

# Automated Plate Labeling

# **Protocol Guide**

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**Original Instructions** 



Agilent Technologies

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Automated Plate Labeling Protocol Guide

# Automated Plate Labeling Protocol Guide

This guide contains the following topics:

- "About this guide" on page 2
- "Protocol description" on page 4
- "Before you start" on page 4
- "Starting up the workstation" on page 8
- "Opening the protocol" on page 10
- "Setting up the protocol" on page 13
- "Running the protocol" on page 19
- "How to return to the Applications Library" on page 24



# About this guide

This guide describes how to run the Automated Plate Labeling protocol using an Agilent G5590A BenchCel Workstation that includes the Microplate Labeler. This guide describes how to open the protocol and run it using the BenchCel Workstations software. For details on the task parameters or how create a different protocol, see the *VWorks Automation Control User Guide*.

#### Assumptions

This guide assumes the following:

- The Agilent G5590A BenchCel Workstation with Microplate Labeler has been installed and is operating correctly.
- The device teachpoints have been set and verified.
- You are familiar with the devices in the workstation and the VWorks Automation Control software.

#### Safety information

Ensure that you are properly trained in:

- General laboratory safety
- The correct and safe operation of the workstation
- Emergency stops

For general safety precautions, intended product use statement, and the list of safety labels, see the *Automation Solutions Products General Safety Guide*.

For detailed safety information, see the *BenchCel Microplate Handler User Guide* and the *Microplate Labeler User Guide*.

#### Related user guides and where to find them

You should use this guide in conjunction with the following guides:

- Automation Solutions Products General Safety Guide. Provides general safety information and describes potential safety hazards that you might encounter when using Agilent Automation Solutions products. A copy of this safety guide is included with your shipment.
- *BenchCel Microplate Handler User Guide*. Contains the safety guidelines and describes the installation, setup, operation, and maintenance procedures for the BenchCel Microplate Handler.
- *Microplate Labeler User Guide*. Describes the setup, operation, and maintenance procedures for the Microplate Labeler.
- *VWorks Automation Control User Guide*. Describes how to create, run, import, and export protocols.
- *VWorks Automation Control Setup Guide*. Explains how to define labware, specify pipetting speed and accuracy, manage labware in storage, and manage user accounts.

You can access these guides in the **Literature Library** page of the BenchCel Workstations software interface.

About this guide

a contract a	re Library	Agilent Technologie
General Too	ls	Applications Library
Open	BenchCel Microplate Handler User Guide	
Open	Bravo Platform User Guide	Full Screen on/off
Open	PlateLoc Sealer User Guide	
Open	Microplate Labeler User Guide	
Open	Centrifuge and Loader User Guide	
Open	VWorks Knowledge Base	
Open	Contact Agilent Automation Solutions	
Protocol Gu	ides Plate Sealing	
Open		
Open	Plate Labeling	
	Plate Labeling Plate Centrifugation	
Open		

You can find the user guides for all the Automation Solutions products in the VWorks knowledge base. You can open the knowledge base in the following ways:

- In the BenchCel Workstations software, go to the Literature Library page, and then click **Open** for the **VWorks knowledge base**.
- Within the VWorks software, select Help > Knowledge Base or press F1.
- From the Microsoft Windows 10 All Apps menu, select Agilent Technologies > VWorks Knowledge Base.

You can also find these guides in the online VWorks knowledge base at www.agilent.com/chem/askb.

# **Protocol description**

**Plate Labeling protocol.** The Plate Labeling protocol automatically prints and applies barcode labels on up to n microplates in a single automated run.

*Note:* The number (n) of microplates that a protocol can process depends on the number of labware racks on the BenchCel Microplate Handler. Depending on the model, the BenchCel Microplate Handler can have two, four, or six labware racks (BenchCel 2R, 4R, or 6R model).

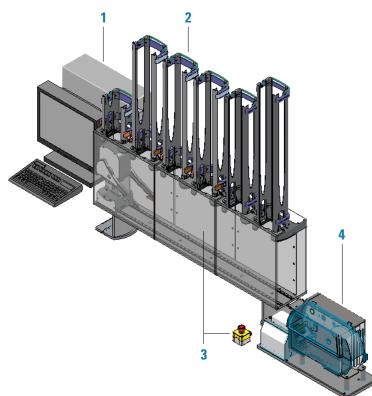
### **Before you start**

#### **Hardware requirements**

The following figures and table describe the workstation and the components required for the protocol. The BenchCel Microplate Handler in the workstation can be a BenchCel 2R, 4R, or 6R model.

**IMPORTANT** If your workstation includes additional devices and you want to use this protocol, the VWorks device file that is linked to the protocol must be edited to include all the workstation devices before you can run the protocol successfully. For instructions on how to modify a device file and link to the protocol, see the *VWorks Automation Control User Guide*.

