tab, load the label format that you want to modify.	"Loading a label format in the Label Editor" on page 85

Deleting a field

To delete a field:

- 1 In the **Label Editor** tab, right-click the field in the **Label Editor** preview box.
- 2 In the shortcut menu that appears, choose **Delete field**.

Clearing a label

To clear a label of its contents:

- 1 In the **Label Editor** tab, right-click in the **Label Editor** preview box.
- 2 In the shortcut menu that appears, choose **Clear label**.

All of the data in the Label Editor tab disappears.

Related topics

For information about...

Opening Microplate Labeler
Diagnostics

Designing label formats

See...

["Opening Diagnostics" on page 62](#)

["Creating and editing label formats" on page 84](#)

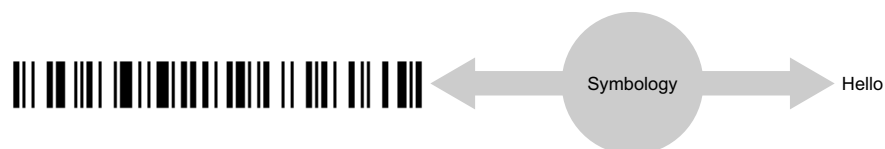
Barcodes and supported symbologies

About this topic

This topic presents basic barcode concepts and provides examples of the supported symbologies.

Symbologies

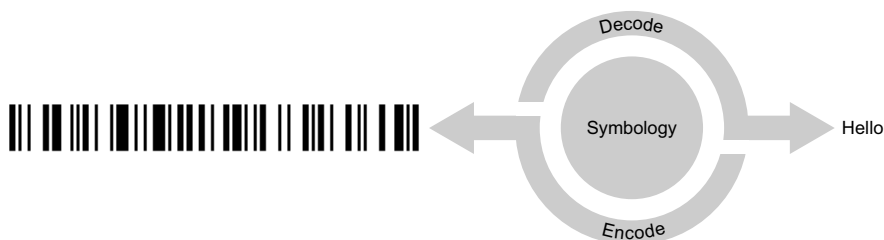
Barcode *symbologies* define the mapping between a barcode and the text that it represents. There are more than 50 barcode symbologies. Barcode symbologies that are typically used in labs are those that create compact barcodes, such as Code 128, Code 39, and Interleaved 2 of 5. The Microplate Labeler also supports printing of 2D barcode symbologies. For examples of the symbologies that are supported by the Microplate Labeler printer, see ["Supported barcode symbologies" on page 99](#).



Encoding and decoding

The printer includes encoding software that converts the text that you provide in a field into a barcode pattern.

If your Microplate Labeler has a barcode reader, the decoder software in the reader converts the pattern of a barcode back into text.



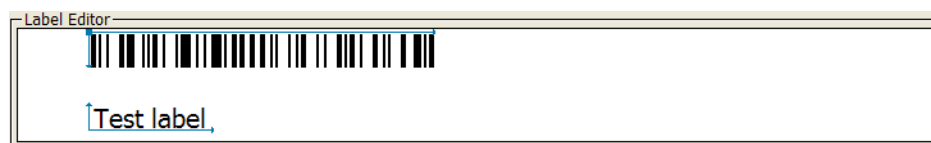
Encoding examples

The following example shows how a label will print when the word *Test* is represented in two types of fields:

- Field 1 as human-readable text
- Field 2 as a barcode that uses the Code 128 symbology



The next example uses the same symbology, but the words *Test label* are used for both fields. Notice that the barcode is longer because the amount of text encoded is greater.












In the following example, the words *Test label* are printed as a text field and as a barcode field using the Code 39 symbology. If you compare this with the previous example, you can see that the different symbology makes a different barcode pattern.



The two-dimensional (2D) barcodes can contain more information than conventional linear barcodes because they encode data in both horizontal and vertical directions.

Supported barcode symbologies

The following table provides a summary of the symbologies supported on the Microplate Labeler. You can find complete descriptions of the symbologies on the web at various sites, for example, www.wikipedia.org.

Symbology name	Summary description
Code 128 	Variable-length, high-density, symbology that can encode all 128 ASCII characters. Has 106 different bar and space patterns and each pattern can have one of three different meanings, depending on which of three different character sets is employed.
Codabar 	Variable-length, can encode the characters: 0123456789-\$.:/+ABCD
Code 39 Full ASCII 	Variable-length symbology that can encode the complete 128 ASCII character set.
Code 93 	Variable-length symbology that can encode the complete 128 ASCII character set.
HIBC 	Variable-length, modified version of Code 39. Health industry barcode (HIBC)
Interleaved 2 of 5 	High-density variable-length, numeric-only (0–9) symbology that encodes numbers in pairs in an interleaved manner.
PDF417 	High-density 2D symbology that essentially consists of a stacked set of smaller barcodes.
MicroPDF417 	A 2D multi-row symbology based on PDF417, designed for applications requiring a greater area efficiency but lower data capacity than PDF417.
Data Matrix 	High-density 2D matrix-style symbology that can encode up to 3116 characters from the entire 256-byte ASCII character set.

Related topics

For information about...	See...
Customizing a label format template	"Creating and editing label formats" on page 84
Label format and content	"About label formats and content" on page 80
Setting up a VWorks labeling protocol	VWorks Automation Control User Guide , Print and Apply Task topic

6+ Maintenance and troubleshooting

This chapter provides maintenance and troubleshooting information for the Microplate Labeler.

The topics are:

- [“Routine maintenance” on page 102](#)
- [“Checking the basic applicator functions” on page 104](#)
- [“Performing a print-and-apply test” on page 106](#)
- [“Using plate stage controls in Diagnostics” on page 109](#)
- [“Testing the barcode reader using Diagnostics” on page 112](#)
- [“Cleaning the device exterior” on page 113](#)
- [“Cleaning the printer components” on page 115](#)
- [“Resetting the label counter in the Diagnostics software” on page 117](#)
- [“Adjusting the feed path of the ribbon” on page 119](#)
- [“Cleaning and replacing the vacuum pads” on page 120](#)
- [“Disconnecting the air tubing” on page 123](#)
- [“Replacing the fuse” on page 124](#)
- [“Troubleshooting hardware problems” on page 126](#)
- [“Resolving error messages” on page 130](#)
- [“Using the cab SQUIX printer touchscreen” on page 133](#)
- [“Using the cab A2+ printer display and navigator pad” on page 135](#)
- [“Reporting problems” on page 137](#)

Routine maintenance

About this topic

Preventive maintenance is an important part of keeping the Microplate Labeler running smoothly and error free. This topic describes the periodic routine maintenance you should perform.

Contact Agilent Automation Solutions Technical Support if you are unable to resolve problems.

Routine inspection and maintenance

Your maintenance schedule can vary depending on the frequency of Microplate Labeler use. In general, you should perform routine maintenance tasks when you replace the printer ribbon and labels.

Maintenance task	Schedule	See...
Check the air-pressure level at the Microplate Labeler. <i>Symptom.</i> Insufficient air pressure or problems picking and placing the labels.	Daily	"Checking the basic applicator functions" on page 104
Clean the Microplate Labeler. <i>Symptom.</i> Dust, grime, or chemical deposits on exterior.	When replacing printer media	"Cleaning the device exterior" on page 113
Clean the print roller. <i>Symptom.</i> Impairment of label advancement or degradation of print quality.	When replacing printer media	"Cleaning the printer components" on page 115
Clean the printhead. <i>Symptom.</i> Degradation of print quality, contrast, or vertical stripes.	When replacing printer media	"Cleaning the printer components" on page 115
Clean the applicator head. <i>Symptom.</i> Dust and grime on applicator head.	When replacing printer media	"Cleaning the device exterior" on page 113
Clean and inspect the vacuum pads. <i>Symptom.</i> Problems picking up labels from the printer or placing labels on labware.	Every three months	"Cleaning and replacing the vacuum pads" on page 120
Replace the vacuum pads. <i>Symptom.</i> Cracked or worn pads.	Annually	"Cleaning and replacing the vacuum pads" on page 120

Maintenance task	Schedule	See...
Replace the labels and thermal transfer ribbon. <i>Symptom.</i> End of media rolls.	As required	"Loading labels and ribbon" on page 44

Related topics

For information about...	See...
Hardware overview	"Hardware overview" on page 12
Safety	"Safety guidelines" on page 1
Troubleshooting hardware problems	"Troubleshooting hardware problems" on page 126
Resolving error messages	"Resolving error messages" on page 130
Reporting problems	"Reporting problems" on page 137

Checking the basic applicator functions

About this topic

This topic describes how to use Microplate Labeler Diagnostics to verify the performance of basic applicator functions. You can perform this procedure at any time to double-check the applicator functions or to help troubleshoot problems.

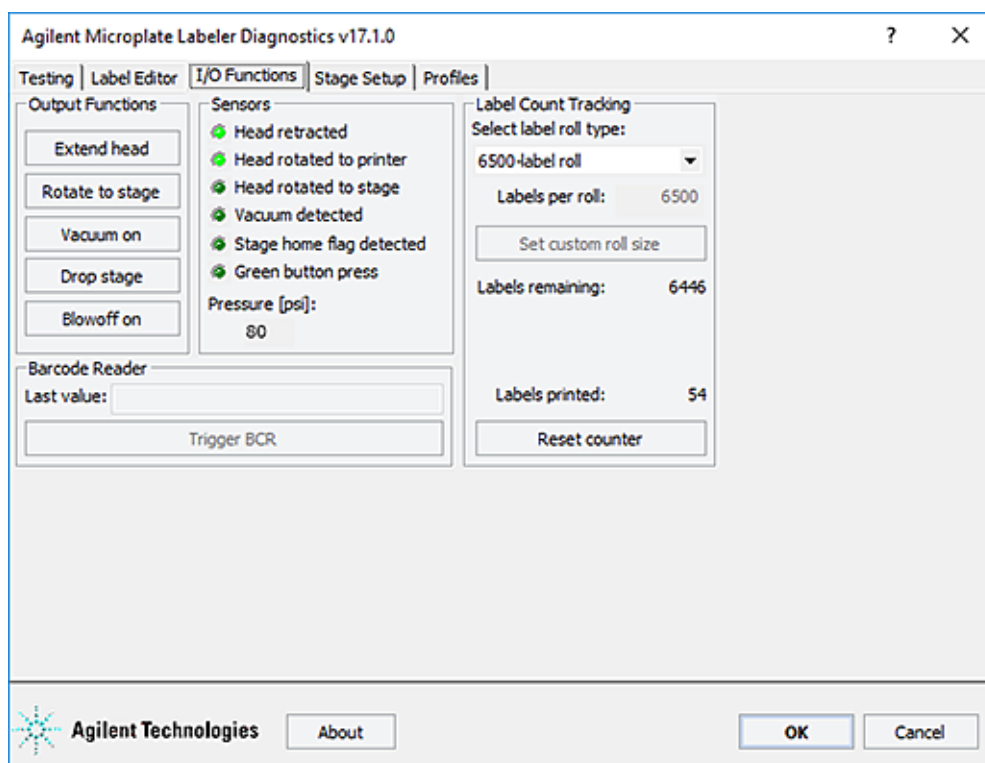
Before you start

The following procedure assumes that:

- Microplate Labeler Diagnostics is open. For details, see [“Opening Diagnostics” on page 62](#).
- The profile for your device is initialized. For details, see [“Initializing the device in diagnostics” on page 66](#).

Procedure

You can use the I/O Functions tab in Microplate Labeler Diagnostics to test basic applicator functions.



To test basic applicator functions:

- 1 In the **Microplate Labeler Diagnostics** window, click the **I/O Functions** tab.
- 2 Under **Output Functions**, click a toggle button to perform the corresponding task and verify that the corresponding indicator lights in the **Sensors** area.
Click the toggle button again to return to the original position.

CAUTION

Before rotating the head, make sure that it is retracted and that a short side of plate stage is facing you as you stand in front of the device. Otherwise, the applicator head will hit the plate stage.

Button	Description
Extend head/Retract head	Extends or retracts the applicator head. In the Sensors area, the Head retracted light turns on when the applicator head is retracted.
Rotate to stage/ Rotate to printer	The applicator head rotates to the plate stage or the printer. In the Sensors area, the Head rotated to printer or the Head rotated to stage light turns on to indicate the current position of the applicator head.
Vacuum on/Vacuum off	Turns on or off the vacuum for the vacuum pads on the applicator head. If the vacuum is turned off when a label is attached to the vacuum pads, the label can drop. If the vacuum pads are pressed against a surface, such as a label, while the vacuum is on, the Vacuum detected light turns on.
Drop stage/Raise stage	Raises or lowers the plate stage.
Blowoff on/Blowoff off	Starts or stops a stream of air through the vacuum pads on the applicator head. If the air flow is on when a label is attached to the vacuum pads, the label is pushed off.

- 3 While observing the **Green button press** indicator in the **Sensors area**, press and hold the green button on top of the device. The Green button press light should turn on.
Note: If a print job has been created, pressing the green button will start the labeling operation.
- 4 Under **Pressure (psi)**, verify that the air pressure readout is correct: 80 psi (0.55 MPa), minimum.
 - *If the readout is <80 psi.* Verify that the air source is supplying 80 psi (0.55 MPa), minimum. If the source is above 80 psi and the readout is below 80 psi, use the pressure regulator knob on the back of the applicator to increase the pressure.
 - *If the readout is >87 psi.* Use the pressure regulator knob on the back of the applicator to lower the pressure to 85 psi (0.58 MPa), maximum.

Related topics

For information about...	See...
Resetting the air pressure	"Setting the air pressure" on page 38
Rotating the plate stage	"Using plate stage controls in Diagnostics" on page 109
Plate stage and applicator head	"About plate stage and applicator head positions" on page 69
Raising or lowering the plate stage	"Setting the plate stage vertical positions" on page 72
Microplate Labeler Diagnostics controls and indicators	"Quick reference to Diagnostics software" on page 139
Troubleshooting problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Performing a print-and-apply test

About this topic

This topic describes how to perform a print and apply test using the Testing tab in Microplate Labeler Diagnostics.

When to do a test print

Perform a print-and-apply test when first setting up your Microplate Labeler, after creating a new label format, when loading new labels and ribbon, or when troubleshooting printing problems.

Testing helps you detect problems such as:

- Incorrect height settings for the plate stage
- Incorrectly loaded label or ribbon
- Poorly designed label formats, for example, overlapping fields, barcodes that are too large for the label, missing barcodes, or text fields that are too small to read

Before you begin

The following procedure assumes that:

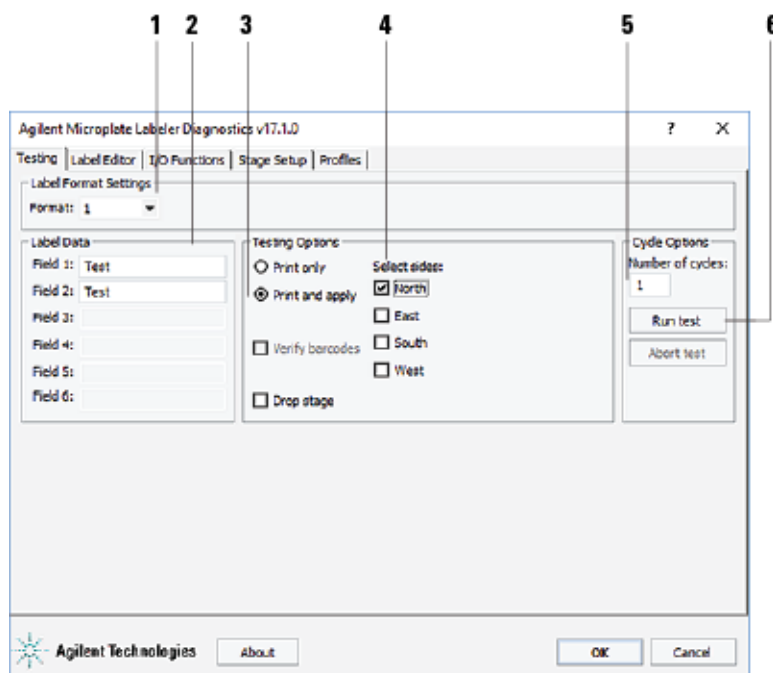
- Microplate Labeler Diagnostics is open. For details, see ["Opening Diagnostics" on page 62](#).
- The profile for your device is initialized. For details, see ["Initializing the device in diagnostics" on page 66](#).

IMPORTANT

Field data entered in the Testing tab of Microplate Labeler Diagnostics is stored temporarily in the computer and not the printer, so it can be used for testing purposes only.

