Agilent 2200 TapeStation System

User Manual

Agilent Technologies

Notices

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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.

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.

Contents

1 Introduction to the 2200 TapeStation System

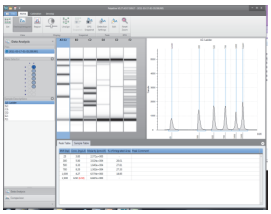
This chapter gives an introduction to the system

Overview of the System

The Agilent 2200 TapeStation system is a revolutionary automated platform for simpler, faster and more reliable electrophoresis. It is made up of three elements: a consumable tape (ScreenTape device), an instrument (the 2200 TapeStation instrument), and an Agilent Software package (2200 TapeStation Controller Software, and Agilent TapeStation Analysis Software). The system is very straightforward to use, simply place the sample tubes and ScreenTape device in to the 2200 TapeStation instrument and let it load, separate, image, analyze, and present the results.

Place ScreenTape device and some tips in the 2200 TapeStation instrument.

Place your samples in the 2200 TapeStation instrument and click **Start** on the 2200 TapeStation Controller Software.



View your analyzed results in around 1 min per sample.

This User Manual guides the operation of all ScreenTape assays, the 2200 TapeStation instrument, and software for the analysis of DNA, RNA, and protein samples. The contents of the ScreenTape system are detailed below.

Information pertaining to the 2200 TapeStation system can be found in:

- Technical Specification
- Agilent 2200 TapeStation Instrument Components
- Installing the System

Information pertaining to sample and ScreenTape device requirements can be found in:

- ScreenTape Device Architecture
- Operating Procedure

ScreenTape Device Architecture

Barcode:	The unique barcode tracks lane usage within each ScreenTape device and allows traceability of results.
Buffer chamber:	The buffer chamber is located at the top of the channel and contains optimised buffers for the effective separation of nucleic acid fragments or proteins.
Electrodes:	The integrated electrodes apply a current across the ScreenTape device and eliminate the need for any additional electrophoresis equipment.
Gel:	The gel contained within the ScreenTape device has been developed specifically to resolve nucleic acids or proteins.
ScreenTape device product details:	The information is unique to each ScreenTape device. This includes: ScreenTape assay type, product expiry date and a unique serial number.

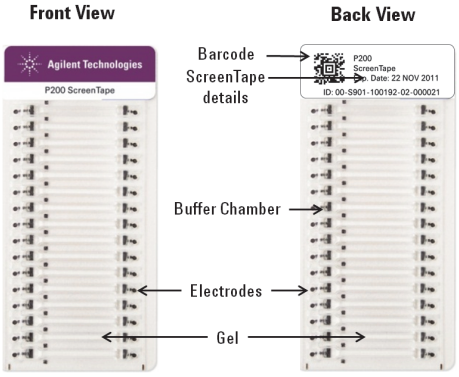


Figure 1 Example: P200 ScreenTape device

Agilent 2200 TapeStation Instrument Components

Lid:	The 2200 TapeStation instrument lid must be closed each time the 2200 TapeStation Controller Software is initialized, and whilst the instrument is in operation.
LED:	The LED will illuminate once the instrument is on. When the LED is flashing slowly, the instrument is in use and the lid should not be opened, rapid flashing indicates that the 2200 TapeStation instrument requires attention.
Sample Block:	There are 2 sample blocks provided that can either hold 0.2 mL sample tube strips or a 96-well plate.
Tip Holder:	The tip holder can accommodate up to 16 loading tips at any one time.
ScreenTape device:	The ScreenTape device must be placed into the holder with the barcode towards the front of the instrument, facing towards the right.
USB Socket:	The USB connector is inserted into the USB socket to link the laptop to the 2200 TapeStation instrument.
Power-cable socket:	The power cable must be connected to the 2200 TapeStation instrument and the relevant mains electricity outlet.

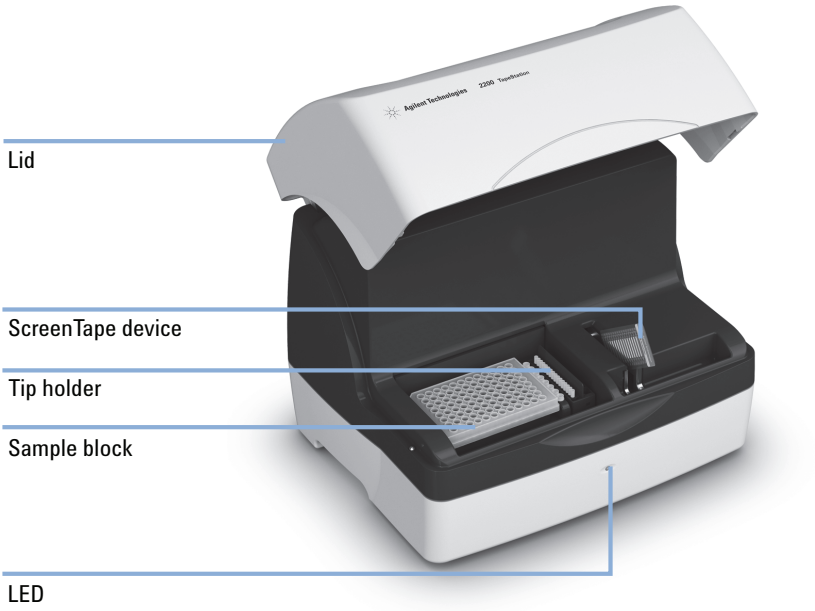


Figure 2 2200 TapeStation instrument (front view)

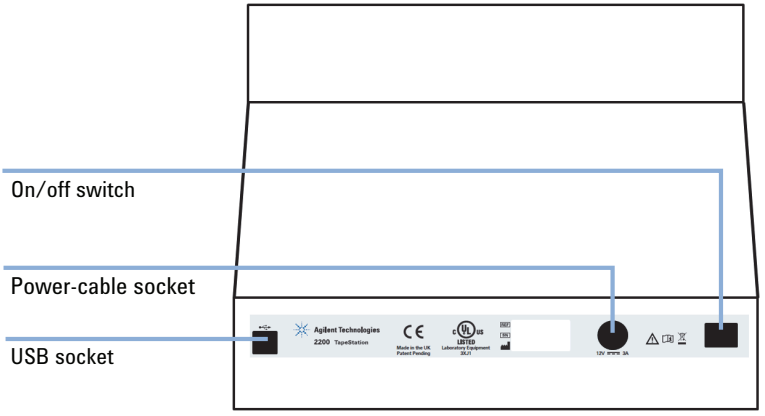


Figure 3 2200 TapeStation instrument (back view)

2 Specifications

This chapter provides information on specifications.

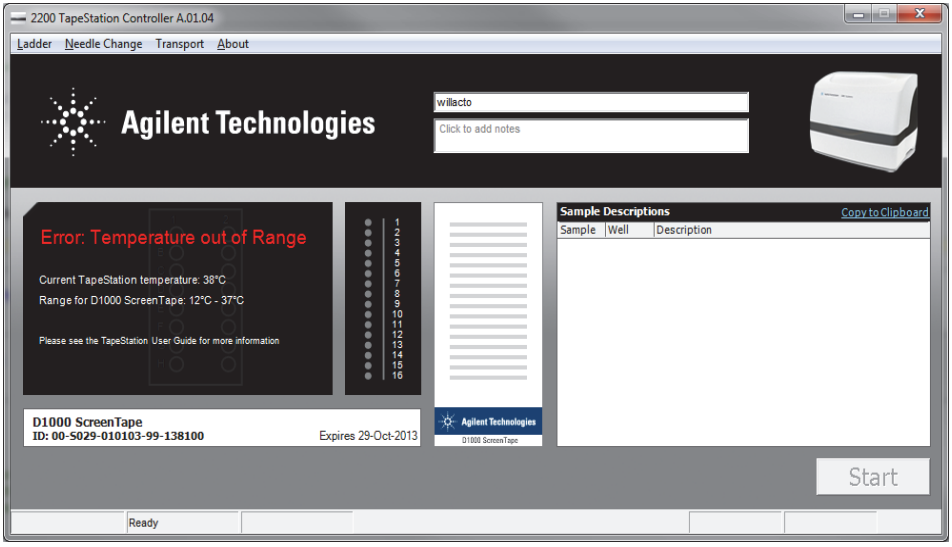
Technical Specifications

2200 TapeStation instrument	
Input voltage:	12 V DC
Power consumption:	40 W (VA)
Current:	3 A
Interface:	USB cable (PC comms.)
Instrument Housing:	UL94/VO rated flame retardant cast polyurethane
Dimensions:	400x 310x 310 mm
Weight:	12.5 kg
Power supply	
Input voltage:	100 – 240 V AC
Input frequency:	50 – 60 Hz
Phase:	1
Current:	0.45 – 1.1 A
Environmental conditions	
Optimal operating temperature	20 °C (68 °F).
Instrument operating temperature[1]	12 – 37 °C (54 – 99 °F) for D1000 ScreenTape assay 17 – 37 °C (63 – 99 °F) for High Sensitivity D1000 ScreenTape assay 15 – 30 °C (59 – 86 °F) for Genomic DNA, D5000 and High Sensitivity D5000 ScreenTape assays 14 – 30 °C (57 – 86 °F) for RNA and High Sensitivity RNA ScreenTape assays 10 – 33 °C (50 – 91 °F) for P200 ScreenTape assay

[1] Instrument operating temperature may be higher than ambient lab temperature, especially after prolonged use.

NOTE

If the instrument is out of the recommended temperature range for the ScreenTape assay selected, the following error message will appear in the software:



- If the quoted current temperature is above the specified range, please move the system out of direct sunlight and away from any windows. Check that any air conditioning is functioning.
- If the quoted current temperature is below the specified range, please allow the instrument to equilibrate to the ambient temperature, and avoid using in a cooled area.