Figure G5590A BenchCel Workstation BenchCel 6R with Microplate Labeler



ltem	Name	Description	See
1	Computer and monitor	The controlling computer that runs the VWorks Automation Control software.	VWorks Automation Control User Guide
2	BenchCel Microplate Handler	<ul> <li>The device that stores stacks of labware and moves labware to and from the other devices in the workstation. Depending on the BenchCel model, two, four, or six labware racks can be installed on the stackers.</li> <li>BenchCel 2R has two stackers for labware racks.</li> <li>BenchCel 4R has four stackers for labware racks.</li> <li>BenchCel 6R has six stackers for labware racks.</li> </ul>	BenchCel Microplate Handler User Guide
		The labware rack height can be 250-, 660-, or 860-mm.	
3	Safety equipment	Emergency-stop pendants and shields protect operators from moving-parts hazards.	BenchCel Microplate Handler User Guide
4	Microplate Labeler	The device that automatically prints the barcode labels and applies them to the microplate. The primary components include a label printer, an applicator, and a plate stage.	Microplate Labeler User Guide

#### Table Components of the G5590A BenchCel Workstation BenchCel with Microplate Labeler

### **Software requirements**

The minimum software requirements for running the protocol are as follows:

- Microsoft Windows 10 64-bit operating system
- VWorks Automation Control software 13.1

**IMPORTANT** VWorks Administrator or Technician privileges are required to make any changes to the protocol task settings.

• BenchCel Workstsations software 1.0

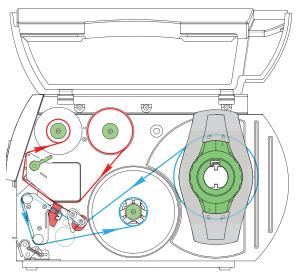
Before you start

The BenchCel Workstations software includes the device profiles for connecting to your devices and the files required to run the BenchCel Workstation protocols.

#### **Media requirements**

Ensure that the printer on the Microplate Labeler has sufficient ribbon and labels loaded for the number of labels you are applying in the protocol.

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



- If you are loading ribbon and labels for the first time, see the *Media Loading Guide* included in the Agilent Microplate Labeler Media Kit for instructions.
- If you are replacing used ribbon and label rolls, see the *Microplate Labeler User Guide* for the printer cleaning procedure before you load the new ribbon and label rolls.

#### About the label format

By default, this protocol uses the format 1 label template, shown in the following figure.

Figure Format 1 template: Code 128 symbology above a small-font human-readable text field



This label format is only one of the ready-to-use templates (format 1–9) that are available for you to use on the Microplate Labeler. For a description of the different templates or instructions on how to create your own label format in Microplate Labeler Diagnostics, see the *Microplate Labeler User Guide*.

#### Labware requirements

The labware that you use must have a corresponding labware definition in the VWorks software. By default, the Plate Labeling protocol specifies the 96-well Greiner 655101 microplate. The VWorks software includes over 70 labware definitions. If the labware that you want to label does not have a matching labware definition, you create one using the VWorks Labware Editor.

**CAUTION** Using labware that has not been defined in the Labware Editor can cause a collision, resulting in equipment damage. Ensure that the labware definition matches the labware that you use for the protocol.

#### To open the Labware Editor:

- 1 In the VWorks software, click **Tools > Labware Editor** on the menubar.
- **2** The Labware Editor opens.
- **3** In the Plate Properties tab, notice that the Plate Handling area contains the Lower plate at Microplate Labeler check box.