Procedure

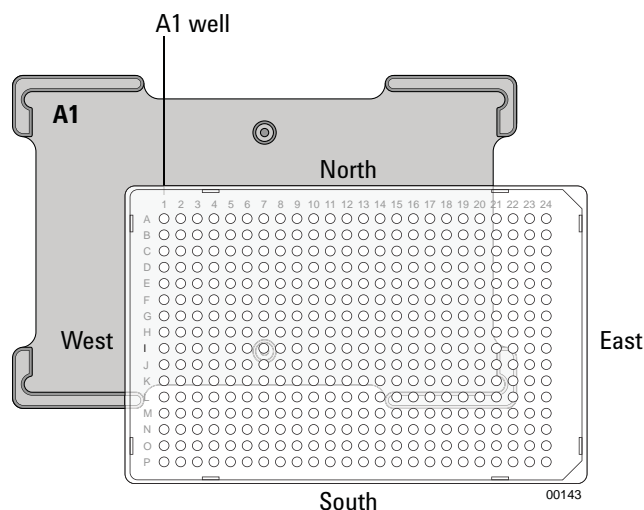
To print a label from the Testing tab:



- 1 In the **Testing** tab, verify that the label format you want to use for this test is selected in the **Format** list.
Note: You can display a preview of the label format in the Label Editor tab.
- 2 Under **Label Data**, type the text in the field box for the position that you want to test.
Note: Only the fields that are defined in the label format can be edited. Fields that are defined in the label format as barcode fields will be encoded into a barcode before printing.
- 3 In the **Testing Options** area, select **Print and apply**.
- 4 Select the compass points corresponding to one or more sides that you want to apply labels to, for example **North** and **West**.

6 Maintenance and troubleshooting

Performing a print-and-apply test



IMPORTANT

Make sure that the height of the plate stage is suitable for the type of microplate being labeled, and that there is a microplate on the plate stage.

- 5 In the **Number of cycles** list, set the value to the number of microplates that you want to test label.
- 6 Click **Run test** or press the green button on the top of the device.
The first label is printed and applied to the microplate.
- 7 If you are test labeling multiple microplates, quickly replace the microplate on the plate stage with a new one.
Repeat this step until all the test cycles are completed.

Related topics

For information about...	See...
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Placing a microplate	"Placing a microplate on the plate stage" on page 68
Adjusting the height of the plate stage	"Setting the plate stage vertical positions" on page 72
The overall process of designing a label format	"Creating and editing label formats" on page 84
Running a labeling protocol	VWorks Automation Control User Guide
Microplate Labeler Diagnostics controls and indicators	"Quick reference to Diagnostics software" on page 139
Troubleshooting problems	"Troubleshooting hardware problems" on page 126

Using plate stage controls in Diagnostics

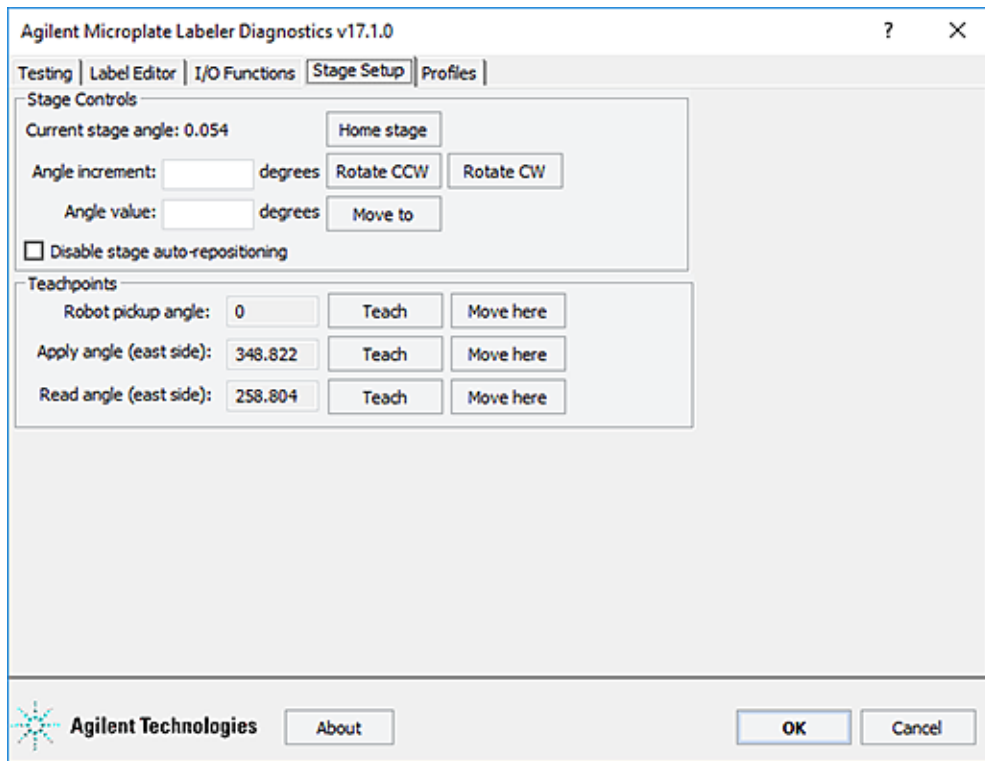
About this topic

The plate stage controls in Microplate Labeler Diagnostics are useful when setting up the Microplate Labeler, troubleshooting, or performing maintenance on the Microplate Labeler.

This topic describes how to use the Stage Setup tab to perform the following procedures:

- “Enabling and disabling plate stage auto-repositioning” on page 110
- “Rotating the plate stage using stage controls” on page 110
- “Moving the plate stage to a teachpoint” on page 111

Figure Stage Setup tab in Microplate Labeler Diagnostics



Before you begin

CAUTION

Before moving the plate stage, make sure that the applicator head is not in the rotation path of the plate stage.

The following procedure assumes that:

- Microplate Labeler Diagnostics is open. For details, see “Opening Diagnostics” on page 62.

- The profile for your device is initialized. For details, see [“Initializing the device in diagnostics” on page 66](#).

Enabling and disabling plate stage auto-repositioning

By default, plate stage auto-repositioning is enabled. If the plate stage is moved from a position by an outside force (for example, if someone rotates the stage by hand), the auto-repositioning feature automatically moves the plate stage back to the last angle.

When setting up the device, troubleshooting, or performing maintenance on the Microplate Labeler, you can disable the auto-repositioning feature.

To disable plate stage auto-repositioning:

- 1 In the **Stage Setup** tab under **Stage Controls**, select the **Disable stage auto-repositioning** check box.

When auto-repositioning is disabled, any disturbances that cause the plate stage to rotate will not be corrected until another move is commanded.

To enable plate stage auto-repositioning:

- 1 In the **Stage Setup** tab under **Stage Controls**, clear the **Disable stage auto-repositioning** check box.

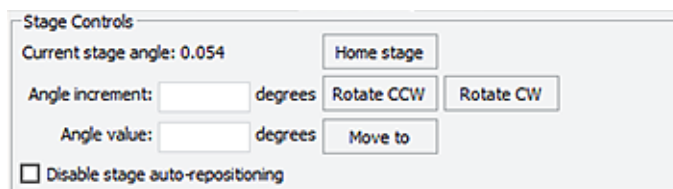
Rotating the plate stage using stage controls

To rotate the plate stage:

- 1 Ensure that the applicator head is pointing towards the printer.
If the applicator head is pointing towards the plate stage:
 - a In **Microplate Labeler Diagnostics**, click the **I/O Functions** tab.
 - b Click **Rotate to printer**.

The applicator head rotates towards the printer, moving it out of the plate stage rotation path.

- 2 Move the plate stage in one of the following ways:



- *To move relative to the current position.* Under **Stage Controls**, type a value in the **Angle increment** box, and then click **Rotate CCW** (counterclockwise) or **Rotate CW** (clockwise).
- *To move to a specific angle.* Type a value in the **Angle value** box, and then click **Move to**.
- *To rehome the plate stage.* Click **Home stage**.

Moving the plate stage to a teachpoint

- 1 Ensure that the applicator head is pointing towards the printer.
If the applicator head is pointing towards the plate stage:
 - a In **Microplate Labeler Diagnostics**, click the **I/O Functions** tab.
 - b Click **Rotate to printer**.
The applicator head rotates towards the printer, moving it out of the plate stage rotation path.
- 2 Click the **Stage setup** tab.
- 3 Make sure that **Disable stage auto-repositioning** is not selected.
- 4 Click **Move here** on the same row as the teachpoint to which you want to move.
The plate stage moves to the position.

Related topics

For information about...	See...
Plate stage and head positions	"About plate stage and applicator head positions" on page 69
Changing the robot pickup angle	"Setting the robot pickup angle teachpoint" on page 76
Microplate Labeler Diagnostics controls and indicators	"Quick reference to Diagnostics software" on page 139
Troubleshooting problems	"Troubleshooting hardware problems" on page 126

Testing the barcode reader using Diagnostics

About this topic

If you have installed the optional barcode reader on the Microplate Labeler, you can use the following procedure to test the reader.

Before you begin

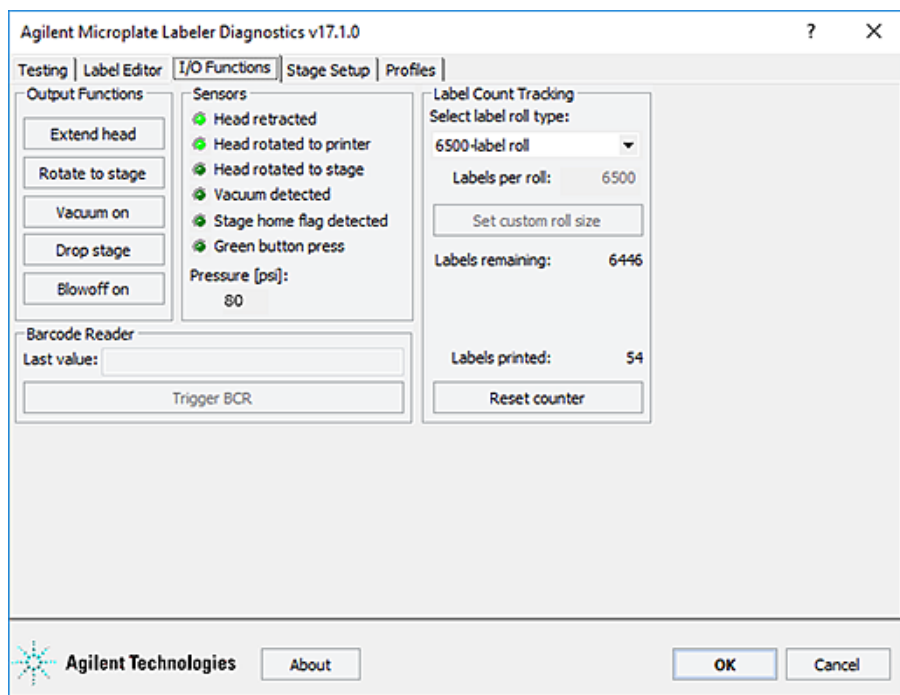
The following procedure assumes that:

- Microplate Labeler Diagnostics is open. For details, see [“Opening Diagnostics” on page 62](#).
- The profile for your device is initialized. For details, see [“Initializing the device in diagnostics” on page 66](#).

Procedure

To test the barcode reader using Microplate Labeler Diagnostics:

- 1 In the **I/O Functions** tab, under **Barcode Reader**, click **Trigger BCR**.



Note: If the button is unavailable, either the barcode reader was not detected during initialization, the Microplate Labeler was not previously initialized, or a microplate with a barcode label was on the plate stage during initialization.

- 2 In the **Last value** box, check the displayed result.

If you receive an error, make sure that the barcode reader's laser lines are aligned with the label. For assistance, contact the Agilent Automation Solutions Technical Support.

- 3 Move the plate stage so that another side of the microplate is exposed to the reader, and repeat the test.

Read angle information

The read angle is the position of the plate stage when a label is being read. This angle was set at the factory and should not require adjustment. You can view the setting for Read angle (east) teachpoint in the Stage Setup tab. This teachpoint specifies the angle to which the plate stage rotates so that the east side faces the optional barcode reader. To move the plate stage so that each of the other sides face the barcode reader, the software uses angles 90-, 180-, and 270-degrees from the teachpoint.

If barcodes cannot be read on all four sides of the microplate the read angle is not optimal. Contact the Agilent Automation Solutions Technical Support for assistance.

Related topics

For information about...	See...
Microplate Labeler Diagnostics controls and indicators	"Quick reference to Diagnostics software" on page 139
Troubleshooting problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Cleaning the device exterior

About this topic

This topic provides guidelines for periodic routine cleaning of the Microplate Labeler applicator to remove dust, grime, or chemical deposits on the exterior.

Before you begin

WARNING

To avoid risk of electric shock, turn off the Microplate Labeler and disconnect the power cord before performing any maintenance or cleaning.

CAUTION

Do not use harsh abrasives, corrosive cleaning agents, or metal brushes to clean any Microplate Labeler component or accessory. The printer can be damaged by aggressive cleansers. Do not use abrasive cleaners, ethanol, or other solvents for cleaning the external surfaces or modules of the printer.

Ensure that you have the following:

- Standard laboratory wipes
- Mild soap-and-water solution

- Soft brush or vacuum cleaner

Procedure

To clean the Microplate Labeler:

- 1** If you have not already done so, shut down the Microplate Labeler and disconnect the power cord.
- 2** Clean the printer exterior as follows:
 - a** Use standard laboratory wipes and a mild soap-and-water solution to clean the printer cover.
 - b** Remove dust and paper fluff from the print area with a soft brush or vacuum cleaner.
- 3** To clean the painted white surfaces and the aluminum surfaces of the device, use standard laboratory wipes and a mild soap-and-water solution.

Related topics

For information about...	See...
Shutting down the Microplate Labeler	"Starting up and shutting down" on page 54.
Hardware overview	"Hardware overview" on page 12
Troubleshooting hardware problems	"Troubleshooting hardware problems" on page 126
Cleaning the printhead and print roller	"Cleaning the printer components" on page 115
Cleaning the applicator head vacuum pads	"Cleaning and replacing the vacuum pads" on page 120
Reporting problems	"Reporting problems" on page 137

Cleaning the printer components

About this topic

This topic describes how to clean the following Microplate Labeler printer components:

- *Print roller.* Accumulations of dirt on the print roller can impair the forward movement of the labels and ribbon and the impair the print quality.
- *Printhead.* Substances can accumulate on the printhead leading to degradation of print quality.

Note: If the Microplate Labeler is fitted with a cab SQUIX printer, go to the printer touchscreen Help menu to view a video of how to clean the printhead.

When to do this

Clean the printhead and print roller when you replace the rolls of ribbon and labels. Cleaning the printhead regularly helps to ensure a consistently good printed image and prevents premature wear of the printhead.

If the printer components appear damaged, contact Agilent Automation Solutions Technical Support.

Before you begin

Remove the labels and ribbon before you attempt to clean the printer components. For details, see [“Loading labels and ribbon” on page 44](#).

WARNING

To avoid risk of electric shock, turn off the Microplate Labeler and disconnect the power cord before performing any maintenance or cleaning.

WARNING

The printhead is hot after use. To avoid risk of injury, ensure the printhead has cooled down before cleaning.

CAUTION

To avoid damage to the printhead, do not use sharp or hard objects to clean printhead. Do not touch the protective glass layer of printhead with your fingers.

Ensure that you have the following:

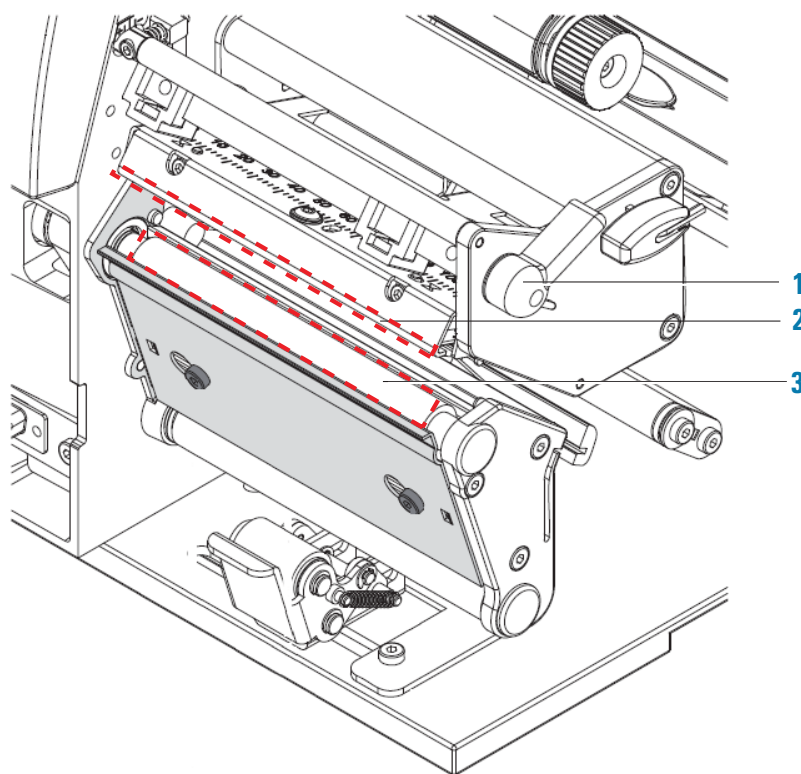
- Isopropyl alcohol and soft cloth to clean the print roller
- Cleaning pen from the Media Kit to clean the printhead

Alternatively, you can use a cotton swab dipped in isopropyl alcohol.