ScreenTape Specifications

Specification (D1000 ScreenTape Assay)

Analytical Specifications	D1000 ScreenTape assay and reagents
Sizing Range	35 – 1000 bp
Typical Resolution	35 – 300 bp: 15 % 300 – 1000 bp: 10 %
Sensitivity[1]	0.1 ng/µL
Sizing Precision	5 % CV
Sizing Accuracy[2]	±10 %
Quantitative Precision	0.1 – 1 ng/µL: 15 % CV 1 – 50 ng/µL: 10 % CV
Quantitative Accuracy[3]	±20 %
Quantitative Range	0.1 – 50 ng/µL
Maximum sample buffer strength	20 mM KCl, 60 mM Phosphate Buffer, 60 mM Guanidine-HCl, 240 mM NaCl, 60 mM Acetate
Physical Specifications	
Analysis Time	16 samples: <20 min 96 samples: ≈100 min
Samples per consumable	16
Sample volume required	1 µL
Kit stability	4 months
Kit size	112 samples

1 signal-to-noise >3 (single peak)

2 Sizing Accuracy for electronic ladder: ±20%

3 Measured against 2100 Bioanalyzer system

Specification (High Sensitivity D1000 ScreenTape Assay)

Analytical Specifications	High Sensitivity D1000 ScreenTape assay and reagents
Sizing Range	35 – 1000 bp
Typical Resolution	35 – 300 bp: 15 % 300 – 1000 bp: 10 %
Sensitivity[1]	5 pg/µL
Sizing Precision	5 % CV
Sizing Accuracy[2]	±10 %
Quantitative Precision	15 % CV
Quantitative Accuracy[3]	±20 %
Quantitative Range	10 – 1000 pg/µL
Maximum sample buffer strength	7 mM KCl, 20 mM Phosphate Buffer, 20 mM Guanidine-HCl, 80 mM NaCl, 20 mM Acetate
Physical Specifications	
Analysis Time	16 samples: <20 min 96 samples: ≈100 min
Samples per consumable	16
Sample volume required	2 µL
Kit stability	4 months
Kit size	112 samples

1 signal-to-noise >3 (single peak)

2 Sizing Accuracy for electronic ladder: ±20%

3 Measured against 2100 Bioanalyzer system

Specification (D5000 ScreenTape Assay)

Analytical Specifications	D5000 ScreenTape assay and reagents
Sizing Range	100 – 5000 bp
Typical Resolution	400 – 5000 bp: 15 %
Sensitivity[1]	0.1 ng/µL
Sizing Precision[2]	5 % CV
Sizing Accuracy[2,3]	±10 %
Quantification Precision	0.1 – 1 ng/µL: 15 % CV 1 – 50 ng/µL: 10 % CV
Quantification Accuracy[4]	±20 %
Quantification Range	0.1 – 50 ng/µL
Maximum Sample Buffer Strength	250 mM KCl, 250 mM Tris-HCl, 125 mM NaCl, 50 mM Acetate, 25 mM $MgCl_2$, 25 mM BSA, 25 mM Guanidine-HCl
Physical Specifications	
Multiple ScreenTape (96 well) compatibility	Not compatible
Analysis Time	16 samples: <25 min
Samples per consumable	1 ladder + 15 samples
Sample volume required	1 µL
Kit stability	4 months
Kit size	112 samples/box

1 signal-to-noise >3 (single peak)

2 Determined using the D5000 Ladder as sample

3 Accuracy for run using single ScreenTape device

4 Measured against 2100 Bioanalyzer system

Specification (HS D5000 ScreenTape Assay)

Analytical Specifications	D5000 ScreenTape assay and reagents
Sizing Range	100 – 5000 bp
Typical Resolution	400 – 5000 bp: 15 %
Sensitivity[1]	5 pg/µL
Sizing Precision[2]	10 % CV
Sizing Accuracy[33]	±15 %
Quantification Precision	15 % CV
Quantification Accuracy[4]	±25 %
Quantification Range	10 – 1000 pg/µL
Maximum Sample Buffer Strength	25 mM KCl, 25 mM Tris-HCl, 12.5 mM NaCl, 5 mM Acetate, 2.5 mM $MgCl_2$, 2.5 mM BSA, 2.5 mM Guanidine-HCl
Physical Specifications	
Multiple ScreenTape (96 well) compatibility	Not compatible
Analysis Time	16 samples: <25 min
Samples per consumable	1 ladder + 15 samples
Sample volume required	2 µL
Kit stability	4 months
Kit size	112 samples/box

1 signal-to-noise >3 (single peak)

2 Determined using the High Sensitivity D5000 Ladder as sample

3 Accuracy for run using single ScreenTape device

4 Measured against 2100 Bioanalyzer system

Specification (Genomic DNA ScreenTape Assay)

Analytical Specification	Genomic DNA ScreenTape assay and reagents
Sizing Range	200 bp to > 60000 bp
Sensitivity	0.5 ng/µL
Sizing Precision[1]	200 – 15000 bp: 15 % CV
Sizing Accuracy[1]	200 – 15000 bp: ±15 %
Quantitative Precision[2]	15 % CV
Quantitative Accuracy[3]	±20 %
Linear Concentration Range	10 – 100 ng/µL
DIN functional range	5 – 300 ng/µL
Physical Specification	
Analysis Time	16 samples: < 25 min 96 samples: < 150 min
Samples per consumable	1 ladder + 15 samples
Sample Volume Required	1 µL
Shelf Life	4 months
Box/Kit size	112 samples/box

1 Determined using the Genomic DNA Ladder as sample

2 Average result from various genomic DNA sample types

Specification (RNA ScreenTape Assay)

Analytical Specification	RNA ScreenTape assay and reagents
Quality Score	RIN^e
Quantitative Range	25 – 500 ng/µL
Quantitative Precision (%CV)[1]	5 %
Quantitative Accuracy	20 %
Sizing Range	100 – 6000 nt
Sensitivity[2]	5 ng/µL
RIN^e functional range	25 – 500 ng/µL
Analysis Type	Eukaryotic or Prokaryotic Total RNA QC
Maximum sample buffer strength	200 mM Tris, 20 mM EDTA, or 50 mM NaCl
Physical Specifications	
Analysis Time	16 samples < 16 min 96 samples < 100 min
Samples per consumable	16
Sample volume required (µL)	1
Kit Stability	4 months
Kit Size	112 samples

For total RNA samples

[1] Within a ScreenTape device

[2] Signal/noise >3 in water and TE

Specification (High Sensitivity RNA ScreenTape Assay)

Analytical Specification	HS RNA ScreenTape assay and reagents
Quality Score	RIN^e
Quantitative Range	500 – 10000 pg/µL
Quantitative Precision (%CV)[1]	10 %
Quantitative Accuracy	30 %
Sizing Range	100 – 6000 nt
Sensitivity[2]	100 pg/µL
RIN^e functional range	1000 – 25000 pg/µL
Analysis Type	Eukaryotic or Prokaryotic Total RNA QC
Maximum sample buffer strength	10 mM Tris 1 mM EDTA
Physical Specifications	
Analysis Time	16 samples < 30 min 96 samples < 180 min
Samples per consumable	16
Sample volume required (µL)	2
Kit Stability	4 months
Kit Size	112 samples

For total RNA samples

[1] Within a ScreenTape device

[2] Signal/noise >3 in water and TE

Specification (P200 ScreenTape Assay)

Analytical Specification	P200 ScreenTape assay and reagents
Sizing range	10 – 200 kDa
Resolution[1]	15 %
Typical Sizing Accuracy	±10 % (CAII, Lysozyme, beta lactoglobulin)
Sizing Precision	3 % CV
Quantitative Range/precision	100 – 1000 ng/µL for IgG; 15 % CV
Qualitative Range	5 – 5000 ng/µL BSA, Lysozyme; 12.5 – 5000 ng/µL IgG
Sensitivity[2]	5 ng/µL Lysozyme; 12.5 ng/µL IgG
Physical Specification	
Sample volume needed	2 µL
Analysis Time	16 samples: <15 min
Samples/consumable	16
Kit Size	112 Samples
Kit Stability	4 months

1 determined using P200 Ladder as sample

2 signal :noise ratio > 3

3
Installing the System

This chapter gives information about how to install the system.

Unpacking the System

Unpacking the Agilent 2200 TapeStation Instrument

Prerequisites

The installation and familiarization service is bundled with instrument sale, and will be conducted by an Agilent engineer.

Instrument and software familiarization should be completed before use.

Do not attempt to use the 2200 TapeStation instrument until you have read the accompanying Site and Safety Manual.

CAUTION

Condensation within the instrument

Condensation will damage the system electronics.

➔ If your instrument was shipped in cold weather, leave it in its box and allow it to warm slowly to room temperature to avoid condensation.

CAUTION

"Defective on arrival" problems

If there are signs of damage, please do not attempt to install the instrument. Inspection by Agilent is required to evaluate if the instrument is in good working condition.

➔ Notify your local Agilent Representative and the Technical support channel.

➔ An Agilent service representative will inspect the instrument at your site and initiate appropriate actions.

WARNING

Personal injury

The TapeStation instrument is heavy.

➔ Enlist the aid of a co-worker to share the lifting load to avoid personal injury.

1 Remove the 2200 TapeStation instrument from the packaging and place on a clean, dry, flat surface.

2 Allow the 2200 TapeStation instrument to acclimatize to the ambient temperature of the operating environment.

3 Remove the label covering the ScreenTape device holder, as shown in the image below.

Figure 4 Remove before use

Delivery Checklist

Ensure all parts and materials have been delivered with your system. The delivery checklist is shown below.

Please report any missing or damaged parts to your local Agilent Technologies sales and service office.

NOTE Please note that ScreenTape devices and reagent kits are not provided with instrument delivery and must be purchased separately.