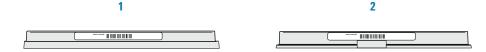
#### *Figure* Labware Editor window

ase select a labware entry from the below in order to view and edit its	Labware-Entry Genera	al Properties			Base Class	
operties.	Description 96	Greiner Polystyrene C	lear Round Well, Fl	at Bottom		
					<ul> <li>Microplate</li> </ul>	
Costar 3961 PP 2ml assay block 🔨					<ul> <li>Filter plate</li> </ul>	
Deep Well PP Sqr Well V Btm					O Reservoir	
Eppendorf 30129300, PCR, Full Eppendorf 96/1000_U-bottom,					-	
Eppendorf 96/500_V-bottom, C					O Tip Wash Station	
Eppendorf Twin.tec half skirt P					O Pin tool	
Eppendorf Twin.tec half skirt P					O Tip box	
Eppendorf Twin.tec PCR					•	
Eppendorf Twin.tec PCR in Red					O Lid	
Greiner 650201, U-Bottom Stan					<ul> <li>Tip trash bin</li> </ul>	
Greiner 650201_U-Bottom, Clea	Manufacturer part	t number 655101		Number of wells 96	O AssavMAP cartridge rack	
Greiner 650207, U-Bottom, Whi					O Abbayment cardinage rack	
Greiner 650207_U-Bottom, Whi						
Greiner 651201_V-Bottom, Clea Greiner 651209 Black V btm						
Greiner 652270, PCR, Full Skirt				Plate Handling		
Greiner 655101 PS Clr Rnd We	Robo	t gripper offset (mm)	0.00000			
Greiner 675801, Half Area, Flat				Lower plate at Microplate	e Labeler	
Matrix open reservoir movable		Thickness (mm)	14.61000		a second s	
Nunc 269620, Flat Bottom, Poly			11.01000	Can mount		
Nunc Deep Well 1 mL	Sta	cking thickness (mm)	13,10000			
Nunc Deep Well 1 mL using Silv		····· · · · · · · · · · · · · · · · ·	15.10000	Can be mounted		
Red PCR Insert + Bio-Rad PCR, Red PCR Insert + Eppendorf 30		Lid depth (mm)	0.00000			
Red PCR Insert + Eppendort 30 Red PCR Insert + Greiner 6522		De seper (rini)	0.00000	Mandaura Dahat Haadiisa Caasa		
Seahorse Storage Plate 2mL Sc				Maximum Robot Handling Spee	ed	
V11 11961.001 Autofilling Micro		Can be sealed?				
V11 LT200 Tip Box 06880.002				O Slow		
V11 LT250 Tip Box 19477.002	S	ealed thickness (mm)	0.00000			
V11 LT250 Tip Box Filtered				O Medium		
V11 LT250 Tip Box Standard	Sealed sta	cking thickness (mm)	0.00000			
V11 Manual Fill Reservoir				Fast		
Waters 186005837, Clear PolyF AM 250 µL Tip Loading Station						
AM 250 µL TIP Loading Station AM Cartridge Rack and Receiver		Can have lid?		Miscellaneous		
AM Cartridge Seating Station		idded thickness (mm)	0.00000			
AM Receiver Plate		idded allowless (mill)	0.00000	Length of filter 0.00000		
>	Liddod eta	cking thickness (mm)	0.00000	tip/pin tool		
	Liudeu sta	icking unickness (mm)	0.00000	Filter channel 0.00000		
New labware entry	10	d resting height (mm)	0.00000	resting depth		
,	LIC	a resung neight (mm)	0.00000			
Save changes		eparture height (mm)	0.00000	Requires insert		
	LIG G	eparture neight (mm)	0.00000	None	-	
Save changes as						
Rename labware entry						

- To use the top position (default) of the plate stage for this labware, clear the check box.
- To lower the plate stage for this labware, select the check box.

Starting up the workstation

If the labware has a tall skirt (1) or has a raised surface on the sides (2), you can specify that the Microplate Labeler use the bottom position (or lower the stage) during the run so that the label can be applied above the skirt or raised surface.



The two vertical plate stage positions are set mechanically. To adjust the plate stage height on the Microplate Labeler, see the *Microplate Labeler User Guide* for instructions.

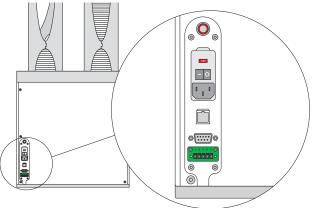
For detailed instructions on how to create labware definitions, see the *VWorks* Automation Control Setup Guide.

### Starting up the workstation

#### To start up the workstation:

- **1** Start up the BenchCel Microplate Handler as follows:
  - **a** Position the BenchCel robot head underneath a stacker, and place the gripper arms to the right facing the Microplate Labeler.
  - **b** Turn on the BenchCel air supply.
  - **c** Turn on the BenchCel power.

#### Figure BenchCel rear panel



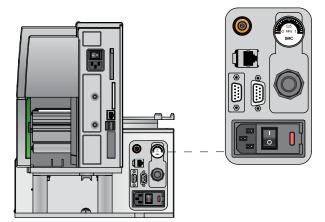
**d** Wait for the BenchCel head to finish the homing routine.

#### To start up the Microplate Labeler

- **1** Turn on the air supply.
- **2** On the rear of the Microplate Labeler, check the air pressure gauge. Verify the air pressure is set within the following range:

0.55 MPa (80 psi) to 0.58 MPa (85 psi)

Figure Microplate Labeler connection panel



- **3** Verify that the communication cable and power cord are connected, but do not turn on the power yet.
- **4** If you are using an Ethernet switch, turn on the power to the Ethernet switch.
- **5** On the Microplate Labeler connection panel, press the power switch to the **on** (|) 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.

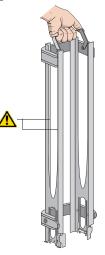
**IMPORTANT** Ensure that the power switch on the printer remains in the on (|) position.

**IMPORTANT** Make sure the label formats that you plan to use are uploaded to the printer on the Microplate Labeler. For instructions, see the *Microplate Labeler User Guide*.

- **6** Turn on the computer and monitor. Wait for the Microsoft Windows operating system to finish starting up.
- 7 At the BenchCel Microplate Handler, install the labware racks on the stackers. See the *BenchCel Microplate Handler User Guide*.

**IMPORTANT** Make sure the BenchCel power and compressed air are turned on before you install or uninstall a labware rack.