Procedure

The following figure shows the locations of the printer components referenced in this procedure.

Figure Printhead and print roller locations



To clean the printer components:

- 1 Ensure the printhead lever (1) is turned counterclockwise lifting the printhead (2).
- 2 Use the special cleaning pen to clean the printhead surface (2). The printhead is the narrow bar that presses the image through the ribbon and onto the label as the media move into position on the print roller.
Alternatively, if you do not have the cleaning pen, use a cotton swab dipped in isopropyl alcohol.
- 3 Use isopropyl alcohol and a soft cloth to remove any deposits from the print roller (3).

IMPORTANT

Allow the printhead to dry for 2–3 minutes before using the printer.

Related topics

For information about...

Shutting down the Microplate Labeler

Removing and installing the labels and ribbon in the printer

Resetting the label counter

See...

["Starting up and shutting down" on page 54.](#)

["Loading labels and ribbon" on page 44](#)

["Resetting the label counter in the Diagnostics software" on page 117](#)

For information about...	See...
Cleaning the Microplate Labeler exterior	"Cleaning the device exterior" on page 113
Cleaning the applicator head vacuum pads	"Cleaning and replacing the vacuum pads" on page 120
Troubleshooting hardware problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Resetting the label counter in the Diagnostics software

About this topic

When you load a new roll of labels in the Microplate Labeler printer, you can reset the label counter Microplate Labeler Diagnostics to help you track the number of labels you use.

Before you begin

The following procedure assumes that:

- Microplate Labeler Diagnostics is open. For details, see ["Opening Diagnostics" on page 62](#).
- The profile for your device is initialized. For details, see ["Initializing the device in diagnostics" on page 66](#).

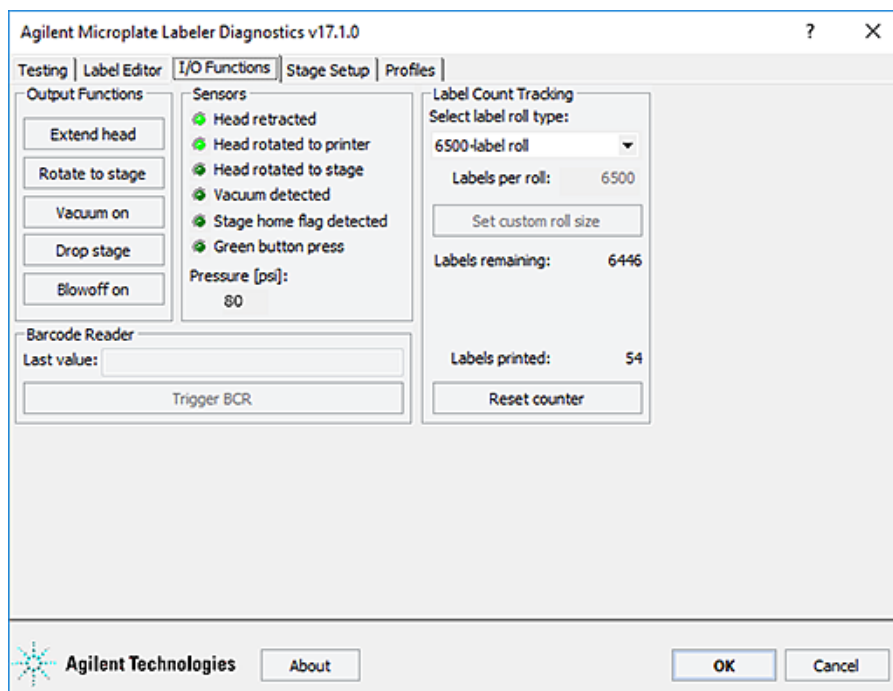
Procedure

To reset the label counter:

- 1 In **Microplate Labeler Diagnostics**, click the **I/O Functions** tab.

6 Maintenance and troubleshooting

Resetting the label counter in the Diagnostics software



- 2 Under **Label Count Tracking**, click **Reset counter**.
- 3 In the **Select label roll type** list, select the size of the roll.
If you selected the Custom roll size, proceed to [step 4](#).
- 4 Type the number of labels in the **Labels per roll** box, and then click **Set custom roll size**.

Related topics

For information about...	See...
Loading new labels	"Loading labels and ribbon" on page 44
Designing label formats	"Creating and editing label formats" on page 84
Microplate Labeler Diagnostics controls and indicators	"Quick reference to Diagnostics software" on page 139
Performing a print-and-apply test	"Performing a print-and-apply test" on page 106
Troubleshooting problems	"Troubleshooting hardware problems" on page 126

Adjusting the feed path of the ribbon

About this topic

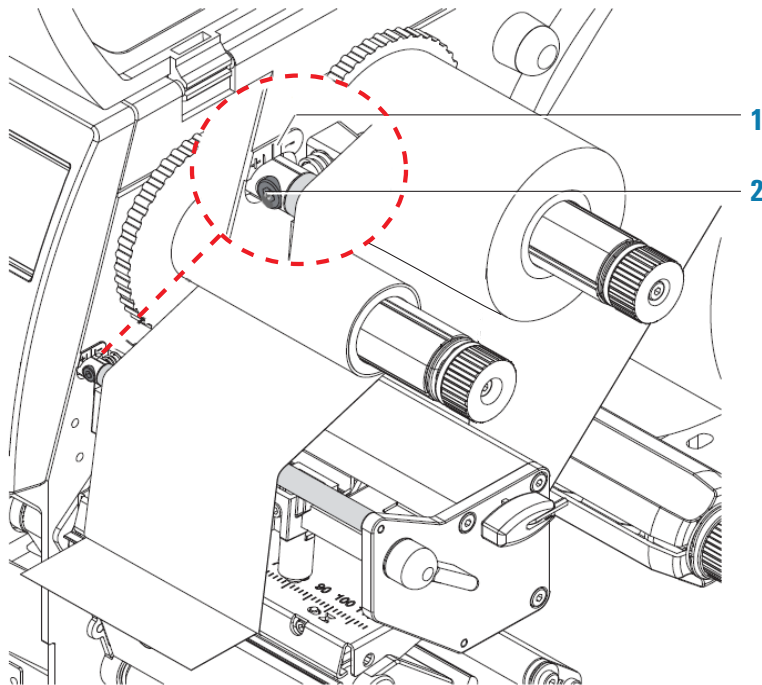
Rarely, ribbon wrinkling can lead to print image errors. This topic describes how to make minor adjustments to the feed path of the ribbon.

Procedure

IMPORTANT

This adjustment should be performed during printing.

Figure Setting the feed path of the ribbon



To set the feed path of the transfer ribbon:

- 1 Read the current setting on the scale (1) and record, if necessary.
- 2 Turn the screw (2) using a hex wrench and observe the behavior of the ribbon.
To tighten the inner edge of the ribbon turn in the + direction. To tighten the outer edge of the ribbon, turn in the - direction.

Related topics

For information about...	See...
Printer components	"Printer overview" on page 15
Removing and installing the labels and ribbon in the printer	"Loading labels and ribbon" on page 44
Cleaning the printer components	"Cleaning the printer components" on page 115
Troubleshooting hardware problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Cleaning and replacing the vacuum pads

About this topic

The applicator head on the Microplate Labeler uses vacuum pads to pick up the printed labels from the printer and place the printed labels on the labware. This topic describes how to clean and, if necessary, replace the vacuum pads.

When to do this procedure

To maintain proper function, the vacuum pads must be clean and undamaged. A sticky residue from the label adhesive can build up on the vacuum pads. You should routinely clean the vacuum pads when you change the printer ribbon and labels.

If the Microplate Labeler is not picking up or placing the labels correctly and the air pressure setting is correct, try cleaning the vacuum pads.

If the vacuum pads are cracked, replace the vacuum pads.

Before you begin

CAUTION

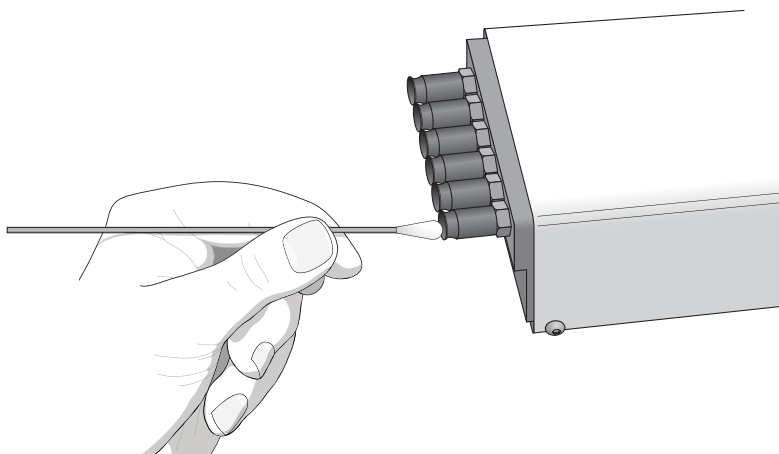
Do not use harsh abrasives, corrosive cleaning agents, or metal brushes to clean any Microplate Labeler component or accessory.

Make sure you have the following items:

- Cotton swabs
- Mild soap and water solution
- Replacement vacuum pads, if required

Cleaning the vacuum pads

Figure Cleaning the vacuum pads on the applicator head



To clean the vacuum pads on the Microplate Labeler applicator head:

- 1 Open **Microplate Labeler Diagnostics**, click the **Profile** tab, and initialize the profile for the device.
- 2 To ensure the plate stage is out of the path of the applicator head:
 - a In the **Stage Setup** tab, select the **Disable stage auto-repositioning** check box.
 - b Gently rotate the plate stage manually so that it is out of the path of the applicator head.
- 3 To ensure that the applicator head is retracted and rotated away from the printer for easier access:
 - a In the **I/O Functions** tab, click **Retract head**.
 - b Click **Rotate to stage**.

- 4 Use soapy water and a cotton swab to wipe the surface of the vacuum pads that contacts the labels. Remove any dust and grease from each pad.

Note: The pads can develop a sticky residue from the label adhesive, which may require more effort to remove.

- 5 Wait for the vacuum pads to dry.
- 6 Run a print-and-apply test to verify that the vacuum pads are functioning properly. For details, see [“Performing a print-and-apply test” on page 106](#).

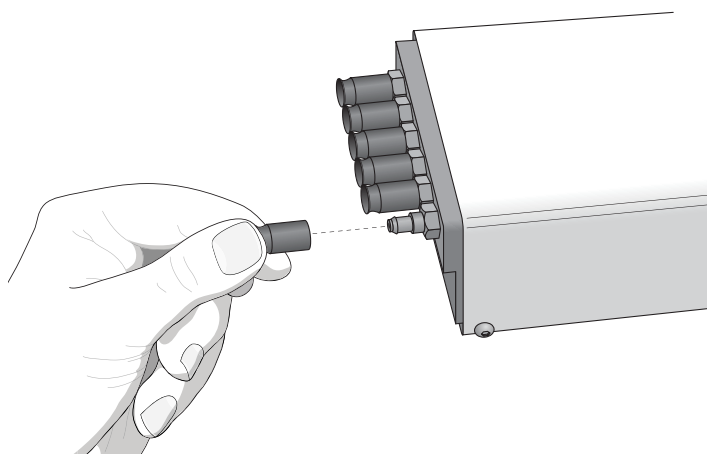
If the vacuum pads are functioning properly, ensure that the applicator head is clear of the path of the plate stage. In the **Stage Setup** tab, clear the **Disable stage auto-repositioning** check box.

If problems persist, replace the vacuum pads using the following procedure or contact Agilent Automation Solutions Technical Support.

Inspecting and replacing the vacuum pads

Before removing the vacuum pads, try cleaning them, and then run a print-and-apply test to see if the problem persists.

Figure Replacing the vacuum pads on the applicator head



To inspect and replace the vacuum pads:

- 1** To gain access to the vacuum pads:
 - a** Ensure that the plate stage is rotated out of the path of the applicator head.
 - b** Rotate the applicator head towards the plate stage.
- 2** Grab the vacuum pad firmly with your fingers, and pull the pad off of the applicator head.
- 3** Roll the vacuum pad between your fingers and look for cracks or splits along the length of the pad.
If a vacuum pad seems worn or has cracks or splits, replace all six vacuum pads.
- 4** Install new vacuum pads by pressing them onto the applicator head with your fingers.

Related topics

For information about...	See...
Shutting down the Microplate Labeler	"Starting up and shutting down" on page 54.
Hardware overview	"Hardware overview" on page 12
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Cleaning the Microplate Labeler exterior	"Cleaning the device exterior" on page 113
Cleaning the printhead and the print roller	"Cleaning the printer components" on page 115
Troubleshooting hardware problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Disconnecting the air tubing

About this topic

This topic explains how to disconnect the air tubing without damaging the air input connector.

Before moving or shipping the Microplate Labeler you must disconnect the air tubing. You may also want to do this before performing maintenance or cleaning the device.

Before you begin

WARNING

To avoid injury, turn off the air supply before disconnecting the air tubing. When air is flowing, air tubing can injure you if it whips around and strikes you. If you have not been trained in the correct way to handle air tubing, contact your facilities department.

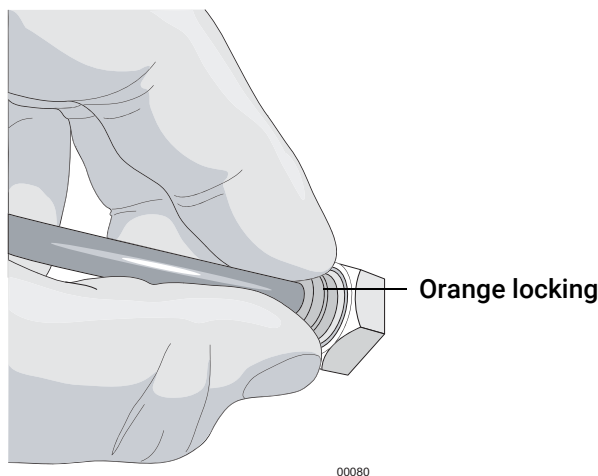
CAUTION

Follow the directions in this topic to correctly disconnect the air tubing from the Microplate Labeler air supply port in order to avoid damage to the device.

Procedure

To disconnect the air tubing:

- 1 Turn off the air source so that there is no air pressure to the Microplate Labeler.
- 2 Push in the orange locking collar on the quick-release fitting.



- 3 With your free hand, gently pull on the air tubing until it comes free.

Related topics

For information about...	See...
Connecting air supply	<ul style="list-style-type: none">• "Connecting the air tubing: non-metric" on page 34• "Connecting the air tubing: metric" on page 36
Troubleshooting hardware problems	"Troubleshooting hardware problems" on page 126
Reporting problems	"Reporting problems" on page 137

Replacing the fuse

About this topic

This topic describes how to replace the main fuse in the Microplate Labeler.

Before you begin

Use only the specified fuse type:

3 A, 0.25 x 1.25 in (6.35 x 31.75 mm), fast acting

You can order replacement fuses from Agilent Technologies.

CAUTION

A blown fuse can indicate more serious problems. If the new fuse blows after replacement, contact Agilent Automation Solutions Technical Support.

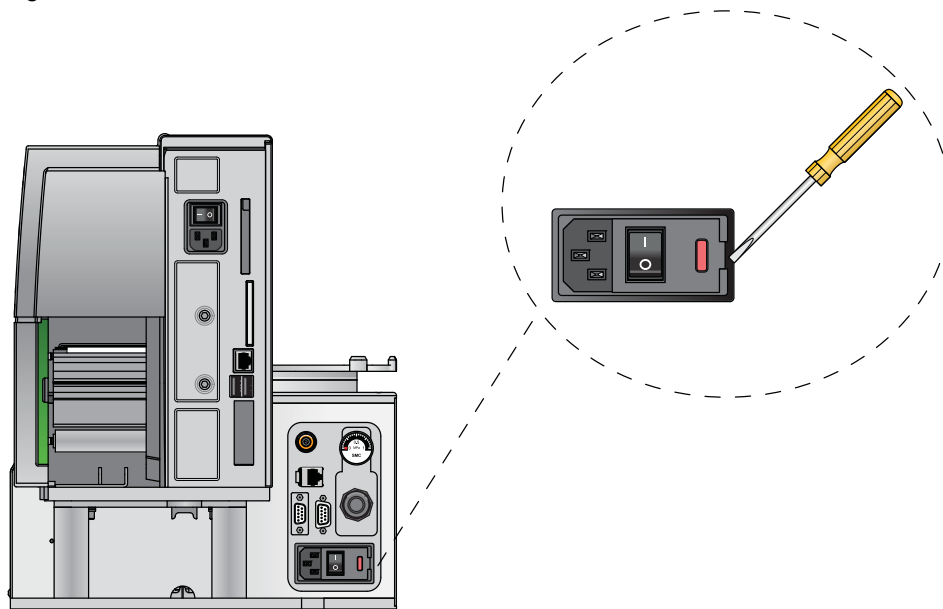
Using an incorrect fuse can damage the Microplate Labeler.