Contents of the 2200 TapeStation System

The Agilent 2200 TapeStation System

Table 1 The Agilent 2200 TapeStation System (G2964AA, G2965AA)

Product	Volume	Properties
Agilent 2200 TapeStation instrument	1x	Instrument for loading, electrophoresis, imaging, and analyzing: • 2200 TapeStation system (G2964AA) or • 2200 TapeStation Nucleic Acid system (G2965AA)
2200 TapeStation Software Setup Disc	1x CD	The software is required to drive the 2200 TapeStation instrument and visualize the ScreenTape device analysis
Laptop	1x Laptop	Instrument Control Laptop
USB Cables/Power supply units	1x USB cable 2x power cords	1x USB cable to connect the laptop to the 2200 TapeStation instrument 1x Power supply unit for the laptop 1x Power supply unit for the 2200 TapeStation instrument
Sample Block	1 x 0.2 mL strip and 1 x 96-well plate	A removable sample block for the correct loading of samples within the 2200 TapeStation instrument
Tip Holder	2x	A removable cartridge for pipette tips placed in the 2200 TapeStation instrument
Loading tips	1x 384tips	Pipette tips to use in the 2200 TapeStation instrument
2200 TapeStation instrument - compatible 0.2 mL tube strips and lids	1x box of 120 tubes and caps	Tube strips for placing samples mixed with loading buffer into the 2200 TapeStation instrument
96-well plates	pack of 10	
96-well plate foil seal	pack of 100	
Loading tip transfer tool (optional)	1x	
IKA Vortexer and associated PCR plate (optional)	1x	Vortexer for mixing samples and reagents
Guides		Site Safety guide and Quick Guides (G2964AA - Protein, DNA and RNA; G2965AA - DNA and RNA)

ScreenTape Products

Kit Components (High Sensitivity D1000 ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5584	High Sensitivity D1000 ScreenTape		7 ScreenTape devices
5067-5585	High Sensitivity D1000 Reagents		2 vials
	• High Sensitivity D1000 Ladder		20 µL
	• High Sensitivity D1000 Sample Buffer		300 µL
5067-5587	High Sensitivity D1000 Ladder		1 vial
			20 µL

Kit Components (D1000 ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5582	D1000 ScreenTape		7 ScreenTape devices
5067-5583	D1000 Reagents		2 vials
	• D1000 Ladder		10 µL
	• D1000 Sample Buffer		400 µL
5067-5586	D1000 Ladder		1 vial, 10 µL

Kit Components (HS D5000 ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5592	High Sensitivity D5000 ScreenTape		7 ScreenTape devices
5067-5593	High Sensitivity D5000 Reagents		2 vials
	• High Sensitivity D5000 Ladder		20 µL
	• High Sensitivity D5000 Sample Buffer		300 µL
5067-5594	High Sensitivity D5000 Ladder		1 vial
			20 µL

Kit Components (D5000 ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5588	D5000 ScreenTape		7 ScreenTape devices
5067-5589	D5000 Reagents		2 vials
	• D5000 Ladder		10 µL
	• D5000 Sample Buffer		1300 µL
5067-5590	D5000 Ladder		1 vial
			10 µL

Kit Components (Genomic DNA ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5365	Genomic DNA ScreenTape		7 ScreenTape devices
5067-5366	Genomic DNA Reagents		2 vials
	• Genomic DNA Ladder		25 µL
	• Genomic DNA Sample Buffer		1350 µL

Kit Components (High Sensitivity RNA ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5579	High Sensitivity RNA ScreenTape		7 ScreenTape devices
5067-5580	High Sensitivity RNA ScreenTape Sample Buffer		1 vial 250 µL
5067-5581	High Sensitivity RNA ScreenTape Ladder		1 vial 10 µL

Kit Components (RNA ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5576	RNA ScreenTape		7 ScreenTape devices
5067-5577	RNA ScreenTape Sample Buffer		1 vial 600 µL
5067-5578	RNA ScreenTape Ladder		1 vial 10 µL

Kit Components (P200 ScreenTape Assay)

Part Number	Name	Color	Amount
5067-5371	P200 ScreenTape		7 ScreenTape devices
5067-5372	P200 Reagents		
	• P200 5X Labeling Dye		70 µL
	• P200 Labeling Buffer		350 µL
	• P200 Reducing Sample Buffer		550 µL
	• P200 pH Buffer	clear	1000 µL
	• P200 Non-Reducing Sample Buffer		550 µL
	• P200 Markers (pre-stained)		270 µL
	• P200 Ladder		40 µL

Installing the System

Software Installation

The software for your Agilent 2200 TapeStation system is preinstalled on the system laptop.

NOTE

For updates, or if you have to change the laptop, you may download the latest version of the software from the update server http://www.agilent.com/genomics/tapestation.

For details on installation of the software refer to the readme.txt file on the installation CD shipped with the 2200 TapeStation system.

Agilent 2200 TapeStation System Set Up

Hardware required	Laptop
Software required	Agilent Software packages (2200 TapeStation Controller Software, and TapeStation Analysis Software) (already installed)

WARNING

Personal injury, explosion or fire

- ➔ Do not operate the instrument in an atmosphere containing explosive gases or near flammable volatile liquids.
- ➔ Only approved mains cord set supplied with the instrument must be used with this instrument and if an extension lead is required, the lead must be earthed.
- ➔ If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

NOTE

For general safety information, please refer to the *2200 TapeStation System - Site and Safety Manual*.

WARNING

Use of unsupplied cables or power adaptors

Using cables or power adaptors not supplied by Agilent Technologies can lead to damage of the electronic components or personal injury.

- ➔ Never use cables or power adaptors other than the ones supplied by Agilent Technologies to ensure proper functionality and compliance with safety or EMC regulations.

1. Connect the supplied USB cable between the port on the back of the 2200 TapeStation instrument and your laptop.
2. Power the instrument with the supplied power lead and adaptor.
3. Turn the instrument on using the power switch located at the back of the 2200 TapeStation instrument.

   When powered and idle, the instrument will have a blue LED visible on the front of the case.

4 Windows may display a **Found New Hardware** wizard once the software has loaded. In this instance, always perform the following steps:

   a Select **No, not this time** to prevent connecting to Windows Update and searching for software.

   b In the next window select **Install the Software automatically**.

   c If a window appears, indicating the software did not pass the windows logo testing, click **Continue Anyway**.

A window appears, indicating that the hardware has been successfully installed. The 2200 TapeStation system will function.

NOTE

As there is more than one driver that can be detected and installed, you may need to follow these steps more than once.

You may need to follow these steps if you change the USB port on the laptop for the 2200 TapeStation instrument connector cable.

4
Using the 2200 TapeStation System

This chapter explains the intended use of the 2200 TapeStation system.

Intended Use of the 2200 TapeStation System

The 2200 TapeStation system carries out electrophoretic separation of Nucleic Acids and proteins. The system detects:

- Fluorescently stained double stranded DNA including genomic DNA
- Fluorescently stained total RNA (Eukaryotic and Prokaryotic)
- Fluorescently labelled proteins

Performance Limitations of Use

The 2200 TapeStation system can analyze a maximum of 16 samples at any one time, more samples can be run using a 96-well plate and multiple ScreenTape devices.

NOTE D5000 and High Sensitivity D5000 assays are limited to runs using a single ScreenTape device, and cannot be run from 96-well plates.

The user is responsible for establishing performance characteristics necessary for upstream and downstream applications. Appropriate controls must be included in any upstream application requiring analysis on the 2200 TapeStation system.

Additional Components Required by the User

Additional Consumables Required for the 2200 TapeStation Instrument

- Loading tips (5067-5152 or 5067-5153)
- Optical Tube 8x Strip (401428) and Optical Cap 8x Strip (401425) or 96-well Sample Plates (5067-5150) and 96-well Plate Foil Seal (5067-5154).
- Vortex mixer (See note below)

Additional Material Required (Not Supplied)

- Volumetric pipette
- Centrifuge
- Heating block or PCR machine

NOTE

Mixing recommendations

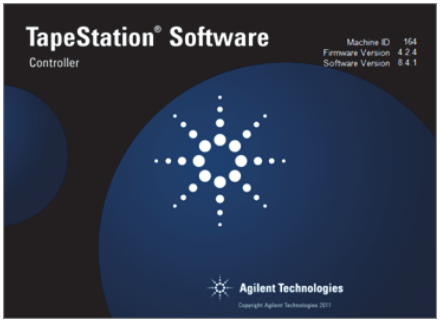
- 2200 TapeStation instruments are supplied with an optional IKA MS3 vortexer which includes a 96-well plate adaptor suitable for both 96-well PCR plates and 8-way strips.
- This vortexer is recommended for use with all ScreenTape assays with the exception of the P200 ScreenTape assay which should be manually vortexed.
- It is recommended that all current 2200 TapeStation system users purchase this instrument direct from IKA for use with these assays. Please quote part number 4674100 when ordering.
  - Agilent Technologies will not sell these parts separately.
- If an IKA MS3 vortexer is not available, please ensure thorough manual vortex mixing — 10 seconds on maximum speed.

Operating Procedure

1 Double click the 2200 TapeStation Controller Software icon on the desktop and follow the instructions on the screen.

NOTE Always ensure you are using the most up-to-date 2200 TapeStation Controller Software. Please check for the latest version.

You will now see the startup splash.



2 Insert the tube strip sample block into the 2200 TapeStation instrument.

OR

Insert the plate sample block into the 2200 TapeStation instrument.

3 Place loading tips into the loading tip holder as shown and insert into the 2200 TapeStation instrument.

NOTE If any used tips are left in the tip-buckets, a pop-up window will ask for the discarded tips to be removed. The 2200 TapeStation instrument will not run until all the tip buckets are empty.

NOTE A Loading tip transfer tool (G2964-60000) is available.

NOTE Ensure that all 16 loading tips are inserted into the tip holder.

The laptop utilized for performing any previous use(s) of the ScreenTape device must be utilized for all further re-use.

CAUTION Damage to the 2200 TapeStation instrument and impact on performance

Failure to use the correct consumable components can cause damage to the instrument.

➔ Use the recommended loading tips.

➔ Use the recommended foil plate seal.

4 Remove ScreenTape device from the foil packet.

5 Hold the ScreenTape device with the label facing you and gently flick the top of the ScreenTape device.

If there are any small bubbles present, this will move them to the top of the chamber.

NOTE The presence of small bubbles within the buffer chamber of the ScreenTape device is normal. These bubbles often occur at the gel/buffer interface and need to be displaced prior to running.

Failure to remove bubbles from the gel/buffer interface is detrimental to the performance of the ScreenTape device.

6 Insert the ScreenTape device into the 2200 TapeStation instrument, with the label towards the front of the instrument and the barcode facing right.

NOTE Protect the individual gel lanes within the ScreenTape device from excessive force. Do not bend or flex ScreenTape device and store in the provided packaging at the recommended temperature when not in use.

NOTE The 2200 TapeStation instrument will not recognize the ScreenTape device if inserted incorrectly.

NOTE The 2200 TapeStation system will automatically recognize the sample plate type and ScreenTape device and load the required parameters.