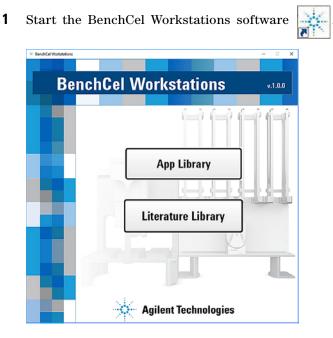
Figure Labware rack, front-load



### **Opening the protocol**

**IMPORTANT** Ensure that the VWorks software is closed before you start the BenchCel Workstations software.

#### To open the protocol:



2 Click App Library. The VWorks software starts.

**3** When the **User Authentication** dialog box opens, type your VWorks user name and password, and then click **OK**.

Please log in:	
User name:	ОК
Password:	Cancel

**4** In the **Applications Library** form, click **Full Screen ON/OFF** to change the scale of the form display within the VWorks window so that the menubar and the Control and Standard toolbars are visible, as the following figure shows.

Figure Applications Library form displayed with Full Screen off

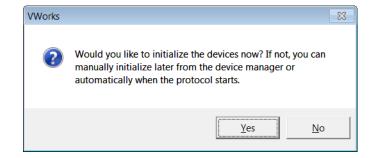
🐮 Works - [Applications Library.WForm] –	o x
Ele f.dt View Icols Window Help	- 0 ×
📄 - 🤌 🖟 🕼 🐰 🖒 💼 🚡 🤣 🖉 🍂 💂 🗞 Log out 🏪 Compile 🔊 Start 🕕 Pause all 🔅 Simulation is off 🞉 Diagnostics 💂	
🗈 Applications Library.WWForm 🔁 BenchCel_&R_Labeler System.pro	₹ ×
Applications Library	gies
Literature Library	
BenchCel 2R App BenchCel 4R App	
BenchCel 6R App Plate Sealing Full Screen ON/OFF	
BenchCel 2R App BenchCel 4R App	
BenchCel 6R App Plate Labeling	
BenchCel 2R App BenchCel 4R App Plate Centrifugation	
BenchCel 6R App	
BenchCel 2R App BenchCel 4R App Plate Replication	
BenchCel 6R App	
Orientation Serial Dilution	
Main Log Main Log Progress	ø ×

*Note:* If the toolbars are not displayed in the VWorks window, right-click in the window, and then select the corresponding toolbar from the shortcut menu.

**5** In the **Plate Labeling** area of the **Applications Library** form, click the button that corresponds to your BenchCel stacker configuration: BenchCel 2R App, BenchCel 4R App, or BenchCel 6R App.

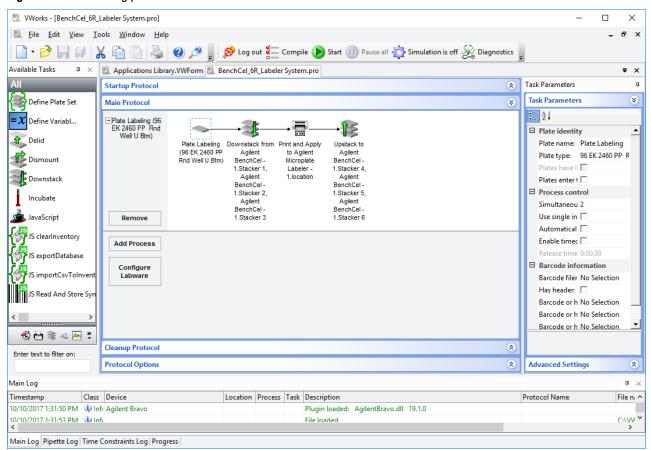
**Opening the protocol** 

6 When the following VWorks initialization message appears, click Yes.



The initialization process establishes communication with the BenchCel Microplate Handler and Microplate Labeler and homes the devices. The Plate Labeling protocol opens in the VWorks window.

Figure Plate Labeling protocol in the VWorks window



### Setting up the protocol

#### **Before you start**

**CAUTION** The label format selection and field information are saved with the protocol. If the label formats on the Microplate Labeler printer are changed, initializing the device will overwrite the information in the protocol. For example, suppose you selected a label format in the protocol called MyFormat. But, later, MyFormat is deleted from the printer. The next time you initialize the device and open the protocol, MyFormat will not appear in the protocol. Ensure that the label formats you are using are uploaded to the Microplate Labeler printer before you set the protocol task parameters.

**IMPORTANT** VWorks Administrator or Technician privileges are required to make any changes to the protocol task settings.

#### Specifying the labware and the stackers

#### To specify the labware and the stackers:

- 1 In the protocol, verify that the correct labware type is selected:
  - a In the Main Protocol area, click the Plate Labeling icon.
  - **b** In the **Task Parameters** pane, locate **Plate type**, and verify that the selection is correct.

If the wrong labware is selected, click the  $\ensuremath{\textit{Plate type}}$  list and select the labware that you are using.