Procedure

To replace the fuse in the power switch:

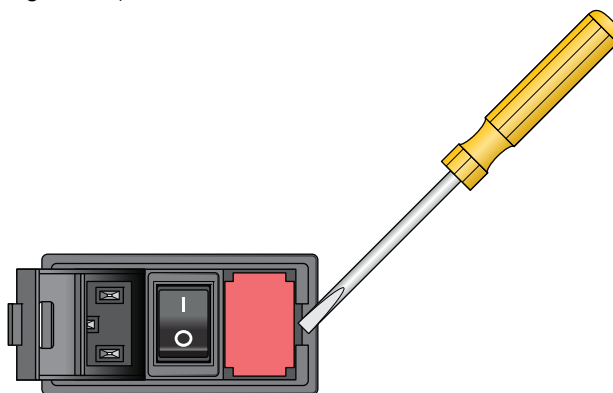
- 1 Shut down the Microplate Labeler, and unplug the power cable from the rear panel connector.
- 2 At the rear panel power switch enclosure, use a small flat-head screwdriver (2.5 mm) to pry open the tab on the enclosure and open the enclosure cover.

Figure Fuse enclosure location



- 3 Slide the fuse cartridge all the way out of the enclosure.

Figure Opened fuse enclosure



- 4 Replace the fuse in the cartridge.
5 Slide the fuse cartridge back into the power switch enclosure.
6 Press the enclosure cover securely into the closed position.
7 Plug in the power cable at the rear panel connector, and then start up the Microplate Labeler.

Related topics

For information about...

Connecting the power cable

Shutting down the Microplate Labeler

See...

"Connecting the power cord" on page 39

"Starting up and shutting down" on page 54

Troubleshooting hardware problems

About this topic

This topic describes some commonly-encountered hardware problems and provides suggestions for how to solve them.

If you encounter a problem, review the following tables first to see if you can solve the problem:

- [“Communications or power problems” on page 126](#)
- [“Air pressure and label pick-and-place problems” on page 128](#)
- [“Printing problems” on page 128](#)

If an error message appears, see [“Resolving error messages” on page 130](#).

If your problem is not listed, or you are not able to resolve the problem, contact Agilent Automation Solutions Technical Support. See [“Reporting problems” on page 137](#).

Communications or power problems

Problem	Possible cause	Possible solution
The Microplate Labeler does not turn on.	The power cord is not connected or is defective.	Ensure that the power cord is connected to the Microplate Labeler connection panel at the rear of the applicator. See “Connecting the power cord” on page 39 . Make sure the power cord is in good condition.
	The fuse is bad.	See “Replacing the fuse” on page 124 . IMPORTANT A blown fuse can indicate other problems. If the fuse blows again, contact Agilent Automation Solutions Technical Support.
The profile failed to initialize the device.	The communications cable is not properly connected, or the wrong cable is being used.	Verify that the correct cable is properly connected. <i>Note:</i> Ethernet is the recommended mode of communication. See “Connecting the device to the computer” on page 41 .
	The printer is not in a Ready state.	The Ready message must appear on the printer’s display before the Microplate Labeler can initialize. If the Ready message does not appear: <ol style="list-style-type: none">1 Open the printer cover, and verify that the printhead lever is down.2 Turn off the power to the Microplate Labeler, wait a full 5 seconds, and then turn on the power.

Problem	Possible cause	Possible solution
Communication is not established with an Ethernet connection.	The communications cable is not properly connected, or the wrong cable is being used.	Verify the computer was connected correctly to the Ethernet port on the Microplate Labeler connection panel (at the back of the applicator). See "Connecting the device to the computer" on page 41 .
	The IP address setting is incorrect.	If you are connecting multiple Microplate Labeler devices on the same network, contact Agilent Automation Solutions Technical Support for guidance on setting the IP addresses. For details on how to connect to the device via Ethernet, see "Connecting the device to the computer" on page 41 .
Communication is not established with a serial connection.	The communications cable is not properly connected, or the wrong cable is being used.	Verify that the computer was connected correctly to the serial port on the Microplate Labeler connection panel (at the back of the applicator). See "Connecting the device to the computer" on page 41 .
	Wrong COM port selected	Verify that the selected profile specifies the correct COM port on the computer. To verify the COM port in the profile: 1 In Microplate Labeler Diagnostics, click the Profiles tab. 2 Select the profile, and verify the selected COM port is correct for your connection. For details on creating or editing profiles, see "Creating a profile" on page 64 .
The printer screen is blank.	The printer was not initialized properly or the power was cycled too quickly.	At the Microplate Labeler connection panel (on the back of the applicator), press the power switch to the off (o) position, wait a full 5 seconds, and then press the power switch to the on (I) position.
	The printer power switch is in the off (o) position.	Ensure that the power switch on the back of the printer remains in the on (I) position at all times.
In Microplate Labeler Diagnostics, the Trigger BCR button and Verify barcodes buttons are unavailable.	The barcode reader was not detected during initialization, or the Microplate Labeler was not initialized.	Make sure the barcode reader is installed properly. For details, contact Agilent Automation Solutions Technical Support.

Air pressure and label pick-and-place problems

Problem	Possible cause	Possible solution
The applicator head does not retract, extend, or rotate on command and you can hear a hissing sound.	An air leak is present.	Inspect the air tubing and check the air connection on the Microplate Labeler connection panel and at the source for leaks. For connection details, see "Connecting the air tubing: non-metric" on page 34 or "Connecting the air tubing: metric" on page 36 .
The applicator head does not extend far enough to reach the labels at the printer, or is retracting too soon.	The air pressure is set incorrectly.	Check the air pressure and adjust the pressure as necessary. See "Checking the basic applicator functions" on page 104 .
	The pneumatics flow control requires adjustment.	Contact Agilent Automation Solutions Technical Support.
Labels are not being picked up from the printer.	The air pressure is set incorrectly.	Check the air pressure and adjust the pressure as necessary. See "Checking the basic applicator functions" on page 104 .
	The vacuum pads are dirty or worn.	See "Cleaning and replacing the vacuum pads" on page 120 .
	The applicator head height or internal pressure settings require adjustment.	Contact Agilent Automation Solutions Technical Support.
A label is "flipped over" when the applicator head is picking it up from the printer.	The vacuum pads are dirty or worn.	Remove the label and clean the vacuum pads. See "Cleaning and replacing the vacuum pads" on page 120 . If the problem persists, contact Agilent Automation Solutions Technical Support.

Printing problems

Problem	Possible cause	Possible solution
The printed image is not clear.	The wrong type of media is installed, or the media is installed incorrectly.	Make sure that you are using the ribbon and labels provided in the Microplate Labeler Media Kit. See "Loading labels and ribbon" on page 44 .
	The transfer ribbon is wrinkled.	See "Adjusting the feed path of the ribbon" on page 119 .

Problem	Possible cause	Possible solution
The print image has smears or blanks, or one side is lighter than the other.	The printhead is dirty.	See "Cleaning the printer components" on page 115.
The labels feed through the printer, but the ribbon does not move.	The ribbon is installed incorrectly.	Make sure that you are using the ribbon and labels provided in the Microplate Labeler Media Kit, and that the media is installed correctly. See "Loading labels and ribbon" on page 44.
The labels are drifting at the peelbar.	Excess media backing up on the take-up reel.	Discard the excess labels and ribbon and re-install labels and ribbon. See "Loading labels and ribbon" on page 44.

Related topics

For information about...	See...
Shutting down the Microplate Labeler	"Starting up and shutting down" on page 54.
Hardware overview	"Hardware overview" on page 12
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Preventive maintenance schedule	"Routine maintenance" on page 102
Resolving error messages	"Resolving error messages" on page 130
Reporting problems	"Reporting problems" on page 137

Resolving error messages

About this topic

This topic describes commonly-encountered error messages for the Microplate Labeler and how to resolve them.

If you encounter a problem, review the following tables first to see if you can solve the problem:

- [“Air pressure messages” on page 130](#)
- [“Applicator head error messages” on page 130](#)
- [“Communication messages” on page 131](#)
- [“Printer error messages” on page 131](#)

If you have a hardware problem, see [“Troubleshooting hardware problems” on page 126](#).

If your problem is not listed, or you are not able to resolve the problem, contact Agilent Automation Solutions Technical Support. See [“Reporting problems” on page 137](#).

Air pressure messages

Error message	Possible cause	Solution
Air pressure is out of range.	The air pressure is too high or too low.	In Microplate Labeler Diagnostics, check the air pressure reading on the I/O Functions tab. See “Checking the basic applicator functions” on page 104 .
An unknown error occurred when reading the air pressure before stage motion.	The air pressure is too high or too low.	In Microplate Labeler Diagnostics, check the air pressure reading on the I/O Functions tab. See “Checking the basic applicator functions” on page 104 .

Applicator head error messages

Error message	Possible cause	Solution
An error occurred when picking the label.	Dirty vacuum pads or worn vacuum pads.	Clean and inspect the vacuum pads. Replace worn vacuum pads. See “Cleaning and replacing the vacuum pads” on page 120 .
	The wrong type of media is installed, or the media is installed incorrectly.	Make sure that you are using the ribbon and labels provided in the Microplate Labeler Media Kit. See “Loading labels and ribbon” on page 44 for installation instructions.

Error message	Possible cause	Solution
An error occurred when extending the head.	The air pressure is too high or too low.	In Microplate Labeler Diagnostics, check the air pressure reading on the I/O Functions tab. See "Checking the basic applicator functions" on page 104.
An error occurred when applying the label.	The plate stage does not contain a microplate.	Ensure that a microplate is on the plate stage and try again.

Communication messages

Error message	Possible cause	Solution
A serial error occurred.	The communications cable is not connected properly, or the wrong cable is being used.	Verify that the computer was connected correctly to the serial port on the Microplate Labeler connection panel (at the back of the applicator). See "Connecting the device to the computer" on page 41.
	The wrong COM port on the computer is specified in the profile.	Verify that the selected profile specifies the correct COM port on the computer. To verify the COM port in the profile: 1 In Microplate Labeler Diagnostics, click the Profiles tab. 2 Select the profile, and verify the selected COM port is correct for your connection. See "Creating a profile" on page 64.
An unknown error has occurred.	An unknown error has occurred.	At the Microplate Labeler connection panel (on the back of the applicator), press the power switch to the off (o) position, wait a full 5 seconds, and then press the power switch to the on (I) position.

Printer error messages

Error message	Possible cause	Solution
An error occurred when adjusting the printer format.	The label format contains errors.	Open Microplate Labeler Diagnostics and check label format. See "Creating and editing label formats" on page 84.

6 Maintenance and troubleshooting

Resolving error messages

Error message	Possible cause	Solution
An error occurred when form feeding the printer.	The wrong type of media is installed, or the media is installed incorrectly.	Make sure that you are using the ribbon and labels provided in the Microplate Labeler Media Kit. See “Loading labels and ribbon” on page 44 for installation instructions.
Either the printer command was malformed or the barcode size settings are too large.	The label format contains errors.	See “Creating and editing label formats” on page 84 .
Empty input, please try again.	The label format name is missing.	Enter the label format name.
The printer is not ready.	The printer was not initialized properly or the power was cycled too quickly.	At the Microplate Labeler connection panel (on the back of the applicator), press the power switch to the off (o) position, wait a full 5 seconds, and then press the power switch to the on (I) position.
	The display on the front of the printer indicates a state other than Ready.	Return the printer to the Ready state. For the cab SQUIX printer, see “Using the cab SQUIX printer touchscreen” on page 133 . For the cab A2+ printer, see “Using the cab A2+ printer display and navigator pad” on page 135 .
	The printer power switch is in the off (o) position.	Ensure that the power switch on the back of the printer remains in the on (I) position at all times.

Related topics

For information about...	See...
Routine maintenance	“Routine maintenance” on page 102
Troubleshooting the hardware	“Troubleshooting hardware problems” on page 126
Reporting problems	“Reporting problems” on page 137

Using the cab SQUIX printer touchscreen

About this topic

Agilent Automation Solutions Technical Support might request the printer status information from you when troubleshooting the Microplate Labeler. This topic describes how to view information for the cab SQUIX printer.

CAUTION

Do not use the touchscreen to adjust the printer settings unless directed to do so by Agilent Automation Solutions Technical Support. The printer has been specially configured as part of the Microplate Labeler. Using the touchscreen menus to change the printer settings can cause the Microplate Labeler to fail.






IMPORTANT

The printer display must show the Ready message before you can initialize the device. During operation, the software displays operator messages and error messages on the computer screen.

Touchscreen start page

Figure Touchscreen start page




Icon	See...
	Opens the menu.
	Interrupts the print job or continues the print job. Appears only when a print job is in progress.
	Repeats the last printed label. Available after a print job.
	Cancels all print jobs and returns the printer to the Ready state.
	Feeds a blank label.

Viewing the printer menu

To view the printer menu:

- 1 On the printer touchscreen start page, ensure that the **Ready** message is displayed.


If a message other than Ready appears, click  to stop any printing processes.


- 2 Click  to display the Menu page.

Figure Touchscreen Menu page



On the Menu page, you may view the following items:

 **Info.** Displays information about the printer, including firmware version, Ethernet connection, hours of operation and number of labels, and so forth.

 **Help.** Displays videos on how to clean the printhead, load labels, and load ribbon.

All other menu items are for Agilent use only.

CAUTION

Do not use the touchscreen to adjust the printer settings unless directed to do so by Agilent Automation Solutions Technical Support. Using the touchscreen menus to change the printer settings can cause the Microplate Labeler to fail. The printer has been specially configured as part of the Microplate Labeler.

Using the cab A2+ printer display and navigator pad

About this topic

Agilent Automation Solutions Technical Support might request the device status information from you when troubleshooting the Microplate Labeler. This topic describes how to view the status information for the cab A2+ printer and how to return the printer to the Ready state.

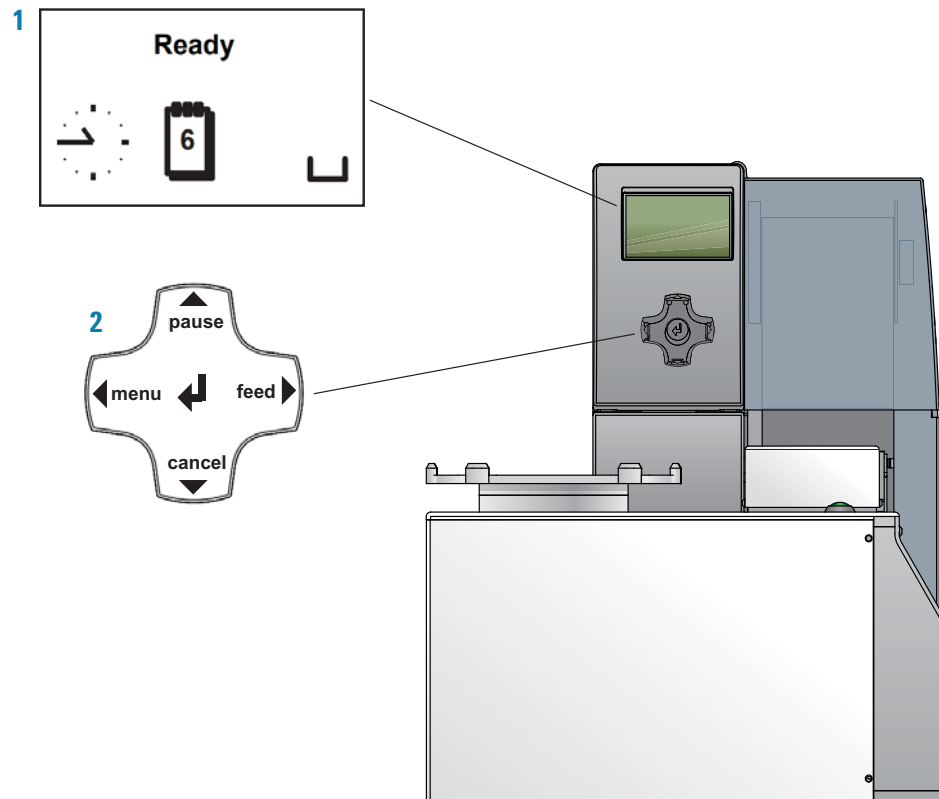
CAUTION

Do not use the navigator pad to adjust the printer settings unless directed to do so by Agilent Automation Solutions Technical Support. Using the printer navigator pad to change the printer settings can cause the Microplate Labeler to fail. The printer has been specially configured as part of the Microplate Labeler.






About the navigator pad and service display

You may use the printer service display (figure, item 1) and the navigator pad (figure, item 2) to access the status menu.

Figure Printer service display and navigator pad








The navigator pad has the following keys. The key functions depend on the current printer state.

Key	Label
	menu
	feed
	pause
	cancel
	-



Viewing the status menu

To view the status menu:

- 1 On the navigator pad (figure, item 2), press the  **menu** key.
- 2 Press the  **feed** key to move to the **Short status** icon in the display, and then press the  key to select the **Short status** menu.
- 3 Click the  and  (pause and cancel) keys to scroll through the individual lines.