7 Prepare samples according to type as detailed in "How to prepare your samples" on page 50 or the appropriate Quick Guide.

8 Place samples into the sample block inside the TapeStation instrument.

NOTE D5000 and High Sensitivity D5000 Assays are limited to runs using a single ScreenTape device, and cannot be run from 96-well plates.

CAUTION

Damage to the 2200 TapeStation instrument and impact on performance

➔ Ensure the lids have been removed from the sample tubes.

9 Select the tubes or wells you wish to run by clicking and dragging the mouse over the sample locations in the user interface.

- Selected wells will change color from white.
- Selected lanes on the ScreenTape device image will change color.
- Lanes which have been run previously will appear gray.

NOTE

For best sizing precision and accuracy, the user should run the appropriate ladder with the samples.

If 16 samples are to be analyzed in parallel, the user may insert an electronic ladder for each application in the TapeStation Analysis Software.

Sizing results may not be as accurate using an electronic ladder.

Electronic ladder functionality is not available for D5000, High Sensitivity D5000, or Genomic DNA assays.

NOTE

Each ScreenTape device can be used up to 2 weeks after its first use if it has been stored upright between 2 – 8 °C (36 – 46 °F).

Simply select the samples in the same manner as for an unused ScreenTape device. The first sample selected will automatically appear in the first available lane.

NOTE

Partially used ScreenTape devices (those that contain lanes run on previous occasions) should be returned to the box and stored vertically between 2 – 8 °C (36 – 46 °F) for a maximum of 2 weeks.

DNA Reagents

Store from 2 – 8 °C (36 – 46 °F).

RNA Sample Buffer

Store from 2 – 8 °C (36 – 46 °F).

RNA Ladder

Store below –20 °C (-4 °F).

P200 Reagents

Store from -30 to -20 °C (-30 to -4 °F).

10 The sample selection can be deleted by right clicking on the sample plate image.

A menu will appear with the following options:

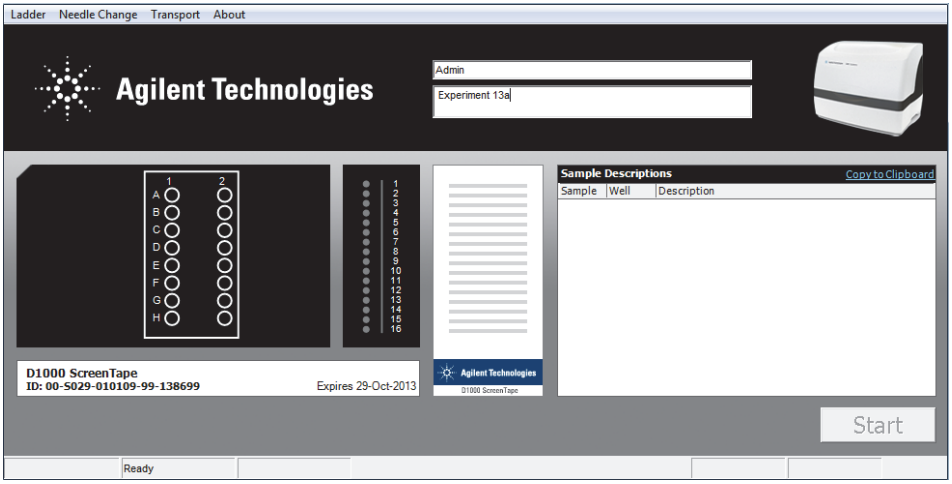
- **Clear All Selections** - this will clear ladder well and all sample wells selected
- **Clear Last Selection** - this will only clear the last samples to be highlighted

NOTE

Pressing **Escape** on the keyboard will also cancel the current selections.

Add Experiment Notes

1 If required, notes can be manually entered into the software before the instrument is started.



Describe Samples

1 Sample descriptions can be manually entered into the software before the instrument is started and whilst the 2200 TapeStation instrument is operating, before TapeStation Analysis Software is launched.

OR

Sample data can be copied and pasted from an Excel table.

NOTE The entered Sample descriptions data can be copied to clipboard by using the Copy to Clipboard link in the top right hand corner of the **Sample Description** table.

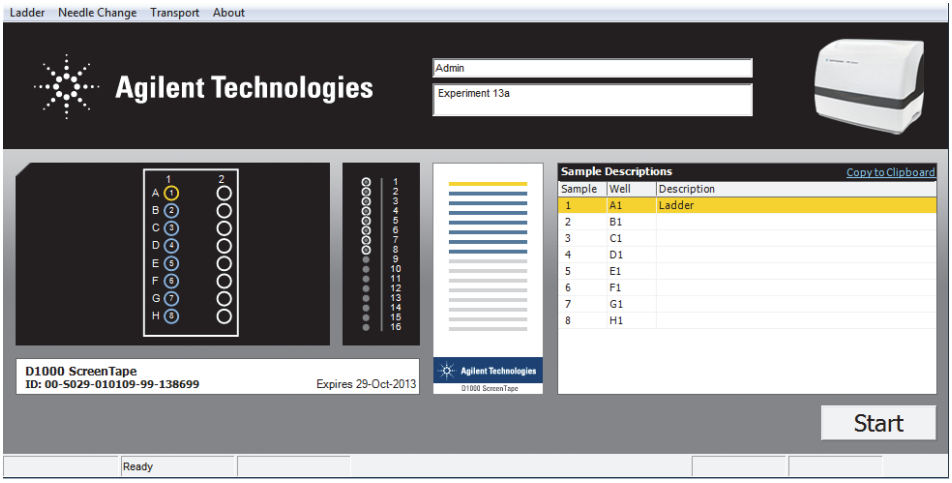


Figure 5 2200 TapeStation Controller Software image (8 way strip selection)

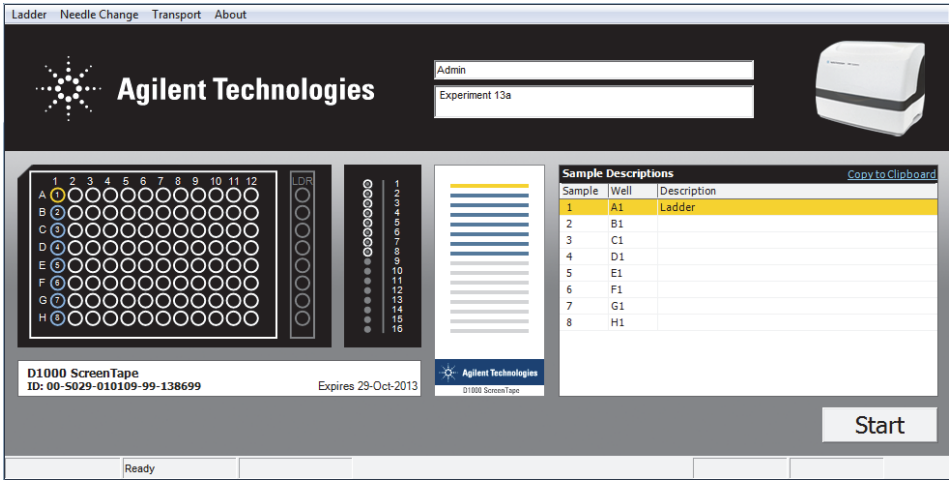


Figure 6 2200 TapeStation Controller Software image (96-well plate selection)

NOTE In the 96-well plate sample selection screen the panel labeled LDR is not available for selection.

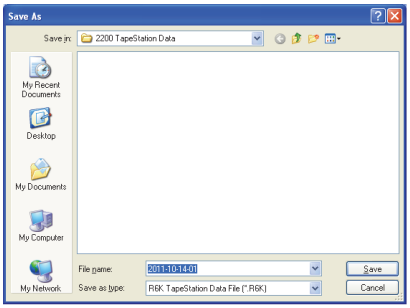
NOTE All information entered in the 2200 TapeStation Controller Software will appear in the analysed results.

Start the Run

1 Click the start button.

This will produce a **Save As** window.

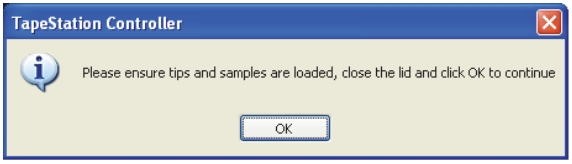
As a default the file name starts with the date, in reverse order, and a run counter. When run continuously, the save function auto increments the counter part of the file name.



2 Type in the name that you wish the analysis to be saved as. Do not include a full stop (.) in file names.

Final Check

2200 TapeStation Controller Software:



1 Lift the lid of the 2200 TapeStation instrument.

2 Ensure that there are fresh tips in the tip holder and that all the samples have been correctly loaded with lids removed and correspond to the sample selection on the screen.

3 Close the lid.

NOTE Lifting the lid of the 2200 TapeStation instrument after this time will abort the experimental run.

Running System

WARNING **Exposure to potentially dangerous mechanical parts**

➔ Do not open the lid whilst the front LED is flashing.

Abort the Run

1 If, for any reason, you wish to abort an experiment, click the abort button on the pop-up controller. The 2200 TapeStation Controller Software will ask:

   a If you want to reset the instrument to begin another experiment – this will return the 2200 TapeStation Controller Software and 2200 TapeStation instrument to the beginning of the next experiment.

   b If you want to close down the controller – this will close the 2200 TapeStation Controller Software and keep the 2200 TapeStation instrument temporarily locked in its current state.

NOTE Aborting the experiment will irretrievably discard any progress made and samples loaded.

Complete the Run

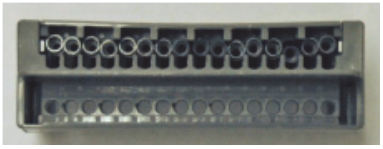
When finished, a pop up will ask for removal of the tip cartridge and ScreenTape device.

1 Remove tip cartridge and ScreenTape device.

2 Click **OK**.

Empty Tip Buckets

1 Empty tip buckets.



NOTE

Used loading tips must be removed from the tip buckets before the next experimental run. The TapeStation instrument will not start if tips are detected in the buckets.

Used ScreenTape devices, sample strips, and tips should be disposed of in accordance to local regulations.

How to Use the TapeStation Analysis Software

NOTE

For further information please refer to the software help.

This can be accessed by selecting the question mark (?) button in the top right hand corner of the TapeStation Analysis Software.