Startup Protocol					۲	Task Parameters	
Main Protocol					۲	Task Parameters	
<ul> <li>Plate Labeling (96 Greiner 655101</li> </ul>			. =	. îk	- ^	Ž↓	
PS Cir Rnd Well Flat Btm)	Plate Labeling	Downstack from	Print and Apply	Upstack to		Plate identity Plate name:	Plate Labeling
	(96 Greiner 655101 PS Clr	Agilent BenchCel -	to Agilent Microplate	Agilent BenchCel -		Plate type:	96 Greiner 655101 PS Clr Rnc 👻
	Rnd Well Flat	1.Stacker 1,	Labeler -	1.Stacker 4,		Plates have lids:	
	Btm)	Agilent BenchCel -	1.location	Agilent BenchCel -		Plates enter the syste	m seale
		1.Stacker 2,		1.Stacker 5,		Process control	
		Agilent BenchCel -		Agilent BenchCel -		Simultaneous plates:	2
Remove		1.Stacker 3		1.Stacker 6		Use single instance o	f plate:
Add Process					* *	<b>Plate type:</b> The type of labware use	d
Protocol Options					۲	Advanced Settings	

**CAUTION** Using labware other than one that has been defined in the Labware Editor can cause a collision, resulting in equipment damage. Ensure that the Plate type setting matches the labware that you use for the protocol.

- **2** Specify the BenchCel stackers that contain the labware to be labeled, as follows:
  - **a** In the Main Protocol area, click the Downstack task.
  - **b** In the **Task Parameters** pane, click **Device Selection**, and verify that the selection is correct.

- **Devices involved in** area lists the stackers that hold the labware to be labeled. To remove a stacker from the list, double-click the stacker name.
- **Devices available to perform task** area lists the stackers that are not used in the Downstack task. To move a stacker from this list to the **Devices involved in** list, double-click the stacker name.

Startup Protocol					۲	Task Parameters
Main Protocol					۲	Task Parameters 🔅
-Plate Labeling (96						Device Selection 😵
Greiner 655101 PS CIr Rnd Well Flat Btm)	Plate Labeling (96 Greiner 655101 PS Cir Rnd Well Flat Btm)	Downstack from Agilent BenchCel - 1.Stacker 1, Agilent BenchCel - 1.Stacker 2, Agilent BenchCel - 1.Stacker 3	Print and Apply to Agilent Microplate Labeler - 1.location	Upstack to Agilent BenchCel - 1.Stacker 4, Agilent BenchCel - 1.Stacker 5, Agilent BenchCel - 1.Stacker 6		Devices involved in Aglient BenchCel - 1.Stacker 1 Aglient BenchCel - 1.Stacker 2 Aglient BenchCel - 1.Stacker 3 Use later Devices available to perform task: Aglient BenchCel - 1.Stacker 4* Aglient BenchCel - 1.Stacker 5* Aglient BenchCel - 1.Stacker 5*
Add Process					¥	
Cleanup Protocol					۲	
Protocol Options					۲	Advanced Settings

*Figure* Downstack task example for a BenchCel 6R

- **3** In the protocol, specify the empty BenchCel stackers where the BenchCel robot will store the labeled labware, as follows:
  - a In the Main Protocol area, click the Upstack task.
  - **b** In the **Task Parameters** pane, click **Device Selection**, and verify that the selection is correct.
    - **Devices involved in** area lists the empty stackers that the BenchCel robot will use for upstacking the labeled labware. To remove a stacker from the list, double-click the stacker name.
    - **Devices available to perform task** area lists the remaining stackers that are not involved in the task. To move a stacker from this list to the **Devices involved in** list, double-click the stacker name.

Figure Upstack task example for a BenchCel 6R

	<ul> <li>Task Parameters</li> </ul>	ť
Aain Protocol	Task Parameters	*
Plate Labeling (96 Greiner 655101 PS Cr Pnd Well Rat Btm) <ul> <li>Plate Labeling (96 Greiner 655101 PS Cr</li> <li>BenchCel -</li> <li>Microplate</li> <li>BenchCel -</li> <li>I.Stacker 4, Btm)</li> <li>Aglient</li> <li>Labeler, 2, Aglient</li> <li>Labeler, 1.</li> <li>Labeler, 2, Aglient</li> <li>Labeler, 2, Aglient</li> <li>Stacker 4, Btm)</li> <li>Aglient</li> <li>Labeler, 2, Aglient</li> <li>Stacker 5, Aglient</li> <li>Aglient</li> <li>Aglient</li> <li>Aglient</li> <li>Aglient</li> <li>Aglient</li> <li>Aglient</li> <li>Stacker 5, Aglient</li> <li>Aglient</li> <li>Aglient<td>Device Selection Devices involved in Agient BenchCel - 1.Stacker 4 Agient BenchCel - 1.Stacker 5 Agient BenchCel - 1.Stacker 6 Devices available to perform task: Agient BenchCel - 1.Stacker 1* Agient BenchCel - 1.Stacker 3* Dynamically-assigned</td><td>Use earlier Use later</td></li></ul>	Device Selection Devices involved in Agient BenchCel - 1.Stacker 4 Agient BenchCel - 1.Stacker 5 Agient BenchCel - 1.Stacker 6 Devices available to perform task: Agient BenchCel - 1.Stacker 1* Agient BenchCel - 1.Stacker 3* Dynamically-assigned	Use earlier Use later
Add Process		
Protocol Options	Advanced Settings	

- 4 To save any changes, click **File > Save** on the VWorks menubar.
- **5** At the BenchCel Microplate Handler, fill the labware racks in the specified Downstack stackers with the labware to be labeled. Verify that the Upstack stackers are available for storing the labeled labware.