Returning the printer display to the Ready state

To return the printer display to the Ready state:

- 1 To exit the status menu press the  key.
- 2 Scroll to the left by pressing the  **menu** key repeatedly until **Ready** appears on the printer display (figure, item 1).

IMPORTANT

The printer display must show the Ready message before you can initialize the device. During operation, the software displays operator messages and error messages on the computer screen.

Related topics

For information about...	See...
Routine maintenance	"Routine maintenance" on page 102
Troubleshooting the hardware	"Troubleshooting hardware problems" on page 126

For information about...	See...
Reporting problems	"Reporting problems" on page 137

Reporting problems

Contacting technical support

If you find a problem with the Microplate Labeler, contact Agilent Automation Solutions Technical Support. For contact information, go to <https://www.agilent.com/en-us/contact-us/page>.

Note: You can also send a software bug report from within the VWorks software.

Reporting hardware problems

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

Reporting software problems

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

- Short description of the problem
- Software version number
- Error message text (or screen capture of the error message dialog box)
- Screen capture of the About VWorks software dialog box
- Relevant software files

To find the VWorks software version number:

In the VWorks software, select **Help > About VWorks**.

To find the Diagnostics software version number:

- 1 Open Diagnostics.
- 2 Read the version number on the title bar of the diagnostics window.

To send compressed protocol and associated files in VZP format:

In the VWorks software, select **File > Export** to export and compress the following files:

- Protocol file
- Device file (includes the device profile and teachpoint file)
- Labware definitions
- Liquid classes
- Pipette techniques
- Hit-picking files
- Plate map files

- Barcode files
- Error library
- Log files
- Form file (*.VWForm)

Reporting user guide problems

If you find a problem with this user guide or have suggestions for improvement, send your comments using one of the following methods:

- Click the feedback button () in the online help.
- Send an email to documentation.automation@agilent.com.

Related topics

For information about...	See...
Routine maintenance and troubleshooting	"Routine maintenance" on page 102
Hardware problems	"Troubleshooting hardware problems" on page 126
Software problems	"Resolving error messages" on page 130



A Quick reference to Diagnostics software

This section provides a quick reference to the Microplate Labeler Diagnostics software. The topics are:

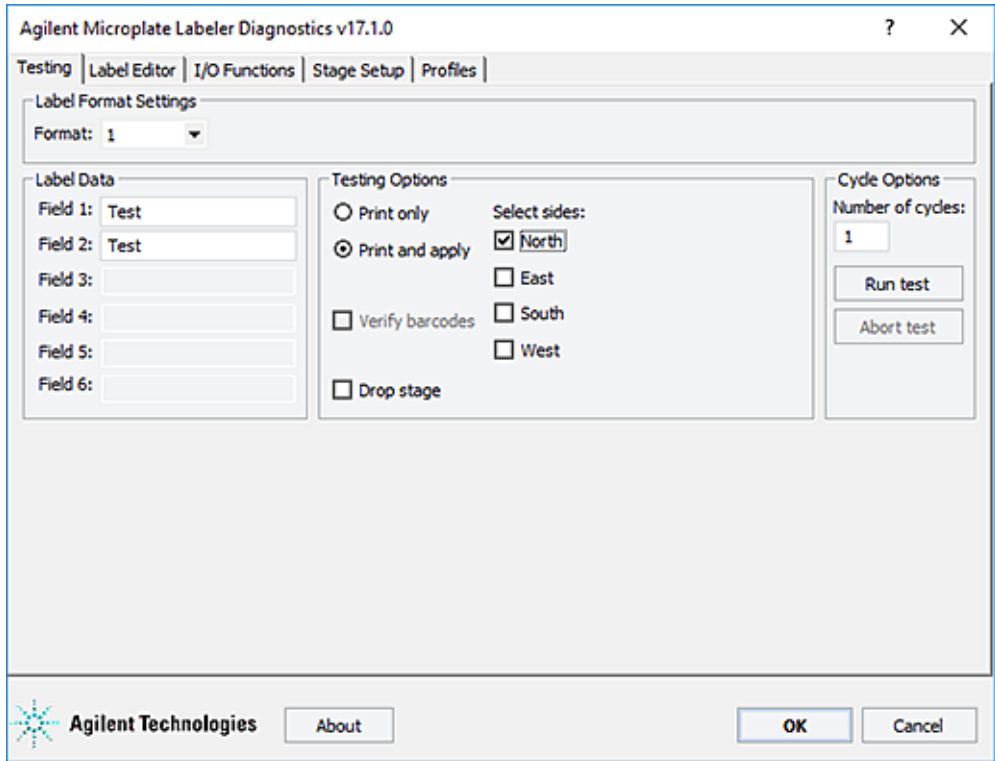
- [“Testing tab” on page 140](#)
- [“Label Editor tab” on page 144](#)
- [“I/O Functions tab” on page 150](#)
- [“Stage Setup tab” on page 156](#)
- [“Profiles tab” on page 160](#)

Testing tab

About this topic

This topic provides a quick reference to the controls and indicators in the Microplate Labeler Diagnostics—Testing tab. You can use the controls and indicators in the Testing tab to perform print or print-and-apply tests.

Figure Testing tab



Testing tab procedures

The Testing tab enables you to:

Procedure	See...
Print or print and apply one or more test labels	“Performing a print-and-apply test” on page 106

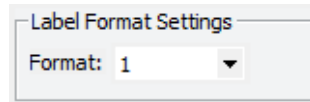
Testing tab contents

The Testing tab contains the following:

- Label Format Settings area
- Label Data area
- Testing Options area

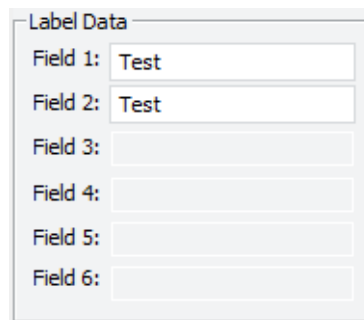
- Cycle Options area

Label Format Settings area



Controls and indicators	Description
Format	Allows you to select a label format that is currently loaded in the printer to use for a print or print-and-apply test.

Label Data area



Controls and indicators	Description
Field 1 to Field 6	<p>Allows you to type text in the designated fields for the test label. Fields that are defined in the label format as barcode fields will be encoded into the specified barcode symbology before printing.</p> <p>The field data entered into Microplate Labeler Diagnostics is temporarily stored in the computer and not the printer, so it can only be used for testing purposes.</p> <p><i>Note:</i> Only the fields defined in the currently selected format are available.</p>

Testing Options area

Testing Options

☐ Print only

☒ Print and apply

☐ Verify barcodes

☐ Drop stage

Select sides:

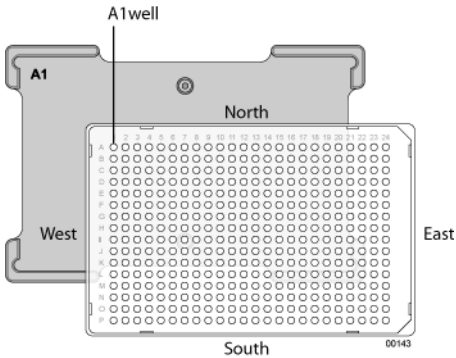
☒ North

☐ East

☐ South

☐ West

Controls and indicators	Description
Print only	Specifies a print operation, where one or more test labels are printed without applying them to microplates.
Print and apply	Specifies a print-and-apply operation, where one or more test labels are printed and applied to microplates.
Verify barcodes	<i>Available for optional barcode reader only.</i> Enables the barcode reader during a print-and-apply test. Use this feature to verify that the barcodes can be read by the barcode reader after the labels are printed and applied to a microplate.
Drop stage	Moves the plate stage to the lower stage position.
Select sides	<p>Specifies the sides of the microplate to which to apply test labels.</p> <p>When the microplate is on the plate stage, the sides of the microplate are referred to as north, south, east, and west as the figure shows.</p>



Cycle Options area

Cycle Options

Number of cycles:

1

Run test

Abort test

Controls and indicators	Description
Number of cycles	<p>Specifies the number of test cycles to run using the specified label data and testing options.</p> <p>For example, if you select format 1, and specify the Print and apply option, the North side, and 10 cycles, the device would print and apply labels onto the North side of 10 microplates.</p>
Run test	Starts the test cycles.
Abort test	Stops the test cycles.

Related information

For information about...	See...
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Other tabs in Microplate Labeler Diagnostics	"Quick reference to Diagnostics software" on page 139
Label formats and fields	"About label formats and content" on page 80

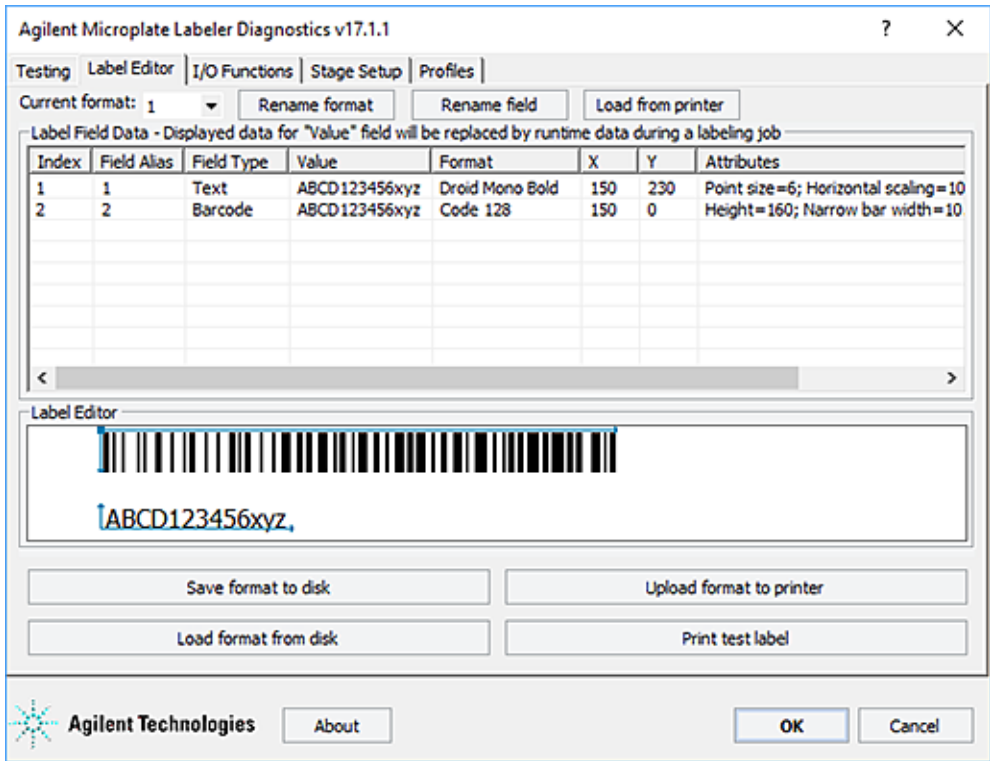
Label Editor tab

About this topic

This topic provides a quick reference to the controls and indicators in the Microplate Labeler Diagnostics—Label Editor tab. You use the controls and indicators in the Label Editor tab to design label formats and save them.

The Microplate Labeler includes templates for the label formats that are ready to use or customize. For an overview of the templates, see [“Templates for barcode formats” on page 165](#).

Figure Label Editor tab



Label Editor tab procedures

The Label Editor tab enables you to:

Procedure	See...
Create or edit label formats	“Creating and editing label formats” on page 84
Print a test label of a format that has been uploaded to the printer	“Printing a test label from the Label Editor tab” on page 92
Upload label formats to the printer	“Uploading and saving a format” on page 91

Procedure	See...
Save label formats to XML files	"Uploading and saving a format" on page 91

Label Editor contents

The Label Editor tab contains the following:

- Format selection list and format buttons
- Label Field Data table
- Label Editor preview box

Format selection list and format buttons

Controls and indicators	Description
Current format	<p>Specifies the format that you are loading into memory for editing, or that you are saving to disk or uploading to the printer.</p> <p>Label format templates are included with the Microplate Labeler. You can load the formats from the printer or from the computer.</p> <p>Only label formats that have been uploaded to the printer can be printed or printed and applied.</p>
Rename format	Opens a dialog box where you can enter a new name for the label format.
Rename field	Opens a dialog box where you can enter an alias for the selected field (Index 1 to Index 6).
Load from printer	Temporarily loads a label format selected in the Current format list from the printer into the Label Editor tab for editing or saving to disk.
Save format to disk	<p>Opens the Save As dialog box where you can save the displayed label format to an XML file. Each label format is saved as a separate XML file.</p> <p>By default, the label formats are in the following folder: C:\VWorks Workspace\Microplate Labeler Label Formats</p> <p>Label formats can be accidentally overwritten in the printer, so you should save backup copies of the label formats in XML files.</p>

Controls and indicators	Description
Load format from disk	<p>Displays the Open dialog box, where you can select a label format that was saved as an XML file, and load the label format into the Label Editor tab temporarily for editing or uploading to the printer.</p> <p>By default, label format templates are installed in the following folder:</p> <p>C:\VWorks Workspace\Microplate Labeler Label Formats</p> <p><i>Note:</i> Only the label formats created for the cab A2+ printer are supported on the Microplate Labeler.</p>
Upload format to printer	<p>Uploads the displayed label format to the printer.</p> <p>Only the label formats stored in the printer are available for labeling protocols (VWorks software), or print-and-apply tests (Microplate Labeler Diagnostics).</p>
Print test label	<p>Performs a test print of a format stored in the printer that you have selected in the Current format list.</p> <p>Only the label formats stored in the printer are available for printing.</p>

Label Field Data table

The Label Field Data table displays the data for the label format that is currently loaded in the Label Editor tab.


Label Field Data - Displayed data for "Value" field will be replaced by runtime data during a labeling job

Index	Field Alias	Field Type	Value	Format	X	Y	Attributes
1	1	Text	ABCD123456xyz	Droid Mono Bold	150	230	Point size=6; Horizontal scaling=10
2	2	Barcode	ABCD123456xyz	Code 128	150	0	Height=160; Narrow bar width=10

Each row in the table represents a field in the currently selected label format. The Label Field Data table columns include the following:

Column	Description
Index	<p>Indicates the number of the field. Each field defined in the label format is given an index number from 1 through 6.</p> <p>Only field 2 can be a barcode field. All other fields can be human-readable text.</p>

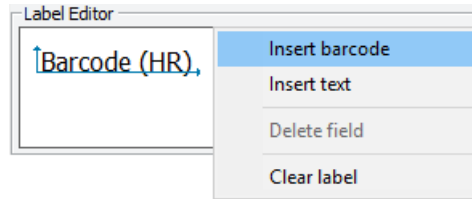
Column	Description
Field Alias	<p>Specifies a name for the field. The default alias is the index number.</p> <p>To change the alias to something more descriptive, select the field row in the table, click the Rename field button, and then type the new name in the dialog box that appears.</p>
Field Type	<p>Specifies whether the field is human-readable text or barcode.</p> <ul style="list-style-type: none"> Field 1 must be human-readable text. Field 2 can be a barcode or human-readable text. Fields 3–6 can be human-readable text. <p>IMPORTANT To ensure that the barcode reader can read a barcode, the label should include a blank margin (quiet zone) on each end of the barcode field. In general, the quiet zone should be 10 times the dimension of the narrowest bar in the barcode or 0.25 inch (0.635 cm), whichever is greater.</p>
Value	<p><i>Test purposes only.</i> Specifies the contents of the field for a test print using the Print test label button in the Label Editor tab.</p> <p>Click the Value box for the given field, click the box again, and then type the new value:</p> <ul style="list-style-type: none"> <i>Text/numeric field.</i> The value is the actual text that will be printed during a test print. <i>Barcode field.</i> The value is the actual data that is encoded into the barcode for a test print. The barcode text should follow the rules of the specified symbology, for example, limited to numbers only or uppercase letters and numbers. <p>These values are not used for production print jobs. When you run a labeling protocol or a print job, the value of each field comes from the data that you select in the VWorks software.</p> <p>If you do print tests from the Testing tab, the values from the Label Editor tab are not used.</p>
Format	<p>Specifies the printing format to be used when printing the field. Assigns the text font or barcode symbology, depending on whether the field is a text field or a barcode field.</p> <p>Ensure that the characters you enter for a barcode field are supported by the selected format (symbology). For an overview of the supported barcode symbologies, see “Barcodes and supported symbologies” on page 97.</p>

Column	Description
X, Y	<p>Specifies the printer coordinates on the label for the position of each field, where</p> <ul style="list-style-type: none"> <i>Text field.</i> The X,Y values specify the bottom, left corner of the field. <i>Barcode field.</i> The X,Y values specify the top, left corner of the field. <p>The Label Editor preview box displays the x, y coordinates as the intersection of a pair of thin blue lines, either at the top left of a barcode field, or the bottom left of a text field.</p>  <p>To change the field position, you can type new values in the X and Y columns. The coordinates are measured in 0.001-in (0.0254-mm) increments. Given a label size of 0.25 by 2.0 in (0.0635 by 5.08 cm), the range of possible values is as follows:</p> <p>Y: 0 to 250 X: 0 to 2000</p> <p><i>Note:</i> Alternatively, you can drag the field to a new position in the Label Editor preview box. However, this is not as precise a method for positioning the field.</p> <p>When the format is uploaded to the printer, the software transfers the x, y coordinates to the printer label coordinates.</p>
Attributes	<p>Indicates the field size and other attributes.</p> <p>For details on changing the attributes, see “Changing the field size and other attributes” on page 92.</p>

Label Editor preview box

The Label Editor preview box allows you to add and delete fields, drag fields to reposition them on the label, and view an approximation of how the printed label will appear. The preview is not precise, and you must test print the label to see the actual field positions, and then adjust as necessary. To specify the exact coordinates, you can type the values for the coordinates in the Label Field Data table X and Y columns.