Shutdown and Restarting Procedure

Shutdown Procedure

NOTE The 2200 TapeStation Controller Software, 2200 TapeStation instrument and laptop should be shut down when not in use (preferably at the end of every working day).

Ensure that the 2200 TapeStation system is shut down in the following order:

1. Exit the 2200 TapeStation Controller Software.
2. Turn off the 2200 TapeStation instrument.
3. Power down the laptop.

Restarting Procedure

Ensure that the 2200 TapeStation system is restarted in the following order:

1. Power up the laptop.
2. Turn on the 2200 TapeStation instrument.
3. Start the 2200 TapeStation Controller Software.

How to prepare your samples

WARNING

Toxic agents

The handling of solvents, samples and reagents can hold health and safety risks.

- ➔ When using/handling the ScreenTape device and working with these substances observe appropriate safety procedures (for example by wearing goggles, safety gloves and protective clothing).
- ➔ Always follow good laboratory practices and adhere to the guidelines established in your laboratory.
- ➔ Refer to product material safety datasheets for further information.
- ➔ The volume of substances should be reduced to the minimum required for the analysis.

CAUTION

Damage to the 2200 TapeStation instrument

- ➔ Use only the recommended consumables and reagents with the 2200 TapeStation system.

NOTE

- When pipetting sample buffer, ensure that excess buffer droplets are removed from the tip before transfer to the sample tubes. Care must be taken due to viscosity of Sample Buffers.
- When pipetting small volumes ensure that no sample remains within the tip.
- When adding sample buffer to sample, please ensure that they are mixed correctly by following assay instructions.
- Improper mixing can lead to quantification errors.
- Once mixed briefly centrifuge to collect the contents at the base of tubes.
- For best results, ensure that all reagents are allowed to equilibrate to room temperature for 30 minutes prior to use.

NOTE

For successful loading, the sample solution must be placed at the bottom of the tube or well without any air-bubbles; centrifugation of samples after preparation is essential. The 2200 TapeStation instrument will load a sample from a minimum of 3 µL onto the ScreenTape device.

Ladder Options

NOTE

For best sizing precision and accuracy, the user should run the appropriate ladder with the samples.

Alternatively the user can choose to run an electronic ladder. This is done by choosing **No ladder** in the 2200 TapeStation Controller Software electronic ladder menu, then running the instrument as normal. An electronic ladder can then be inserted in the TapeStation Analysis Software.

Sizing results may not be as accurate using an electronic ladder.

Ladders not run in the first available position, or in **No ladder** mode can later be assigned as ladder using the TapeStation Analysis Software.

NOTE

Electronic ladder functionality is not available for D5000, High Sensitivity D5000, or Genomic DNA assays.

Good Measurement Practices for Analysing DNA on the Agilent 2200 TapeStation

For accurate results using the 2200 TapeStation system, instructions regarding reagent preparation and instrument maintenance must be strictly followed. Important technical details are described in the 2200 TapeStation System Manual and Quick Guides.

The describes techniques for ensuring reliable quantification and sizing results using DNA assays on the 2200 TapeStation system, and includes advice on the following topics:

- Quantification
- Sizing
- Molarity
- Genomic DNA Assay

This Technical Note and all other 2200 User Information can be found on the Agilent website: http://www.agilent.com/genomics/tapestation.

DNA Sample Preparation

NOTE

- When pipetting sample buffer, ensure that excess buffer droplets are removed from the tip before transfer to the sample tubes. Care must be taken due to viscosity of Sample Buffers.
- When pipetting small volumes ensure that no sample remains within the tip.
- When adding sample buffer to sample, please ensure that they are mixed correctly by following assay instructions.
- Improper mixing can lead to quantification errors.
- Once mixed briefly centrifuge to collect the contents at the base of tubes.
- For best results, ensure that all reagents are allowed to equilibrate to room temperature for 30 minutes prior to use.

NOTE

When using 96-well plates, the use of a 96-well plate vortex adaptor is advised to ensure correct sample mixing. Improper mixing can lead to quantification errors.

As with samples in 8-way strips, briefly centrifuge after vortexing to collect the contents at the base of the tubes before placing into the 2200 TapeStation instrument.

D5000 and High Sensitivity D5000 assays are limited to runs using a single ScreenTape device, and cannot be run from 96-well plates.

NOTE

Mixing recommendations

- 2200 TapeStation instruments are supplied with an optional IKA MS3 vortexer which includes a 96-well plate adaptor suitable for both 96-well PCR plates and 8-way strips.
- This vortexer is recommended for use with all ScreenTape assays with the exception of the P200 ScreenTape assay which should be manually vortexed.
- It is recommended that all current 2200 TapeStation system users purchase this instrument direct from IKA for use with these assays. Please quote part number 4674100 when ordering.
  - Agilent Technologies will not sell these parts separately.
- If an IKA MS3 vortexer is not available, please ensure thorough manual vortex mixing - 10 seconds on maximum speed.

NOTE

For successful loading, the sample solution must be placed at the bottom of the tube or well without any air-bubbles; centrifugation of samples after preparation is essential. The 2200 TapeStation instrument will load a sample from a minimum of 3 µL onto the ScreenTape device.

NOTE

For best sizing precision and accuracy, the user should run the appropriate ladder with the samples.

If 16 samples need to be analyzed in parallel, you may choose to insert an electronic ladder in the TapeStation Analysis Software.

Sizing results may not be as accurate using an electronic ladder.

Electronic ladder functionality is not available for D5000, High Sensitivity D5000, or Genomic DNA assays.

Sample Preparation D1000 ScreenTape Assay

Prepare TapeStation System D1000

Parts required

p/n	Description
5067-5582	D1000 ScreenTape

1 Launch the 2200 TapeStation Controller Software.

2 Load D1000 ScreenTape device and loading tips into the 2200 TapeStation instrument.

Sample Preparation D1000 ScreenTape Assay

Parts required

p/n	Description
5067-5583	D1000 Reagents

1 Allow reagents to equilibrate at room temperature for 30 min

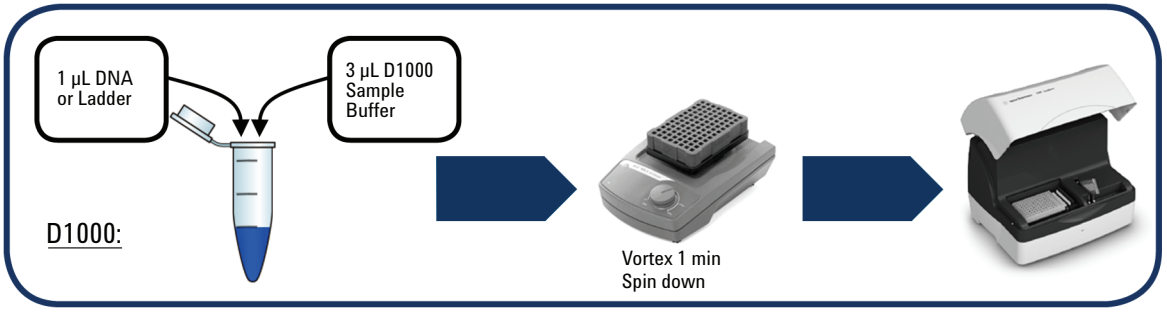
2 Vortex mix before use

3 If running ladder, prepare by mixing 3 µL D1000 Sample Buffer (●) with 1 µL D1000 Ladder (●)

4 Prepare sample by mixing 3 µL D1000 Sample Buffer (●) with 1 µL DNA sample

5 Spin down, then vortex using IKA vortexer and adaptor at 2000 rpm for 1 min.

6 Spin down to position the sample at the bottom of the tube.



Sample Preparation High Sensitivity D1000 ScreenTape Assay

Prepare TapeStation System HSD1000

Parts required	p/n	Description
	5067-5584	High Sensitivity D1000 ScreenTape

1 Launch the 2200 TapeStation Controller Software.

2 Load High Sensitivity D1000 ScreenTape device and loading tips into the 2200 TapeStation instrument.

Sample Preparation High Sensitivity D1000 ScreenTape Assay

Parts required	p/n	Description
	5067-5585	High Sensitivity D1000 Reagents

1 Allow reagents to equilibrate at room temperature for 30 min

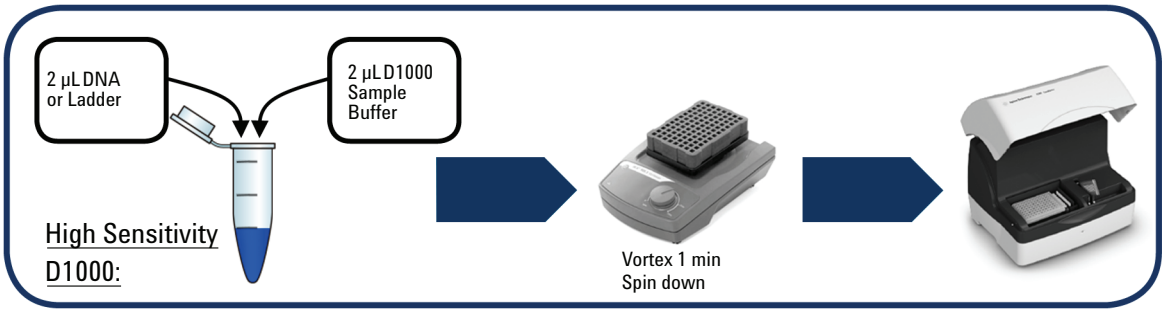
2 Vortex mix before use

3 If running ladder, prepare by mixing 2 µL High Sensitivity D1000 Sample Buffer (●) with 2 µL High Sensitivity D1000 Ladder (●)