**CAUTION** Improperly seated labware can cause a hardware collision, resulting in equipment damage. Ensure that all labware are properly seated and in the correct orientation within the labware racks.

For instructions on how to fill the labware racks, see the *BenchCel Microplate Handler User Guide*.

#### Specifying the Print and Apply task parameters

For each side of the labware, you select a label format and specify the information that will substitute for the text and barcode fields in the label format.

#### To specify the Print and Apply task parameters:

- 1 In the Main Protocol area, click the Print and Apply task.
- 2 In the Task Parameters pane, verify that the Format selection is correct for the South side of the labware.

*Note:* The Device Selection area must specify the device for the task before you can enter the task parameters. For this protocol, the Microplate Labeler device has already been selected.

Startup Protocol					۲	Task Parameters		_
Main Protocol					۲	Task Parameters		(
Plate Labeling (96 Greiner 655101 PS Cir Rnd Well Flat Btm)	Plate Labeling	Downstack from	Print and Apply	Upstack to	·	2↓ □ South Format:	1	
	(96 Greiner 655101 PS Clr	Agilent BenchCel -	to Agilent Microplate	Agilent BenchCel -		1:	[STATIC:Source ][COUNTER:1:1:3:1:0]	
	Rnd Well Flat	1.Stacker 1,	Labeler -	1.Stacker 4,		2:	[STATIC:Source ][COUNTER:1:1:3:1:0]	
	Btm)	Agilent BenchCel -	1.location	Agilent BenchCel -		🗆 West		
		1.Stacker 2,		1.Stacker 5,		Format:	Use from South	
		Agilent BenchCel -		Agilent BenchCel -		North		
Remove		1.Stacker 3		1.Stacker 6		Format:	Use from South	
						🗆 East		
Add Process						Format:	Use from South	
					× 1			_
leanup Protocol					۲	Device Selection		(
Protocol Options					۲	Advanced Setting	5	(

Figure Print and Apply task showing default task parameters

By default, this protocol uses Format 1. If you want to select a different format, click the **Format** box, and select from the list:

• **Name or number.** You can select from 9 templates (1-9), included with the Microplate Labeler, or any other label formats that you have created in Microplate Labeler Diagnostics.

For details on how to create and edit label formats, see the *Microplate Labeler User Guide*.

If you do not see a list of formats, make sure the formats are uploaded to the printer, and ensure the Microplate Labeler device is initialized.

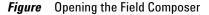
- **Use from** *<side>*. If you are using the same label on multiple sides, you can define the format for one side and then reference that side for the other sides.
- None. Indicates no label will be applied on the given side.

Setting up the protocol

- **3** Specify the information that you want to print in each field associated with the selected Format.
  - **a** To edit a field, click the field, and then click the <u>button</u> button that appears. The Field Composer dialog box opens. See the following figure.
  - **b** Use the Field Composer to specify the information to print for the given format field.

Agilent recommends that you include the same information in both the human-readable text field and the field that contains the barcode symbol.

Note: The number of fields vary depending on the label format.



Task Parameters		۲ ا	Field Composer	
<b>: 2</b> ↓			Tools	Field Value
South			DATE	
Format:	1			불리역
1:	[STATIC:Source ][COUNTER:1:1:3:1:0]	• • • • •		
2:	[STATIC:Source ][COUNTER:1:1:3:1:0]			
West				Properties
Format:	Use from South			
□ North				
Format:	Use from South			Static Text
🗉 East			DISK	Source
Format:	Use from South		영태성	
Task Description				
Task number:	2			
Task description:	Print and Apply			
Use default task description:			22	
1:			6.0	
			1 4 5	
			U U	
			T	
			-	
			080422	OK

For details on how to use the Field Composer, see the Print and Apply topic in the *VWorks Automation Control User Guide*.

4 To save any changes, click File > Save on the VWorks menubar.

#### **Format 1 description**

The following table and figures describe the default settings in the protocol for Format 1, which has 2 fields:

Format 1 fields	Description
1	Specifies the information that will be encoded in the barcode symbol.
	Click the field, and then click the $\overline{\cdots}$ button that appears. The Field Composer dialog box opens. Use the Field Composer to specify the information to print for the barcode symbol.
2	Specifies the human-readable text that appears below the label. Click the field, and then click the $\overline{\cdots}$ button that appears. In the Field Composer dialog box, specify the information to print for the barcode symbol.

For Format 1 in this protocol, the Field Composer has only two types of Field Values defined by default: Static Text and Counter.