If you load an undefined format, the Label Editor preview box is empty. To add new fields to format, right-click the preview box to display a shortcut menu.



The shortcut menu contains the following commands:

Command	Description
Insert barcode	<p><i>Available for field 2 only.</i> Inserts a barcode field in the Label Editor preview box and adds a barcode field to the Label Field Data table.</p> <p>A pair of thin blue lines with arrows appear on the top and left sides of the barcode field in the preview box. The intersection of the blue lines represents the printer x, y coordinates for the field position on the label.</p> <p>Only one barcode field is allowed per label format.</p>
Insert text	<p>Inserts a text (human readable) field in the Label Editor preview box and adds a text field to the Label Field Data table.</p> <p>A pair of thin blue lines with arrows appear on the bottom and left sides of the text field in the preview box. The intersection of the blue lines represents the printer x, y coordinates for the field position on the label.</p>
Delete field	Deletes the field that is highlighted in the Label Field Data table.
Clear label	Clears all fields from the Label Editor preview box and the Label Field Data area.

Related information

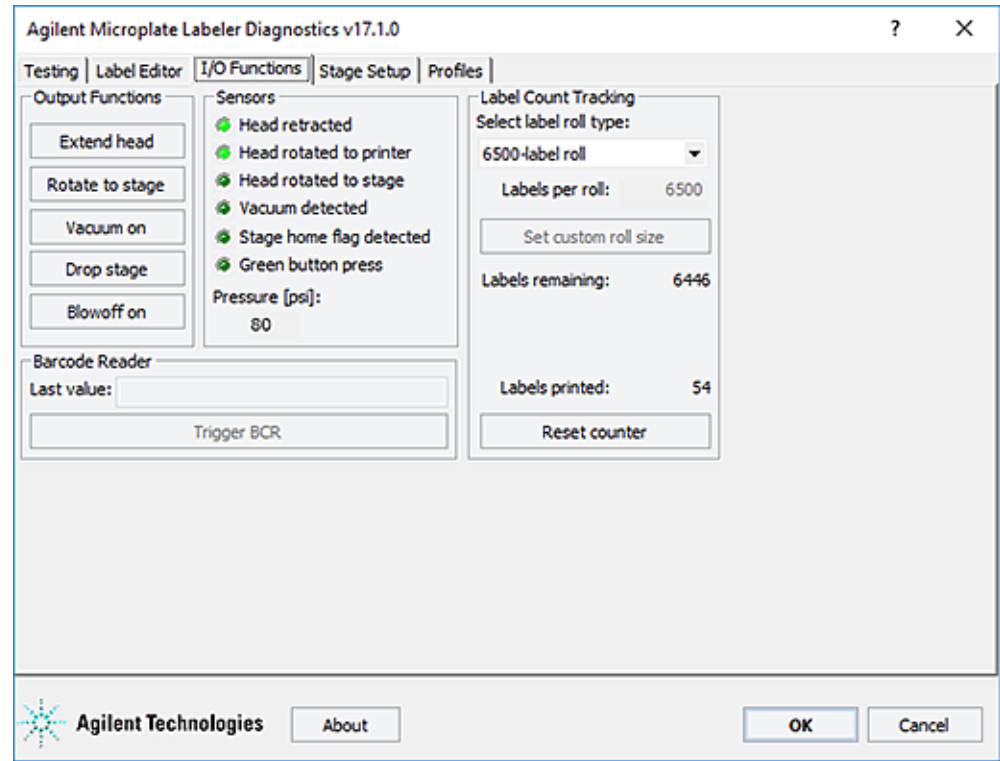
For information about...	See...
Label templates	"Templates for barcode formats" on page 165
Testing tab	"Testing tab" on page 140

I/O Functions tab

About this topic

This topic provides a quick reference to the controls and indicators in the Microplate Labeler Diagnostics—I/O Functions tab. The controls and indicators in the I/O Functions tab are used primarily for verifying the correct functioning of the applicator and for troubleshooting problems.

Figure I/O Functions tab



I/O Functions tab procedures

The I/O Functions tab enables you to:

Procedure	See...
Extend or retract the applicator head	“Checking the basic applicator functions” on page 104
Rotate the applicator head to the plate stage and back to the printer	“Checking the basic applicator functions” on page 104
Turn the vacuum on and off	“Checking the basic applicator functions” on page 104
Move the plate stage from the top position to the bottom position and back	“Checking the basic applicator functions” on page 104

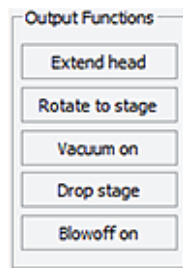
Procedure	See...
Turn on and off the blowoff air	"Checking the basic applicator functions" on page 104
Check the regulated air pressure	"Checking the basic applicator functions" on page 104
Reset the labels printed counter to track the labels used per roll	"Resetting the label counter in the Diagnostics software" on page 117
Trigger the barcode reader	"Testing the barcode reader using Diagnostics" on page 112

I/O Functions tab contents

The I/O Functions tab contains the following:

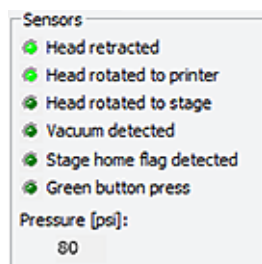
- Output Functions area
- Sensors area
- Label Count Tracking area
- Barcode Reader area

Output Functions area



Controls and indicators	Description
Extend head/ Retract head	Extends or retracts the applicator head.
Rotate to stage/ Rotate to printer	Rotates the applicator head to the plate stage or to the printer.
Vacuum on/Vacuum off	Turns on or off the vacuum to the vacuum pads on the applicator head.
Drop stage/Raise stage	Moves the plate stage to the upper or lower stop position.
Blowoff on/Blowoff off	Turns on or off the blowoff air to the applicator head.

Sensors area



If a sensor indicator fails to light, the sensor might be faulty or require an adjustment. Contact Agilent Automation Solutions Technical Support for assistance.

Controls and indicators	Description
Head retracted	Lights when the applicator head is in the retracted position (away from the printer).
Head rotated to the printer	Lights when the applicator head is rotated to the printer.
Head rotated to stage	Lights when the applicator head is rotated toward the plate stage.
Vacuum detected	Lights when the vacuum is turned on and the vacuum pads on the applicator head are holding a label.
Stage home flag detected	<p>Lights when the plate stage rotation sensor detects the home flag. The light should be lit when the plate stage moves counterclockwise from the home position and extinguished when the plate stage moves clockwise from the home position.</p> <p><i>Note:</i> If the plate stage rotates a full revolution and the light does not change state, the sensor might be faulty.</p>
Green button press	Lights when the green button on the top of the device is pressed and held.
Pressure (psi)	<p>Indicates the current air pressure inside the Microplate Labeler after the pressure has been regulated by the internal pressure regulator.</p> <p>The readout should be 80 psi (0.55 MPa), minimum.</p> <ul style="list-style-type: none"> <i>If the readout is <80 psi.</i> Verify that the air source is supplying 80 psi (0.55 MPa), minimum. If the source is above 80 psi and the readout is below 80 psi, use the pressure regulator knob on the back of the applicator to increase the pressure. <i>If the readout is >87 psi.</i> Use the pressure regulator knob on the back of the applicator to lower the pressure to 85 psi (0.58 MPa), maximum. <p>For instructions on setting the air pressure, see "Setting the air pressure" on page 38.</p>

Label Count Tracking area

The Label Count Tracking settings are saved to the printer.

Label Count Tracking

Select label roll type:
6500-label roll

Labels per roll: 6500

Set custom roll size

Labels remaining: 6446

Labels printed: 54

Reset counter

Controls and indicators	Description
Select label roll type	Specifies the number of labels on the label roll.
Labels per roll	Available only if you select Custom roll size from the Select label roll type list. Allows you to set a roll size other than the standard sizes available in the list.
Set custom roll size	Available only if the Custom roll size option is selected. Applies the value entered in the Labels per roll box.
Labels remaining and Labels printed	Specifies labels remaining and the labels printed since the counter was reset. The labels remaining and labels printed typically equal the labels per roll.
Reset counter	Resets the label counter so that the Labels printed field indicates 0. Click Reset counter when you load a new roll of labels.

Barcode Reader area

Barcode Reader

Last value:

Trigger BCR

Controls and indicators	Description
Last value	Indicates the value read by the barcode reader.

Controls and indicators	Description
Trigger BCR	<i>Available only if barcode reader is installed and initialized.</i> Causes the barcode reader to scan the label of the microplate on the plate stage, and then displays the reading in the Last value box.

Related information

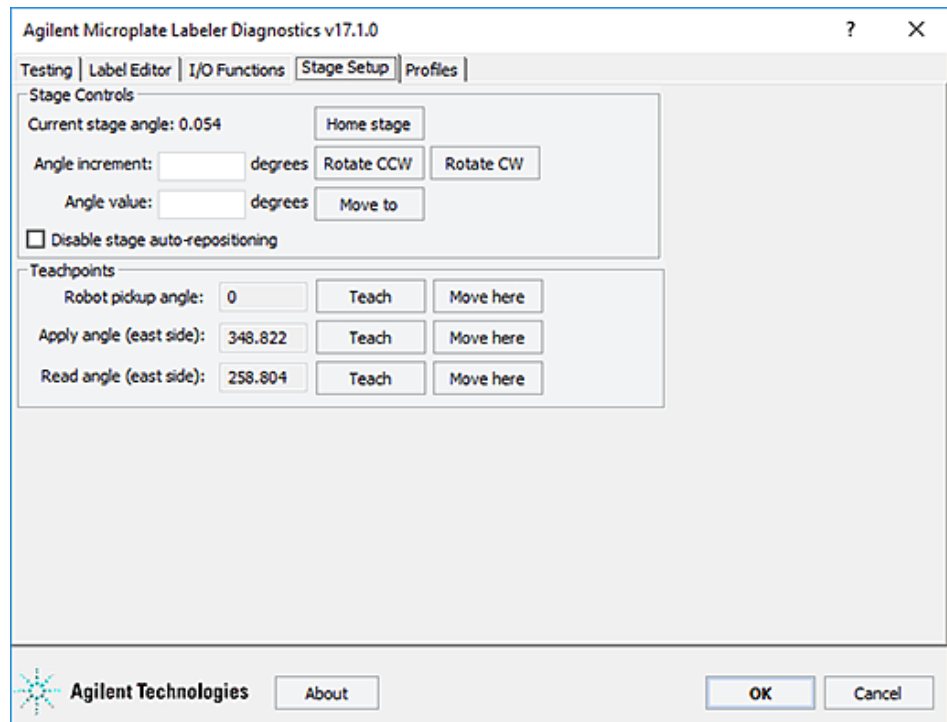
For information about...	See...
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Other tabs in Microplate Labeler Diagnostics	"Quick reference to Diagnostics software" on page 139
Plate stage positions	"About plate stage and applicator head positions" on page 69

Stage Setup tab

About this topic

This topic provides a quick reference to the controls and indicators in the Microplate Labeler Diagnostics—Stage Setup tab. The controls in the Stage Setup tab enable you to rotate the plate stage and to reset the plate stage angles (teachpoints) when setting up the device.

Figure Stage Setup tab



Stage Setup tab procedures

The Stage Setup tab enables you to:

Procedure	See...
Home the plate stage	"Using plate stage controls in Diagnostics" on page 109
Rotate plate stage	"Using plate stage controls in Diagnostics" on page 109
Enable or disable plate stage auto-repositioning	"Using plate stage controls in Diagnostics" on page 109
Set teachpoints	<ul style="list-style-type: none"> "Using plate stage controls in Diagnostics" on page 109 "Setting the robot pickup angle teachpoint" on page 76

CAUTION

The plate stage teachpoints are associated with a specific device profile and stored in the Windows registry. If you delete a profile, the teachpoints are also deleted.

Stage Setup tab contents

The Stage Setup tab contains the following:

- Stage Controls area
- Teachpoints area

Stage Controls area

The screenshot shows the 'Stage Controls' window. It contains the following elements:

- A label 'Current stage angle: 0.054'.
- A button labeled 'Home stage'.
- Two input fields: 'Angle increment: [] degrees' and 'Angle value: [] degrees'.
- Two buttons: 'Rotate CCW' and 'Rotate CW'.
- A button labeled 'Move to'.
- A checkbox labeled 'Disable stage auto-repositioning' which is currently unchecked.

Controls and indicators	Description
Current stage angle	Displays the current angle of the plate stage. As you face the front of the device, 0 degrees is the left side of the plate stage. Rotating the plate stage clockwise increases the angle.
Home stage	Initiates the homing sequence that searches for the plate stage home position and sets that position as 0 degrees.
Angle increment (degrees)	Specifies a relative value to use when rotating the plate stage using the Rotate CCW and Rotate CW buttons. Each time the Rotate CCW or Rotate CW button is pressed, the plate stage moves by the specified increment in the designated direction.
Rotate CCW	Rotates the plate stage counterclockwise by the amount specified in the Angle increment box.
Rotate CW	Rotates the plate stage clockwise by the amount specified in the Angle increment box.
Angle value (degrees)	Specifies an absolute value to which the plate stage will move when the Move to button is pressed.
Move to	Moves the plate stage to the absolute position specified in the Angle value box.
Disable stage auto-repositioning	Enables or disables auto-repositioning for the plate stage. Default is not selected (auto-repositioning is enabled). <i>When enabled.</i> If the plate stage is moved from a position by an outside force (for example, if someone rotates the stage by hand), the auto-repositioning feature automatically moves the plate stage back to the last angle. <i>When disabled.</i> If the plate stage is rotated manually it remains at the new position. This can be useful when setting up, troubleshooting, or performing maintenance on the Microplate Labeler.

Teachpoints area

Teachpoints		
Robot pickup angle:	<input type="text" value="0"/>	<input type="button" value="Teach"/> <input type="button" value="Move here"/>
Apply angle (east side):	<input type="text" value="348.822"/>	<input type="button" value="Teach"/> <input type="button" value="Move here"/>
Read angle (east side):	<input type="text" value="258.804"/>	<input type="button" value="Teach"/> <input type="button" value="Move here"/>

Controls and indicators	Description
Robot pickup angle	<p>Specifies the position that the plate stage returns to when a print-and-apply cycle is completed.</p> <p>Default setting: 0</p> <p>For devices that are integrated in a lab automation system or workstation, this is the position where an external robot picks up or places a microplate on the plate stage.</p> <p>To set the value, use the controls in the Stage Controls area to move the plate stage to the desired position. Click Teach to set the position.</p>
Apply angle (east side)	<p>Specifies the teachpoint position to which the plate stage rotates so that the east side faces the applicator head.</p> <p>Default setting: 349, approximate</p> <p>To move the plate stage so that each of the other sides face the applicator head, the software uses angles 90- , 180- , and 270-degrees from the teachpoint.</p>
Read angle (east side)	<p>Specifies the teachpoint position to which the plate stage rotates so that the east side faces the optional barcode reader.</p> <p>Default setting: 259, approximate</p> <p>To move the plate stage so that each of the other sides face the barcode reader, the software uses angles 90- , 180- , and 270-degrees from the teachpoint.</p>
Teach	Resets the teachpoint coordinates for the corresponding angle.
Move here	Moves the plate stage to the corresponding teachpoint.

Related information

For information about...	See...
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Other tabs in Microplate Labeler Diagnostics	"Quick reference to Diagnostics software" on page 139
Testing the Microplate Labeler functions	"Checking the basic applicator functions" on page 104
How the plate stage and applicator move	"About plate stage and applicator head positions" on page 69

Profiles tab

About this topic

This topic provides a quick reference to the controls and indicators in the Microplate Labeler Diagnostics—Profiles tab. You use the controls in the Profiles tab to create or modify the device communication profiles and to initialize a profile to use while controlling the device from Microplate Labeler Diagnostics.

CAUTION

Each profile can be used by multiple protocols. Deleting, renaming, or changing the parameters for a profile based on one protocol can invalidate other protocols that use the profile.

CAUTION

The plate stage teachpoints are associated with a specific device profile and stored in the Windows registry. If you delete a profile, the teachpoints are also deleted.