4 Prepare sample by mixing 2 µL High Sensitivity D1000 Sample Buffer (●) with 2 µL DNA sample

5 Spin down, then vortex using IKA vortexer and adaptor at 2000 rpm for 1 min.

6 Spin down to position the sample at the bottom of the tube.



Sample Preparation D5000 ScreenTape Assay

Prepare TapeStation System D5000

Parts required

p/n	Description
5067-5588	D5000 ScreenTape

1 Launch the 2200 TapeStation Controller Software.

2 Load single D5000 ScreenTape device and loading tips into the 2200 TapeStation instrument

Sample Preparation D5000 ScreenTape Assay

Parts required

p/n	Description
5067-5589	D5000 Reagents

1 Allow reagents to equilibrate at room temperature for 30 min

2 Vortex mix before use

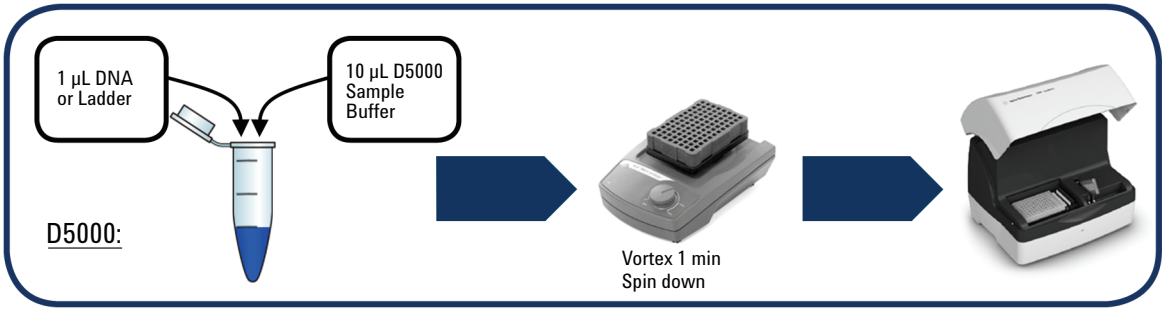
3 Prepare ladder by mixing 10 µL D5000 Sample Buffer (●) with 1 µL D5000 Ladder (●) in a tube strip.

NOTE Use a fresh ladder for each run. No electronic ladder is available for the D5000 assay.

4 Prepare sample by mixing 10 µL D5000 Sample Buffer (●) with 1 µL DNA sample in the same tube strip.

5 Spin down, then vortex using IKA vortexer and adaptor at 2000 rpm for 1 min.

6 Spin down to position the sample at the bottom of the tube.



Sample Preparation High Sensitivity D5000 ScreenTape Assay

Prepare TapeStation System HSD5000

Parts required	p/n	Description
	5067-5592	High Sensitivity D5000 ScreenTape

1 Launch the 2200 TapeStation Controller Software.
2 Load single High Sensitivity D5000 ScreenTape device and loading tips into the 2200 TapeStation instrument

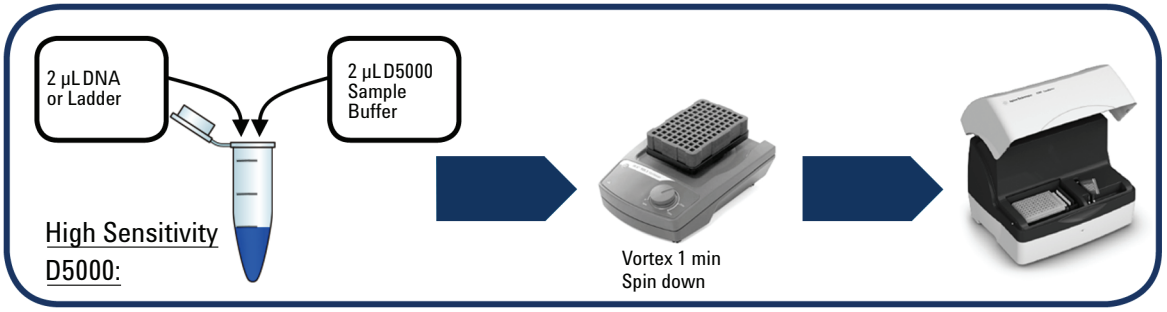
Sample Preparation High Sensitivity D5000 ScreenTape Assay

Parts required	p/n	Description
	5067-5593	High Sensitivity D5000 Reagents

1 Allow reagents to equilibrate at room temperature for 30 min
2 Vortex mix before use
3 Prepare ladder by mixing 2 µL High Sensitivity D5000 Sample Buffer (🟢) with 2 µL High Sensitivity D5000 Ladder (🟡) in a tube strip.

NOTE Use a fresh ladder for each run. No electronic ladder is available for the High Sensitivity D5000 assay.

4 Prepare sample by mixing 2 µL High Sensitivity D5000 Sample Buffer (🟢) with 2 µL DNA sample in the same tube strip.
5 Spin down, then vortex using IKA vortexer and adaptor at 2000 rpm for 1 min.
6 Spin down to position the sample at the bottom of the tube.



Sample Preparation Genomic DNA ScreenTape Assay

Prepare TapeStation System gDNA

Parts required	p/n	Description
	5067-5365	Genomic DNA ScreenTape

1 Launch the 2200 TapeStation Controller Software.

2 Load Genomic DNA ScreenTape device and loading tips into the 2200 TapeStation instrument.

Sample Preparation Genomic DNA ScreenTape Assay

Parts required	p/n	Description
	5067-5366	Genomic DNA Reagents

1 Allow reagents to equilibrate at room temperature for 30 min

2 Vortex mix before use.

3 Prepare ladder by mixing 10 µL Genomic DNA Sample Buffer (●) with 1 µL Genomic DNA Ladder (●)

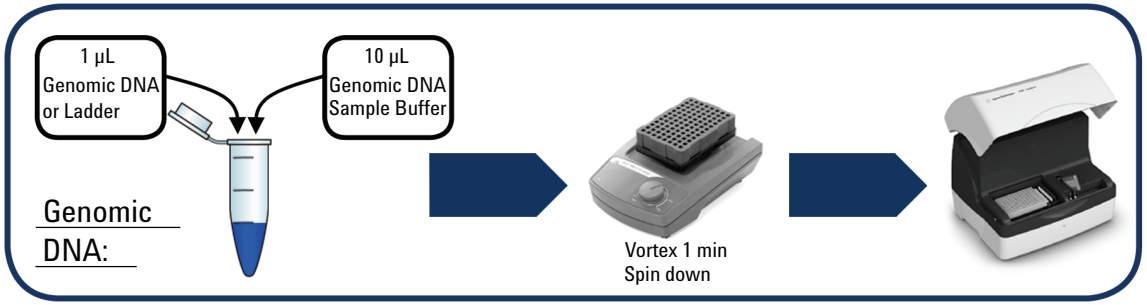
NOTE Use a fresh ladder for each run. No electronic ladder is available for the Genomic DNA assay.

4 Prepare sample by mixing 10 µL Genomic DNA Sample Buffer (●) with 1 µL genomic DNA sample (10 – 100 ng/µL).

5 Spin down, then vortex using IKA vortexer and adaptor at 2000 rpm for 1 min.

6 Spin down to position the sample at the bottom of the tube.

7 Load sample plate, tips, ScreenTape device, and Samples into the TapeStation instrument as detailed in operating procedure section.



RNA Sample Preparation

CAUTION

Sample degradation

➔ Ensure all working areas, reagents and plastic ware are RNase free.

➔ Handle RNA samples with care.

➔ Wear gloves at all times.

➔ Thaw RNA samples on ice.

➔ Vortex and centrifuge all samples before use.

➔ Store RNA samples on ice throughout the ScreenTape analysis procedure.

NOTE

- It is important to place the samples on ice directly after the denaturation step as this aids complete and stable denaturation of the RNA.
- To ensure optimal performance of the RNA ScreenTape assays, samples should be analyzed using the 2200 TapeStation instrument within 3 h of the denaturation step. Beyond 3 h denatured samples should be stored on ice or in a suitable freezable sample block.

NOTE

- For best results, ensure that all reagents are allowed to equilibrate to room temperature prior to use.
- When pipetting Sample Buffer, ensure that excess buffer droplets are removed from the tip before transfer to the sample tubes.

  Care must be taken due to the viscosity of Sample Buffers.
- When pipetting small volumes ensure that no sample remains within the tip.
- When adding Sample Buffer to sample, please ensure that they are mixed correctly. To achieve this, gently mix several times with additional pipetting, then cap the tubes, vortex mix using IKA vortexer and adaptor at 2000 rpm for 1 min.
- Briefly centrifuge to collect the contents at the base of the tubes.
- *Improper mixing can lead to quantification errors.*

NOTE

Mixing recommendations

- 2200 TapeStation instruments are supplied with an optional IKA MS3 vortexer which includes a 96-well plate adaptor suitable for both 96-well PCR plates and 8-way strips.
- This vortexer is recommended for use with all ScreenTape assays with the exception of the P200 ScreenTape assay which should be manually vortexed.
- It is recommended that all current 2200 TapeStation system users purchase this instrument direct from IKA for use with these assays. Please quote part number 4674100 when ordering.
  - Agilent Technologies will not sell these parts separately.
- If an IKA MS3 vortexer is not available, please ensure thorough manual vortex mixing — 10 seconds on maximum speed.

Sample Preparation RNA ScreenTape Assay

Prepare TapeStation System RNA

Parts required

p/n	Description
5067-5576	RNA ScreenTape

1 Launch the 2200 TapeStation Controller Software.

2 Load RNA ScreenTape device and loading tips into the 2200 TapeStation instrument.

3 Select RNA Protocol (**Eukaryotic RNA** or **Prokaryotic RNA**)

Sample Preparation RNA ScreenTape Assay

Parts required

p/n	Description
5067-5577	RNA ScreenTape Sample Buffer
5067-5578	RNA ScreenTape Ladder

1 Allow reagents to equilibrate at room temperature for 30 min

2 Vortex mix before use

3 Thaw total RNA samples on ice

4 If running ladder, prepare by mixing 5 µL RNA Sample Buffer () with 1 µL RNA Ladder ().

5 Prepare sample by mixing 5 µL RNA Sample Buffer () with 1 µL RNA sample.

NOTE For best results, use the reverse pipetting technique.