 Table
 Field Composer tools and values for Format 1(default)

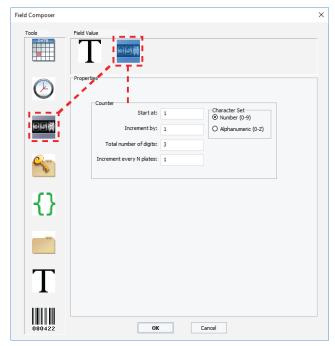
Format 1 tools, default	Description and default value
Static Text	Prints the text that you want to appear on every label. Default value: <i>Source</i>
	To change the default text:
	Click the $oldsymbol{T}$ icon at the top of the Field Value area. In the
	Properties area, type the new text in the Static Text box.
Counter	Prints a numeric or alphanumeric value that can be incremented.
	Default value: 1:1:3:1:0
	To change the default values:
	Click the <b>SET</b> icon at the top of the <b>Field Value</b> area. Set the
	following in the <b>Properties</b> area:
	• <i>Character Set.</i> The option to use either numeric or alphanumeric characters.
	• Start at. The starting value.
	• Increment by. The amount by which the value increments.
	• <i>Total number of digits.</i> The total number of digits or characters, including leading 0s.
	• <i>Increment every N plates.</i> The increment value. For example, 1 increments the value every microplate.

You can delete the Static Text and Counter tools from the Field Value area in the Field Composer and use other tools from the Tools area instead. For a detailed description of the Field Composer tool options, see the Print and Apply topic in the *VWorks Automation Control User Guide*.

Field Composer		×
Tools		_
$\triangleright$	Properties Static Text	
허더더	Source	
8		
{}		
T		
080422	OK Cancel	

Figure Field Composer displaying default information for Static Text field

Figure Field Composer displaying default information for Counter field



### **Running the protocol**

#### **Before you start**

**CAUTION** A collision can occur if an object is placed in the path of the BenchCel gripper. To prevent potential equipment damage, ensure that the path is clear of objects, such as extra labware, that could cause a potential collision.

#### About performing a mock run (optional)

**IMPORTANT** Always perform a mock run to verify that the Microplate Labeler plate stage positions are correct for the labware you are processing, and that the label locations on the labware are correct.

You prepare for a mock run the same way you would prepare for a real protocol run, except that you use empty labware for a totally dry run.

#### Starting and monitoring the protocol run

#### To start and monitor the protocol run:

**1** Compile the protocol and troubleshoot any errors as follows:

**a** In the **VWorks** window, click **Compile** on the Control Toolbar. During the compiling process, the software reports errors found in the protocol and displays the errors in the Main Log area at the bottom of the VWorks window.

*Note:* The software automatically compiles the protocol when you start a run.

**b** Review the error and warning messages in the Main Log. You should fix all the errors. You can choose to ignore some of the warnings.

#### 1 Automated Plate Labeling Protocol Guide

**Running the protocol** 

🗒 VWorks - [BenchCel_6F	? Labeler Sustem nrn]	- 🗆 X
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	Icols 🛛 Window Help 🔏 👔 🤌 Log out 🚝 Compile 🐌 Start 🕕 Pause all 🔅 Simulation is off 🎉 Diagnos	
Available Tasks $\mp$ $\times$	Applications Library.VWForm BenchCel_6R_Labeler System.pro	₹ ×
All	Startup Protocol (8)	Task Parameters
Define Plate Set	Main Protocol 😵	Task Parameters 😵
Define Variabl     Define Variabl     Delid     Dismount     Downstack     Incubate     JavaScript     JS clearInventory     JS clearInventory     JS caportDatabase     JS seportDatabase     JS Read And Store Syr     Se    Second Store Syr     Second Store		24 Plate identity Plate name: Plate Labeling Plate type: 96 EK 2460 PP R Plates have I Plates enter I Process control Simultaneou 2 Use single in Automatical Enable time C Release time 0:00:30 Barcode information Barcode or h No Selection D D D D D D D D D D D D D D D D D D D
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10/10/2017 4:22:11 PM 🏼 🌵	Infi Compile complete with 0 errors and 0 warnings	~
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Main Log Pipette Log Tim	e Constraints Log   Progress	

2 In the VWorks window, click Start on the Control Toolbar.

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The Run Configuration Wizard opens.

BenchCel_6R_Labeler System.pr	ro - Run Configuration Wiza 🗙			
Run protocol this many times:     I     Run protocol until manually aborted				
<u>C</u> ancel << <u>B</u> ack	Next >> Finish			

The Run Configuration Wizard allows you to:

- Specify the number of times to run the protocol.
- Schedule the run to start. You can start the run:
  - As soon as possible

- On a specific date and at a specific time
- Specify the starting barcode, if applicable.

This feature requires a barcode scanner.

- Type notes about the protocol.
- **3** Follow the instructions in the wizard and click **Next** or **Finish**, as applicable.

**CAUTION** If you select the As soon as possible option, the protocol can start to run immediately after you complete the configuration wizard. Before you click Finish, verify that the system is set up and the protocol is ready to run.

**4** When the **System Setup** message appears, verify that the correct stackers are designated for the labware to be labeled, and then do one of the following:

Figure Example of System Setup message for BenchCel 4R

BenchCel 4R Stacker#1 and #2 are fo	or Source Plates

- If the setup is correct, click **Continue** to start the protocol.
- If the setup is not correct, make the required adjustments, and then click **Continue** in the **System Setup** message.
- If the wrong labware type is loaded in a BenchCel stacker, click **Pause** and **Diagnose**.