Figure Profiles tab

Agilent Microplate Labeler Diagnostics v17.1.0

Testing | Label Editor | I/O Functions | Stage Setup | **Profiles**

Profile Management

Profile name:
Labeler

Create a new profile

Create a copy of this profile

Rename this profile

Delete this profile

Update this profile

Initialize this profile

Profile Settings

Current IP address:

Current MAC address:

Firmware version:

☐ Serial connection COM3

☒ Ethernet connection **Select Microplate Labeler**

Device ID: 0

Printer type: cab

Label size: 2.0" X 0.25"

☐ Disable tracking of remaining labels

☐ Verify barcodes after PrintAndApply

Max apply retries: 5

Max pick retries: 5

Max print/pick retries: 3

Agilent Technologies About OK Cancel

Profiles tab procedures

The Profiles tab enables you to:

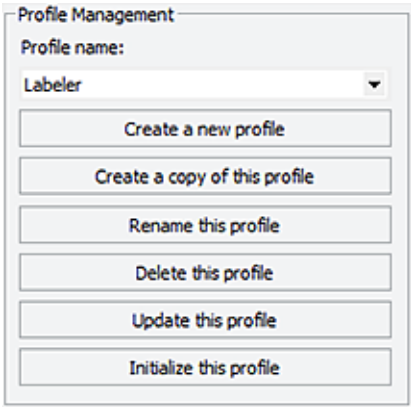
Procedure	See...
Create and manage profiles	"Creating a profile" on page 64
Initialize a profile to use in Microplate Labeler Diagnostics	"Initializing the device in diagnostics" on page 66

Profiles tab contents

The Profiles tab contains the following:

- Profile Management
- Profile Settings

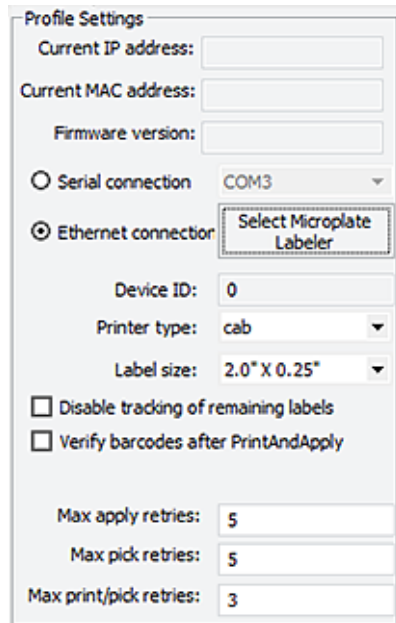
Profile Management area



Controls and indicators	Description
Profile name	Displays the list of available profiles, and allows you to select a profile to manage.
Create a new profile	Opens the Create Profile dialog box so that you can create a new profile.
Create a copy of this profile	Creates a copy of the selected profile. By default the copy is named, <i>Copy of nnn</i> .
Rename this profile	Opens the Rename Profile dialog box where you can give a new name to the selected profile.
Delete this profile	Deletes the profile selected in the Profile name list.
Update this profile	Saves changes to the selected profile.

Controls and indicators	Description
Initialize this profile, Reinitialize this profile, or Close this profile	Initializes or reinitializes the selected profile for controlling the device via Microplate Labeler Diagnostics, or closes the currently initialized profile.

Profile Settings area



Controls and indicators	Description
Current IP address	<i>Ethernet connection only.</i> When communication is established with the device using the given profile, displays the current IP address of the device.
Current MAC address	<i>Ethernet connection only.</i> When communication is established with the device using the given profile, displays the current MAC address of the device.
Firmware version	When communication is established with the device using the given profile, displays the current firmware version of the device.
Serial connection	<i>Serial connection only.</i> Specifies the serial port on the computer for serial communication with the Microplate Labeler. Select the computer COM port for the serial connection from the list.
Ethernet connection	<i>Ethernet connection only.</i> Specifies an Ethernet connection for the Microplate Labeler.

Controls and indicators	Description
Device ID	Displays the device ID for the Microplate Labeler after communication with the device is established.
Select Microplate Labeler	Opens the Discovered Bionet Devices dialog box where you can select the Microplate Labeler that you want to connect to using an Ethernet connection.
Printer type	Specifies the printer model. For the Microplate Labeler, make sure you select the cab printer.
Label size	Specifies the label size.
Disable tracking of remaining labels	Disables the remaining value on the I/O Functions tab.
Verify barcodes after Print and Apply	<i>Available for optional barcode reader only.</i> Verifies that every barcode label that is printed and applied can be read by the barcode reader.
Max apply retries	The number of times the device will attempt to apply a label if the applicator head fails to apply the label to a microplate on the plate stage.
Max pick retries	The number of times the device will attempt to pick a label from the printer before giving up on that label and discarding it.
Max print/pick retries	The number of times the device will print a new label and attempt to pick it before displaying an error. For each label that is printed, the device will attempt to pick the printed label based on the Max pick retries value.

Related information

For information about...	See...
Opening Microplate Labeler Diagnostics	"Opening Diagnostics" on page 62
Other tabs in Microplate Labeler Diagnostics	"Quick reference to Diagnostics software" on page 139
Connection of the Microplate Labeler	"Connecting the device to the computer" on page 41
Establishing communications using VWorks software	"Creating a VWorks device file" on page 58

B Templates for barcode formats

This appendix contains the following topics:

- [“Templates overview” on page 166](#)
- [“Template 1—Code 128 over small text field” on page 168](#)
- [“Template 2—Code 128 barcode only” on page 169](#)
- [“Template 3—Single large text field only” on page 170](#)
- [“Template 4—Big text field and Code 128” on page 172](#)
- [“Template 5—Four small text fields” on page 173](#)
- [“Template 6—Data Matrix symbology with large text field” on page 175](#)
- [“Template 7—Data Matrix symbology with two small text fields” on page 177](#)
- [“Template 8—PDF 417 symbology over medium-size text field” on page 179](#)
- [“Template 9—PDF 417 symbology over small text field” on page 181](#)

Templates overview

The Microplate Labeler includes the following set of predefined label formats that are ready to use.




Templates are loaded in the printer and installed in the following folder as XML files:

C:\VWorks Workspace\Microplate Labeler Label Formats

IMPORTANT

Make sure that the barcode reader is capable of decoding the chosen barcode symbology before making a final choice in label format. The 2D symbologies (Templates 6-9) require a barcode reader that is capable of imaging instead of scanning.

Template	Printed image	Description
1		Code 128 over small text field. Provides a blend of data density, machine readability, and human readability. For details, see “Template 1—Code 128 over small text field” on page 168
2		Code 128 barcode only. Provides the best machine readability. You can pair this label with a second label to add human-readable text, for example, template 3 or 5. For details, see “Template 2—Code 128 barcode only” on page 169
3		Single large text field only. Provides maximum legibility of human-readable text. You can pair this label with a barcode-only label, for example, template 2. For details, see “Template 3—Single large text field only” on page 170
4		Big text field and Code 128. Provides the best machine readability and human readability in a single label for those with smaller amounts of data (10 numerals or 6 alpha characters, maximum). For details, see “Template 4—Big text field and Code 128” on page 172
5		Four small text fields. Provides useful amount of human-readable information that can be added to a microplate that already has a barcode label. For details, see “Template 5—Four small text fields” on page 173
6		Data Matrix with large text field. Provides Data Matrix version of template 1. The 2D symbology allows space for a much larger text field than that in template 1. For details, see “Template 6—Data Matrix symbology with large text field” on page 175

Template	Printed image	Description
7		Data Matrix with two small text fields. Leverages the data density of 2D Data Matrix symbology to encode a large amount of data. For details, see “Template 7—Data Matrix symbology with two small text fields” on page 177
8		PDF 417 over medium-size text field. Provides 2D symbology in a format similar to templates 1 and 6 but with slightly more data capacity. For details, see “Template 8—PDF 417 symbology over medium-size text field” on page 179
9		PDF 417 over small text field. Provides the data density and shape of 2D PDF 417 symbology to encode the largest amount of data on a label this size. For details, see “Template 9—PDF 417 symbology over small text field” on page 181

Related information

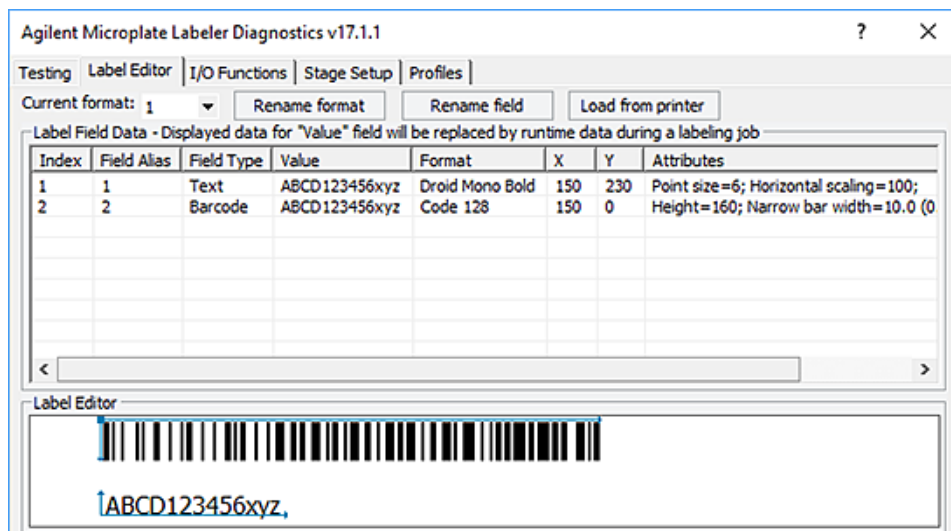
For information about...	See...
Opening Microplate Labeler Diagnostics	“Opening Diagnostics” on page 62
Other tabs in Microplate Labeler Diagnostics	“Quick reference to Diagnostics software” on page 139
Label formats and content	“About label formats and content” on page 80
Creating and editing label formats	“Creating and editing label formats” on page 84
Printing test labels	“Performing a print-and-apply test” on page 106

Template 1—Code 128 over small text field

Example label



Label Editor parameters and preview



Overview

Template 1 uses Code 128 symbology, which offers reasonable data capacity and can be read by a great range of readers. The barcode stretches the length of the label to enable maximum data capacity. The text field can be used to repeat the barcode data as human-readable text.

Specs for symbology

Maximum data: 24 numerals or 12 alpha characters (The maximum alphanumeric length depends on the character mix.)

Note: Higher data density for numerals is achieved because they are encoded in pairs. So, a number with 23 numerals will not fit.

Design features

- Code 128 is commonly used and offers good data density for this size label.
- The narrow bar width gives good readability and accommodates a good amount of data.
- The left blank margin is 1.27-mm (0.05-in) wider than the minimum required quiet zone of 10 times the narrow bar width.
- The blank margin to the right of the barcode will fluctuate in size with the amount of data encoded. The example shows the maximum length barcode while still maintaining a 3.81-mm (0.15-in) right margin.

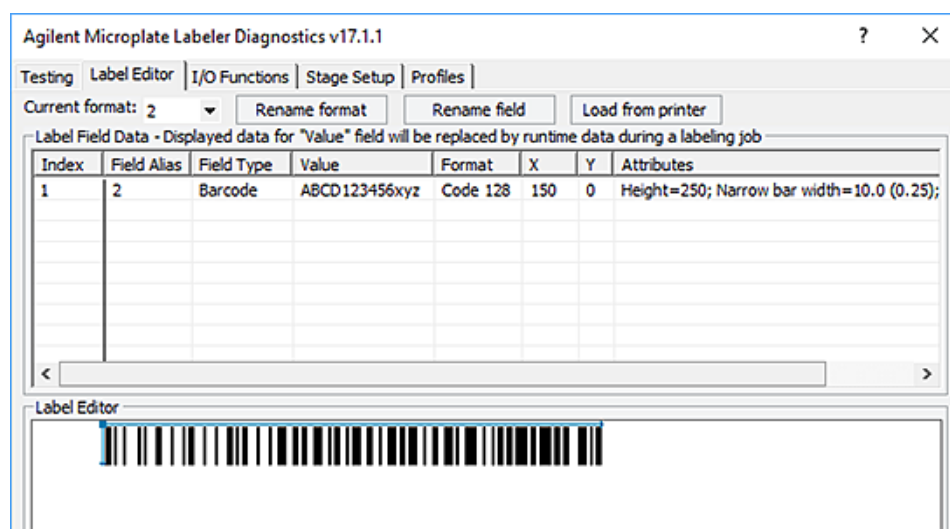
- The barcode extends to the top of label to maximize use of vertical space. The barcode height offers reasonable vertical redundancy to facilitate machine readability, and still allows room for a text field that is legible.
- Minimal space separates the barcode and the text field.
- The text field is left-justified to allow longer strings to fit on the label. The Droid Mono Bold font offers consistent character spacing, and the font is small to allow maximum space for the barcode, while still providing legible text.
- A 0.51-mm (0.02-in) blank margin below the text allows for some vertical drift in the printing.

Template 2—Code 128 barcode only

Example label



Label Editor parameters and preview



Overview

Template 2 provides machine readability. You can pair this label with a second label to add human-readable text, for example, template 3 or 5.

Specs

Maximum data: 24 numerals or 12 alpha characters (The maximum alphanumeric length depends on the character mix.)

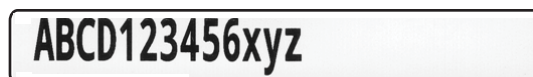
Note: Higher data density for numerals is achieved because they are encoded in pairs. So, a number with 23 numerals will not fit.

Design features

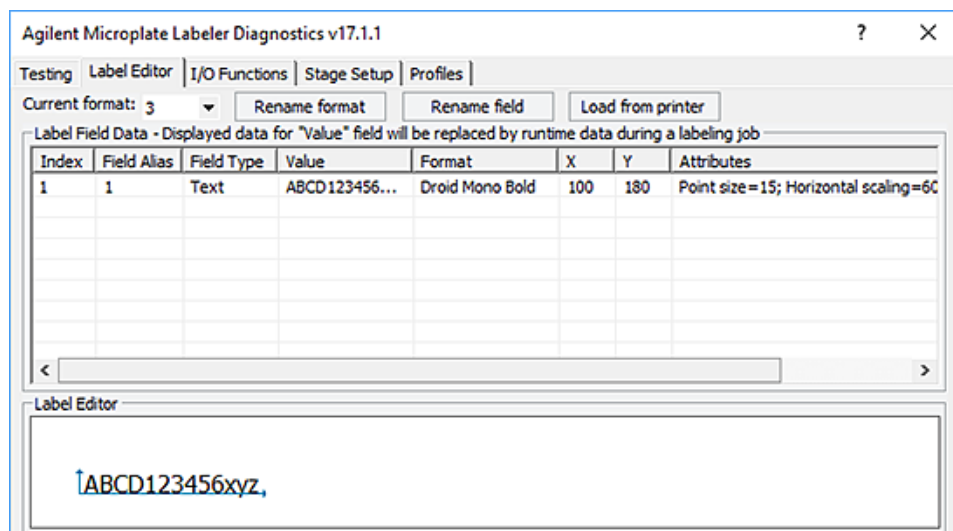
- Code 128 is very common and offers good data density for this size label.
- The narrow bar width gives good readability and accommodates a good amount of data.
- The left blank margin is 1.27-mm (0.05-in) wider than the minimum required quiet zone of 10 times the narrow bar width.
- The blank margin to the right of the barcode will vary depending on the amount of data encoded. The example shows the maximum length barcode while still maintaining a 3.81-mm (0.15-in) right margin.
- The barcode extends to the top of label to maximize use of vertical space.

Template 3—Single large text field only

Example label



Label Editor parameters and preview



Overview

Template 3 is a text-only label format, designed to be paired with the barcode-only label in Template 2.

Specs

Maximum data: 24 characters, any type

Design features

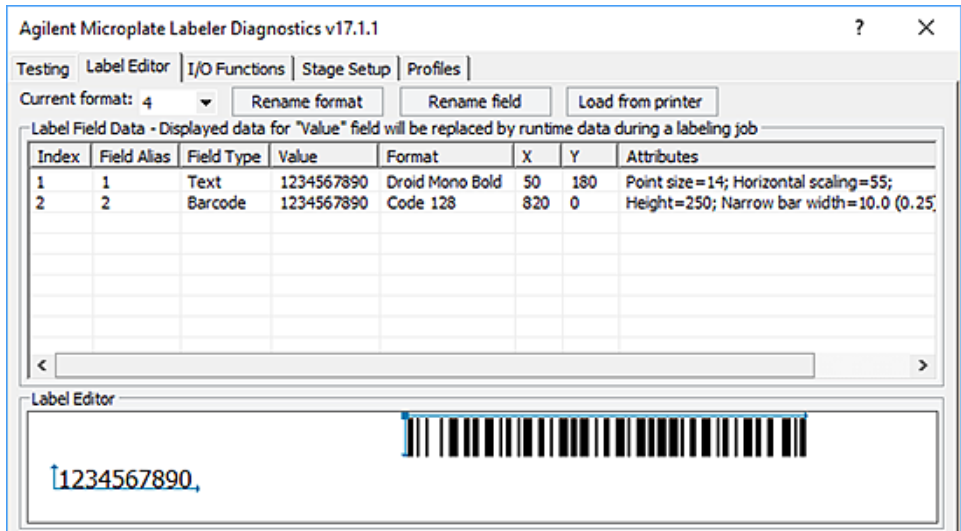
- The Droid Mono Bold font offers consistent character spacing, discernible characters, and a modern, look.
- The text height is maximized within the height of the label.
- A blank margin above the text allows for 0.76-mm (0.030-in) vertical print drift.
- A blank margin below the text allows room for lowercase descenders, such as g or q, while also providing allowance for vertical print drift.
- The generous left margin allows for horizontal print drift. The print drift specification is ± 0.76 -mm (± 0.030 -in) for positioning the edge of the label to the edge of the label backing.
- The size of the right margin varies depending on the number of characters.
- The horizontal scaling of the text field squeezes enough characters onto the label to match the maximum data encoded in the barcode on the Template 2 label.