6 Spin down, then vortex using IKA vortexer and adaptor at 2000 rpm for 1 min.

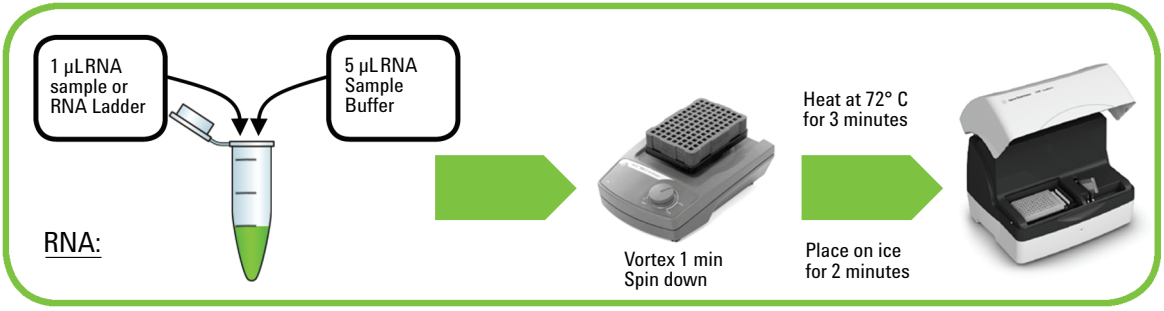
7 Spin down to position the sample at the bottom of the tube.

8 Ladder/Sample denaturation

a Heat ladder and samples at 72 °C (162 °F) for 3 min

b Place ladder and samples on ice for 2 min

c Spin down to position the sample at the bottom of the tube



Sample Preparation High Sensitivity RNA ScreenTape Assay

Prepare TapeStation System HSRNA

Parts required

p/n	Description
5067-5579	High Sensitivity RNA ScreenTape

1. Launch the 2200 TapeStation Controller Software.
2. Load High Sensitivity RNA ScreenTape device and loading tips into the 2200 TapeStation instrument.
3. Select RNA Protocol (**Eukaryotic RNA** or **Prokaryotic RNA**)

Sample Preparation High Sensitivity RNA ScreenTape Assay

Parts required

p/n	Description
5067-5580	High Sensitivity RNA ScreenTape Sample Buffer
5067-5581	High Sensitivity RNA ScreenTape Ladder

1. Allow reagents to equilibrate at room temperature for 30 min
2. Vortex mix before use
3. Thaw total RNA samples on ice
4. Prepare diluted Ladder solution, by adding 10 µL RNase free water to the High Sensitivity RNA Ladder vial and mixing thoroughly.
5. If running ladder, prepare by mixing 1 µL High Sensitivity RNA Sample Buffer () with 2 µL RNA ladder ()
6. Prepare sample by mixing 1 µL High Sensitivity RNA Sample Buffer () with 2 µL RNA sample

NOTE

For best results, use the reverse pipetting technique.

Freeze any unused Ladder at -20 °C (-4 °F).

7. Spin down, then vortex using IKA vortexer and adaptor at 2000 rpm for 1 min.

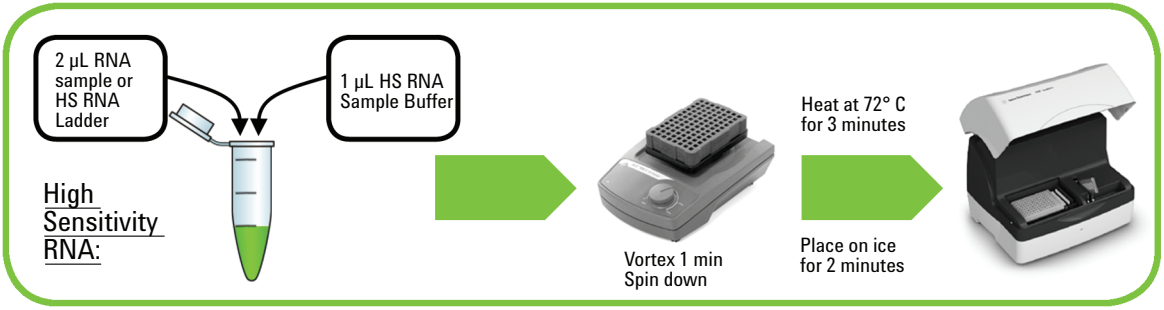
8 Spin down to position the sample at the bottom of the tube.

9 Ladder/Sample denaturation

a Heat ladder and samples at 72 °C (162 °F) for 3 min

b Place ladder and samples on ice for 2 min

c Spin down to position the sample at the bottom of the tube



Protein Sample Preparation

NOTE

- When pipetting sample buffer, ensure that excess buffer droplets are removed from the tip before transfer to the sample tubes. Care must be taken due to viscosity of Sample Buffers.
- When pipetting small volumes ensure that no sample remains within the tip.
- When adding sample buffer to sample, please ensure that they are mixed correctly by following assay instructions.
- Improper mixing can lead to quantification errors.
- Once mixed briefly centrifuge to collect the contents at the base of tubes.
- For best results, ensure that all reagents are allowed to equilibrate to room temperature for 30 minutes prior to use.

NOTE

Improper mixing can lead to quantification errors.

NOTE

For successful loading, the sample solution must be placed at the bottom of the tube or well without any air-bubbles; centrifugation of samples after preparation is essential. The 2200 TapeStation instrument will load a sample from a minimum of 3 µL onto the ScreenTape device.

NOTE

For best sizing precision and accuracy, the user should run the appropriate ladder with the samples.

If 16 samples need to be analyzed in parallel, you may choose to insert an electronic ladder in the TapeStation Analysis Software.

Sizing results may not be as accurate using an electronic ladder.

Sample Preparation P200 ScreenTape Assay

Prepare TapeStation System P200

Parts required	p/n	Description
	5067-5371	P200 ScreenTape

1 Launch the Agilent 2200 TapeStation Controller Software.

2 Load P200 ScreenTape device and loading tips into the 2200 TapeStation instrument.

Sample Preparation P200 ScreenTape Assay

Parts required	p/n	Description
	5067-5372	P200 Reagents

1 Prepare the P200 stain solution.

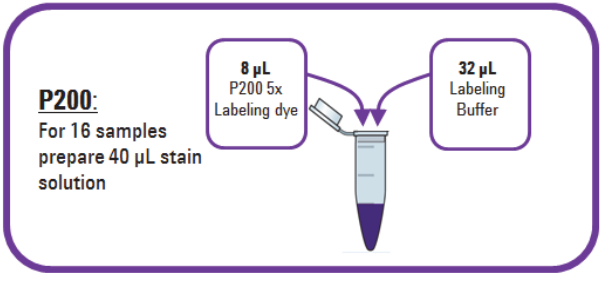
a Dilute P200 5X Labeling Dye (●) at a ratio of 1:5 with P200 Labeling Buffer (●)

NOTE

The prepared stain solution is best used on the day of formulation, however it can be stored for up to one week below -20 °C (-4 °F).

For normal applications, 2 µL of formulated stain solution is required for 2 µL of sample. For 16 samples 8 µL of 5X Stain would be diluted with 32 µL of Stain Buffer. The resultant stain solution should be thoroughly mixed before use.

For certain applications, particularly with high protein concentrations, higher concentrations of stain can be used in combination with altered ratios of stain to sample.



NOTE

The P200 ladder ( ) should be processed through the P200 sample preparation procedure using the P200 reducing buffer.

In **Ladder** mode, selected in the ladder options in the 2200 TapeStation Controller Software, P200 ladder is automatically selected as the first sample.

The user can also select to run no ladder, and then to insert an electronic ladder in the TapeStation Analysis Software.

Sizing results may not be as accurate using an electronic ladder.

2 Stain protein sample or ladder.

- **a** Place 2 µL of P200 stain solution (prepared above) into a PCR tube strip or 96-well plate.
- **b** Pipette 2 µL of the protein sample or ladder into the tube, mix and attach the lids or foil cover to prevent evaporation.
- **c** Heat for 7 min at 75 °C (167 °F).
- **d** After heating, remove condensation from the lids (or foil cover) of the tubes by centrifugation.

NOTE

P200 pH buffer (clear) is supplied to allow the user to dilute samples to alleviate issues with staining efficiency caused by low pH. The use of P200 pH Buffer resolves these issues in most circumstances. For further information on buffer compatibility, contact your Agilent Technologies representative.

3 Denature sample and ladder.

- **a** Choose which sample buffer is required: P200 Reducing Sample Buffer ( ) or P200 Non-reducing Sample Buffer ( ).
- **b** Add 4 µL of the relevant P200 sample buffer to the stained sample and replace the lids or foil cover.
- **c** Mix then heat at 75 °C (167 °F) for 5 min.
- **d** Remove condensation from the lids (or foil cover) of the tubes by centrifugation.

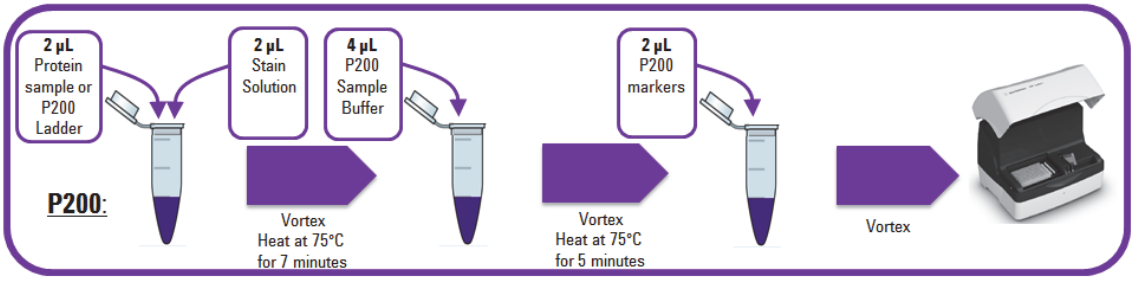
4 Add 2 µL of P200 Marker ( ) to each sample and to the P200 ladder.

5 Mix the solution well, and centrifuge to ensure that the sample is at the bottom of the tube, ready for analysis on the 2200 TapeStation system.

NOTE

P200 Marker is formulated with a high percentage of glycerol. Due to the high density of this reagent, the user must ensure that the samples are adequately mixed prior to analysis on the TapeStation system. Failure to do so may result in unsatisfactory analysis results.

6 Load sample plate, tips, ScreenTape device, and Samples into the 2200 TapeStation instrument as detailed in operating procedure section.



5 Maintenance

This chapter describes the maintenance of the TapeStation system.

General Information

For continuous reliable operation, the 2200 TapeStation system requires a defined set of Preventative Maintenance (PM) operations to be performed every 16000 samples or on an annual basis. This maintenance must be performed by a trained Agilent Field Service Engineer and can be scheduled by contacting your local Agilent Service representative.