In the **Scheduler Paused** dialog box that opens, click **Diagnostics**, and open BenchCel Diagnostics to release the labware. After resolving the problem, click **Continue** in the **Scheduler Paused** dialog box.

To monitor the progress of the run, check the  $\ensuremath{\text{Progress}}$  tab at the bottom of the VWorks window.

#### 1 Automated Plate Labeling Protocol Guide

Running the protocol

#### Figure Progress tab in the VWorks window

🐘 VWorks - [BenchCel_6R_Labeler	System.pro]		- 0	×	
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📄 🗣 🎅 💭 🙀 🔏 🛅 📄 🌺 🥝 🎤 📕 🤣 Log out 🏣 Compile 🌔 Start 🕕 Pause all 👰 Simulation is on 🎉 Diagnostics 💂					
Available Tasks $\Psi \times$	I Plate Labeling_6R.dev BenchCel_6R_Labeler System.pro			₹ ×	
All	Startup Protocol	*	Task Parameters		
Define Plate Set	Main Protocol	۲	Task Parameters	۲	
E Define Variabl	Plate Labeling (96 Greiner 555101 PS Or Rnd Well Rat Btm) Plate Labeling Downstack from Print and Apply Upstack to	^	C 2↓ South Format: 1	<u> </u>	
Dismount Downstack	(96 Greiner Aglient to Agilent Agilent 655101 PS Cir BenchCel - Microplate BenchCel - Rnd Well Flatt 1.Stacker 1, Labeler - 1.Stacker 4, Btm) Agilent 1.location Agilent		1:         [STATIC:Source ][COUNTER:1:1:3:1:0]           2:         [STATIC:Source ][COUNTER:1:1:3:1:0]           D         West		
Incubate	BenchCel - BenchCel - 1.Stacker 2, 1.Stacker 5, Aglient Aglient BenchCel - BenchCel -		Format: Use from South		
JavaScript	Remove 1.Stacker 3 1.Stacker 6	-1	Format: Use from South	_	
🐔 📇 📚 🛶 🏊 mer All 😤	Add Process		Format: Use from South	-	
Enter text to filter on:	Configure	~			
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Progress				4 ×	
Protocol Elapsed Time Protocol Progress BenchCeL_6R_Labeler System.pro 00:00:01					
Main Log   Pipette Log   Time Constra Ready	Ints Log Progress Kunset Manager	-	a is loaged in		

At the end of the run, the BenchCel stacker grippers automatically release the labware so that you can unload the labware.

A protocol complete message appears.

### Pausing and continuing the run

#### *To pause and continue the run:*



The task currently in progress finishes before the protocol pauses. The Scheduler Paused dialog box opens.

Scheduler Paused				
<u>Bypass interlock</u>				
Continue				
Diagnostics				
Abort process				
Einish, no new plates				

2 When you are ready to resume the run, click **Continue** in the **Scheduler Paused** dialog box.

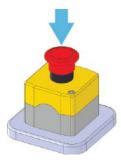
For details about the other options in the Scheduler Paused dialog box, see the *VWorks Automation Control User Guide*.

#### Stopping in an emergency

**CAUTION** You might not be able to resume a protocol after an emergency stop. Do not use an emergency stop to pause a run. To pause and continue a run, use the Pause button.

#### To stop in an emergency:

1 Press the red button on the emergency-stop pendant.



The Scheduler Paused dialog box opens.

Scheduler Paused				
Bypass interlock				
Continue				
Diagnostics				
<u>A</u> bort process				
Einish, no new plates				

#### To recover from an emergency stop:

1 If applicable, clear any obstacles from the Bravo Light Curtain. To reactivate the pendant, turn the red button clockwise. The spring-loaded button pops up.



How to return to the Applications Library

- **2** Remove any dropped labware from the workstation. Remove the labware from the BenchCel gripper.
- **3** In the Scheduler Paused dialog box, select the appropriate command. For details, see the *VWorks Automation Control User Guide*.

Depending on the state of the workstation when the emergency stop was activated, the run may not be recoverable.

### How to return to the Applications Library

#### To return to the Applications Library display:

In the VWorks window, click the **Applications Library.VWForm** tab at the top of the protocol area. The Applications Library form appears in the VWorks window, as the following figure shows.

From the Applications Library form, you can open a different protocol or display the Literature Library.

Figure VWorks window displaying the Applications Library form

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Agient Centrifuge		Literature Library
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Aglent Direct Drive Robo	late Sealing	Full Screen ON/OFF
Aglent Generic I/O Mod	J.	
Aglent Generic RS-2320		
Aglent Labware MnHub BenchCel 2R App BenchCel 4R App		
bendicei zk App	lata Labaling	
Agient Microplate Labele BenchCel 6R App	late Labeling	
Agent Phantom Robot		
BenchCel 2R App BenchCel 4R App		
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BenchCel 6R App	lato continugation	
Aplent Vertical Pipetting		
Microscan Barcode Read		
Plate Pad, Standard BenchCel 2R App BenchCel 4R App		
	late Replication	
BenchCel 6R App		
Enter text to filter on:	erial Dilution	
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