Template 4—Big text field and Code 128

Example label



Label Editor parameters and preview



Overview

Template 4 provides the best machine readability and human readability in a single label for those with smaller amounts of data (10 numerals or 6 alpha characters, maximum).

Specs

Maximum data: 10 numerals or 6 alpha characters (The maximum alphanumeric length depends on the character mix.)

Design features

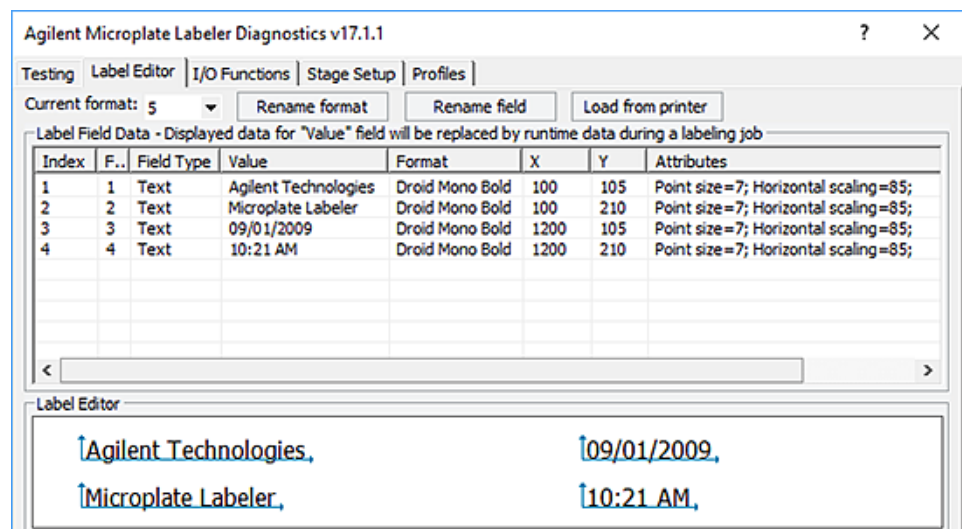
- Code 128 is very common and offers good data density for this size label.
- Narrow bar width gives good readability and accommodates a good amount of data.
- The blank margin to the right of the barcode will fluctuate in size with the amount of data encoded. The example shows the maximum length barcode while still maintaining a 3.81-mm (0.15-in) right margin.
- The barcode extends from top to bottom to maximize vertical redundancy, which facilitates machine readability.
- Minimal space separates the barcode and the text.
- The blank margin separating the text field and the barcode is 0.64-mm (0.025-in) wider than the minimum quiet zone required for machine readability.
- The Droid Mono Bold font offers consistent character spacing, discernible characters, and a modern look.
- The text height is maximized within the height of the label.
- A blank margin above the text allows for 0.76-mm (0.030-in) vertical print drift.
- A blank margin below the text allows room for lowercase descenders, such as g and q, while also providing allowance for vertical print drift.
- The left margin allows for horizontal print drift.
- The horizontal scaling of the text field squeezes enough characters onto the label to match the maximum data encoded in the barcode.

Template 5—Four small text fields

Example label

Agilent Technologies	09/01/2009
Microplate Labeler	10:21 AM

Label Editor parameters and preview



Overview

Template 5 features four text fields. This text-only label can be paired with a barcode-only label, such as Template 2, on the same microplate.

Specs for text

Fields 1 and 2 (left): 20 characters, maximum

Fields 3 and 4 (right): 13 characters, maximum

Design features

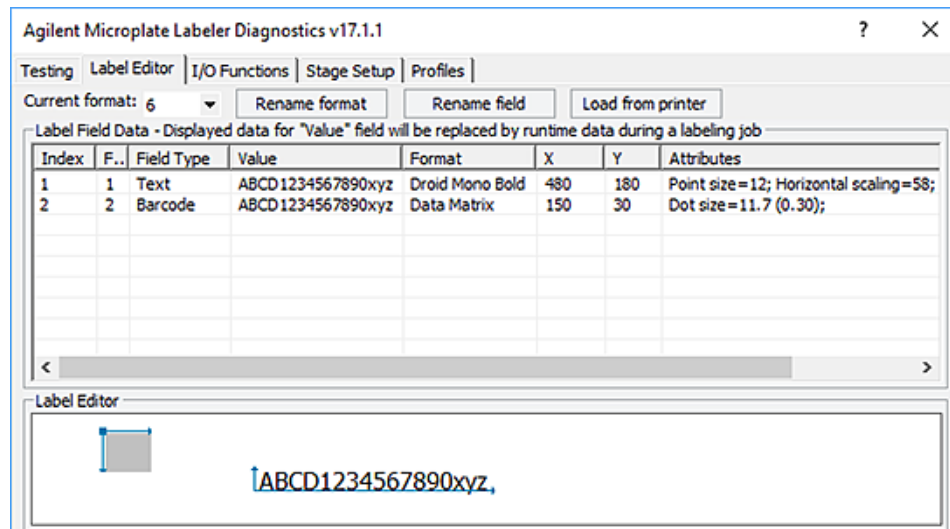
- The Droid Mono Bold font offers consistent character spacing, discernible characters and a modern look.
- The text height is scaled to fit one field above the other in the vertical space. Horizontal scaling offers good data density without sacrificing legibility.
- Above the text, a blank margin allows for some vertical print drift.
- Adequate space separates each field to prevent characters from overlapping, even with a mix of uppercase and lowercase characters.
- Below the text, a blank margin allows room for lowercase descenders, such as g and q, while also providing allowance for vertical print drift.
- Generous left and right margins allow for horizontal print drift. The print drift specification is $\pm 0.76\text{-mm}$ ($\pm 0.030\text{-in}$) for positioning the edge of the label to the edge of the label backing.
- The usable width of fields 1 and 2 (left) is slightly greater than fields 3 and 4 (right), offering options for both longer and shorter data sets.

Template 6—Data Matrix symbology with large text field

Example label



Label Editor parameters and preview



Overview

The Data Matrix symbology (with this dot size) encodes roughly the same amount of data that can fit on a label with the Code 128 symbology. So, Template 6 is analogous to Template 1. Because the Data Matrix symbology is so much denser than the Code 128 symbology, the text field can be much larger than the corresponding one that is paired with Code 128 in Template 1.

Specs

Maximum data: 24 numerals or 16 alpha characters (The maximum alphanumeric length depends on the character mix.)

Design features

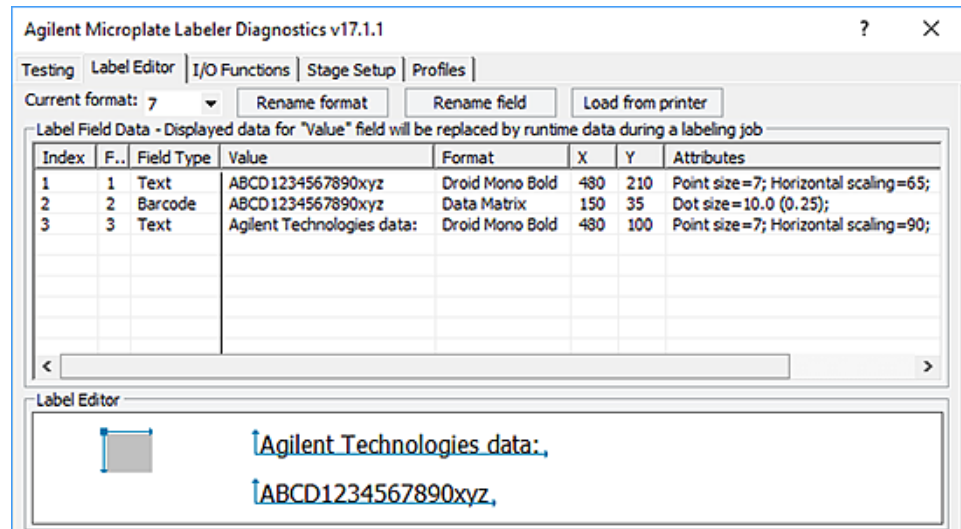
- Data Matrix is a very dense and popular 2D symbology.
- The dot size used in this template is conservative for good readability.
- Generous margins are provided on both the right and left of the barcode.
- The blank margin above the barcode allows for 0.76-mm (0.030-in) vertical print drift.
- The blank margin below the barcode will vary depending on the amount of data encoded. The example shows the maximum data length while still maintaining a 0.76-mm (0.030-in) bottom margin.
- The barcode is positioned to the left of the text in the event that too much data is used for the text fields. In this case, the text will run off the right edge of the label and will not interfere with the barcode.
- The Droid Mono Bold font offers consistent character spacing, discernible characters, and a modern look.
- The font size is large to offer optimum legibility.
- The text field is scaled horizontally so it can fit enough characters to match the data that can be encoded in the barcode.
- The text field is left-justified to allow for the longest possible strings for the available space.
- Generous space above and below the text allow for vertical print drift.

Template 7—Data Matrix symbology with two small text fields

Example label



Label Editor parameters and preview



Overview

The use of the Data Matrix symbology with this dot size allows a large amount of data to be encoded into a symbol that only uses a small portion of the label. Template 7 leverages the large remaining space for two text fields. The upper text field can contain any extra information that might be useful on the label. The lower text field is sized to match the same number of characters that can fit in the barcode.

Specs

Maximum data: 36 numerals or 25 alpha characters (The maximum alphanumeric length depends on the character mix.)

Design features

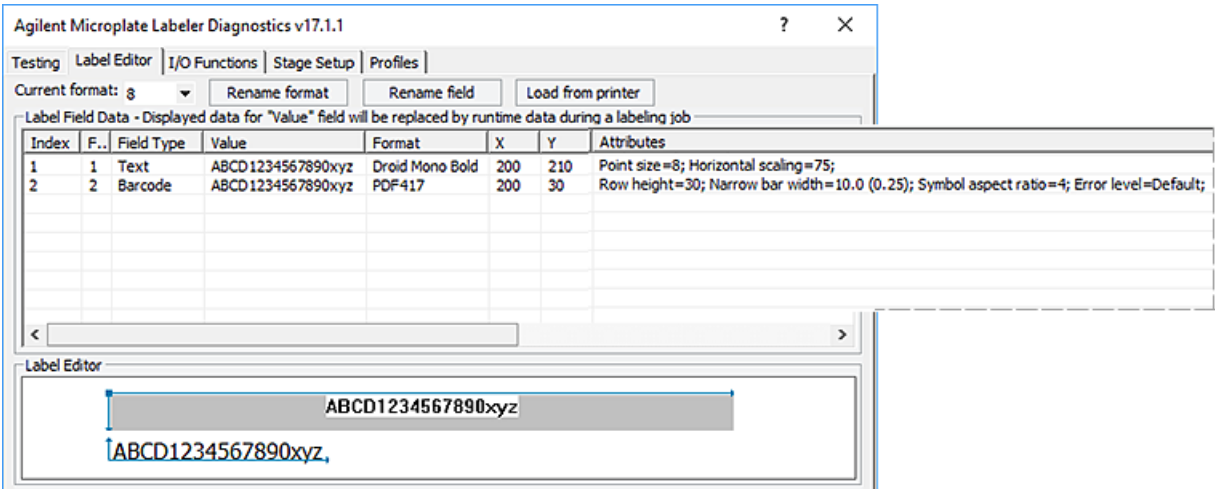
- Data Matrix is a very dense and a very popular 2D symbology.
- The dot size used in this template is relatively conservative for readability, but still allows for twice the amount of data that can fit on a label with the Code 128 symbology.
- Generous margins are provided on both the right and left of the barcode.
- The blank margin above the barcode allows for 0.89-mm (0.035-in) vertical print drift.
- The blank margin below the barcode will vary depending on the amount of data encoded. The example shows the maximum data length while still maintaining a 0.89-mm (0.035-in) bottom margin.
- The barcode is positioned to the left of the text in the event that too much data is used for the text fields. In this case, the text will run off the right edge of the label and will not interfere with the barcode.
- The Droid Mono Bold font offers consistent character spacing, discernible characters, and a modern, attractive look.
- Text field 1 (top) offers good legibility and space for up to 26 characters.
- Text field 2 (bottom) compresses the horizontal scaling to match the data that can be encoded in the symbol.
- The text fields are left-justified to allow for the longest possible strings in the available space.
- Margins above and below the text are adequate to allow for some vertical print drift.

Template 8—PDF 417 symbology over medium-size text field

Example label



Label Editor parameters and preview



Overview

The PDF 417 symbology can be used to create a template that is analogous to Templates 1 and 6. In this case, slightly more data can be encoded than in either the Code 128 or Data Matrix symbologies, while maintaining a medium-size text field.

Specs

Maximum data: 33 numerals or 24 alpha characters (The maximum alphanumeric length depends on the character mix.)

Design features

- PDF 417 can encode large amounts of data.
- The narrow bar width used in this template provides good readability while allowing a large amount of data to be encoded.
- In compliance with recommended practices, the format features a row height at least three times the narrow bar width.
- The symbol aspect ratio is set so the symbol will stretch across the label and allow space below the barcode for text.
- The format uses the printer's default error level of 0.
- Generous margins are provided on both the right and left of the barcode.
- A blank margin above the barcode allows for 0.76-mm (0.030-in) vertical print drift.
- The space below the symbol will vary depending on the amount of data encoded. The example shows the maximum data length, while still maintaining a 0.25-mm (0.01-in) margin to separate the text and the barcode.
- The Droid Mono Bold font offers consistent character spacing, discernible characters, and a modern look.
- The font size is larger than what is used with Code 128 in Template 1 but smaller than what is used with Data Matrix in Template 6.
- The text field is scaled horizontally to match the data that can be encoded in the barcode.
- The text has a generous margin on the left. The margin on the right will vary depending on number of characters.
- The text field is left-justified to allow for the longest possible string in the available space.
- A blank margin below the text allows for some vertical print drift.

Template 9—PDF 417 symbology over small text field

Example



Label Editor parameters and preview

Agilent Microplate Labeler Diagnostics v17.1.1

Testing | Label Editor | I/O Functions | Stage Setup | Profiles

Current format: g Rename format Rename field Load from printer

Label Field Data - Displayed data for "Value" field will be replaced by runtime data during a labeling job

Index	Field Alias	Field Type	Value	Format	X	Y	Attributes
1	1	Text	ABCD1234567890xyz	Droid Mono Bold	100	220	Point size=5; Horizontal scaling=75;
2	2	Barcode	ABCD1234567890xyz	PDF417	150	30	Row height=30; Narrow bar width=10.0 (0.25); Symbol aspect ratio=8; Error level=Default;

Label Editor

ABCD1234567890xyz

↑ABCD1234567890xyz,

Overview

Template 9 features the PDF 417 symbology, which can encode the most data on this size label. To fit the same amount of data in the text field that can be encoded in the barcode, the text field is small and compacted horizontally.

Specs

Maximum data: 58 numerals or 41 alpha characters (The maximum alphanumeric length depends on the character mix.)

Design features

- PDF 417 can encode large amounts of data.
- The narrow bar width used in this template provides good readability while allowing a large amount of data to be encoded.
- In compliance with recommended practices, the format features a row height at least 3 times the narrow bar width.
- The symbol aspect ratio is set so the symbol will stretch across the label and allow space below the barcode for text.
- The format uses the printer's default error level of 0.
- Generous margins are provided on both the right and left of the barcode.
- A blank margin above the barcode allows for 0.76-mm (0.030-in) vertical print drift.
- The space below the symbol will vary depending on the amount of data encoded. The example shows the maximum data length, while still maintaining a 0.51-mm (0.02-in) margin to separate the text and the barcode.
- The Droid Mono Bold font offers consistent character spacing, discernible characters, and a modern look.
- The font size is small to fit the available space, but is still legible.
- The text field is scaled horizontally to match the data that can be encoded in the barcode.
- The text has a generous margin on the left. The margin on the right will vary depending on number of characters.
- The text field is left-justified to allow for the longest possible string in the available space.
- A blank margin below the text allows for some vertical print drift.

In This Guide

This guide includes procedures for installation, setup, operation, and maintenance of the Microplate Barcode Labeler.

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