During the PM the following components within the 2200 TapeStation system will be replaced:

- Fan filters
- Piercing Needles
- Electrophoresis Probes

The instruments tip sensor will also be re-adjusted, all moving axes will be lubricated, optics cleaned, and any foreign objects will be removed.

In addition to the Annual Preventative Maintenance service, users with a high throughput of samples are required to perform a Needle Change procedure every 8320 samples. This simple procedure is explained in "Changing the Needle" on page 73, and can be performed by the end user with the aid of a disposable cartridge.

Users who wish to check the function of their 2200 TapeStation instrument between PM services can perform a check using the TapeStation Test Tape, as described in "TapeStation Test Tape" on page 78.

Changing the Needle

It is important to know which 2200 TapeStation system you have before changing the needle(s), in order to purchase the correct needle cartridge.

Table 2 Overview of TapeStation system configuration - needle cartridge

Product number	TapeStation system configuration	Pump	Needle cartridge ordering code
ST007	TapeStation system for ScreenPlex	Single	G2960-60062
ST008	TapeStation system for DNA		
ST009	TapeStation system for Nucleic acids		
ST017	TapeStation system for ScreenPlex	Twin	G2960-60063
ST019	TapeStation system for Nucleic acids		
ST010	TapeStation system for Protein / Combined TapeStation system		
G2960A	2200 TapeStation system	Twin	G2960-60063
G2961A	2200 TapeStation Nucleic Acid system		
G2964AA	2200 TapeStation system		
G2965AA	2200 TapeStation Nucleic Acid system		
G2966AA	2200 TapeStation ScreenPlex system		

Needle change intervals:

- After 7680 lanes (3840 pierces in a Single loading system), the 2200 TapeStation Controller Software will inform the user that a needle change is pending. The word **Needle** will appear in the bottom of the software inside a yellow box.
- After 8320 lanes (4160 pierces in a Single loading system), a needle change is recommended. The box around the word **Needle** will change from yellow to red.
- After 8960 lanes (4480 pierces in a Single loading system), the needle has completed its lifetime and must be changed before the 2200 TapeStation instrument will start.

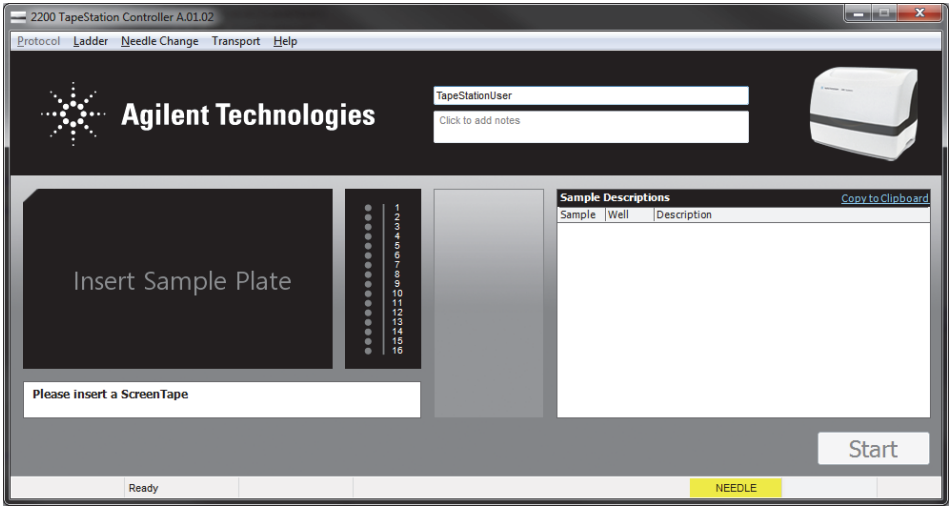


Figure 7 Agilent 2200 TapeStation Controller Software indicating a **Needle** change is recommended

Parts required	#	p/n	Description
	1	G2960-60062	Needle cartridge (for use in single pump systems) For use with product numbers ST007, ST008 and ST009
OR	1	G2960-60063	Needle cartridge (for use in dual pump systems) For use with product numbers ST017, ST019, ST010, G2960A, G2961A, G2964AA, G2965AA and G2966AA

NOTE The needle replacement procedure as detailed below is performed during the annual Preventative Maintenance procedure.

Customers with high throughput may require additional needle changes between PM services, and should use the table above to order the correct parts for their instrument.

NOTE New needle cartridges can be ordered at any time from Agilent Technologies by contacting your local sales agent.

For details on the correct needle cartridge for your 2200 TapeStation instrument, refer to Table 2 on page 73.

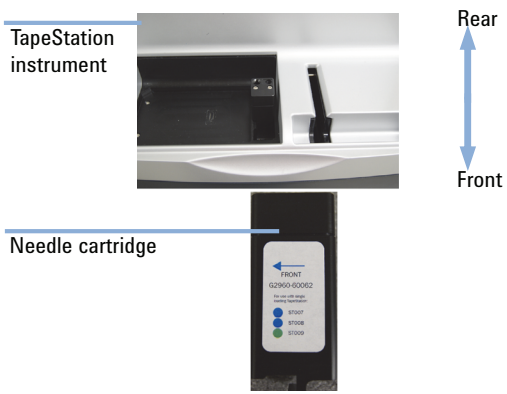
Changing the needle cartridge

1 Remove the sample plate and tip holder.

2 Remove the foil tab from the top of the needle cartridge.

NOTE Care must be taken to keep the needle cartridge level after removing the foil tab

3 Insert the needle cartridge into the tip holder space, using the label for orientation. The cartridge should be placed so that the label faces to the right, and the printed arrow points to the front of the 2200 TapeStation instrument.



4 Close the lid.

5 Go to **Needle Change** on the 2200 TapeStation Controller Software toolbar and select **Run**.

Preventative Maintenance Interval

After 16000 samples, the 2200 TapeStation Controller Software will inform the user that Preventative Maintenance is required. The word **Maintenance** will appear in the bottom of the software inside a yellow box. The Preventative Maintenance service must be performed by a trained Agilent Field Service Engineer and can be scheduled by contacting your local Agilent Service representative.

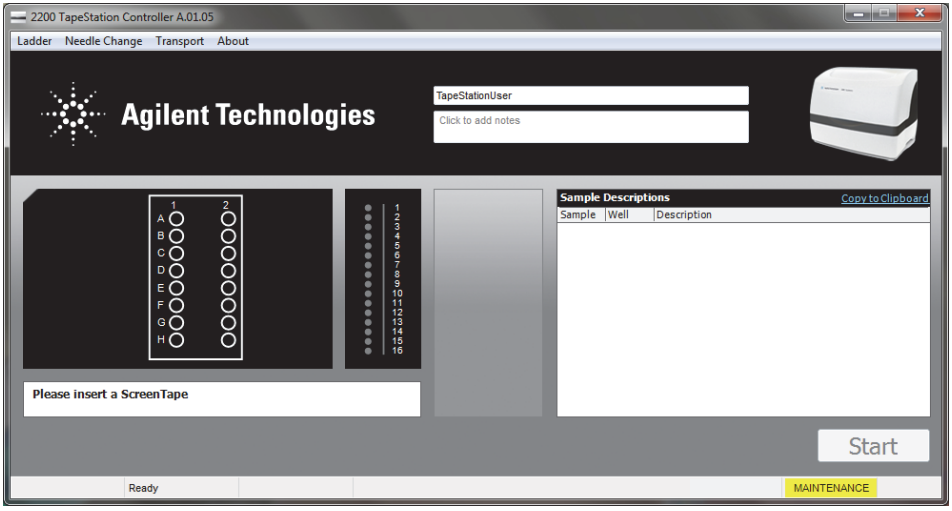


Figure 8 2200 TapeStation Controller Software indicating a Preventative Maintenance is due

If both the **Maintenance** message and the **Needle** message are being displayed simultaneously then only a Preventative Maintenance should be performed. The Preventative Maintenance procedure includes a Needle Change and following PM service both messages will disappear.

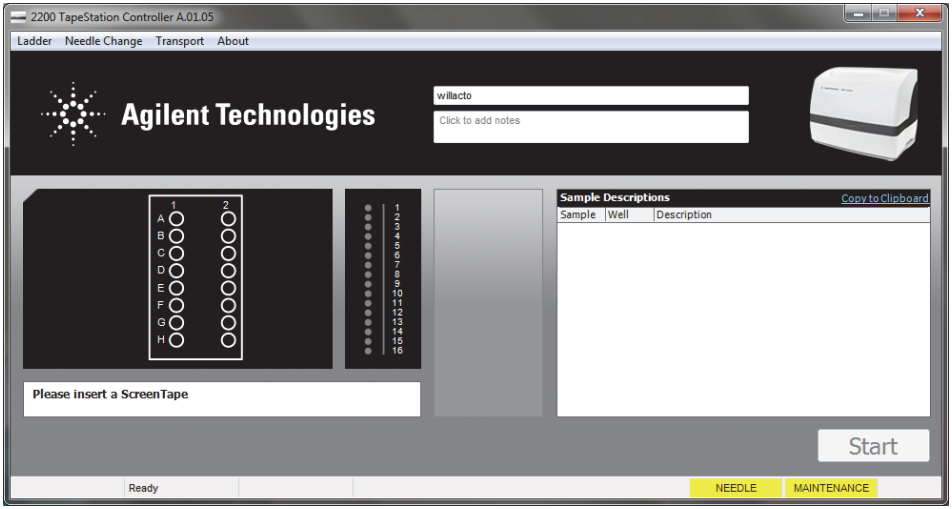


Figure 9 2200 TapeStation Controller Software indicating both a needle change and a Preventative Maintenance is due. Schedule Preventative Maintenance, do not perform a Needle Change

TapeStation Test Tape

The Agilent TapeStation Test Tape (5067-5601) is a device designed to be used with the 2200 TapeStation system for hardware diagnosis.

The TapeStation Test Tape can be inserted into the 2200 TapeStation instrument to check the performance of electrical and optical components. It can be used for routine conformation of the system functionality or for instrument troubleshooting as directed by your support representative.

NOTE The TapeStation Test Tape is designed for instrument diagnostic purposes only, and as such will not apply any changes to the 2200 TapeStation system.

Using the TapeStation Test Tape

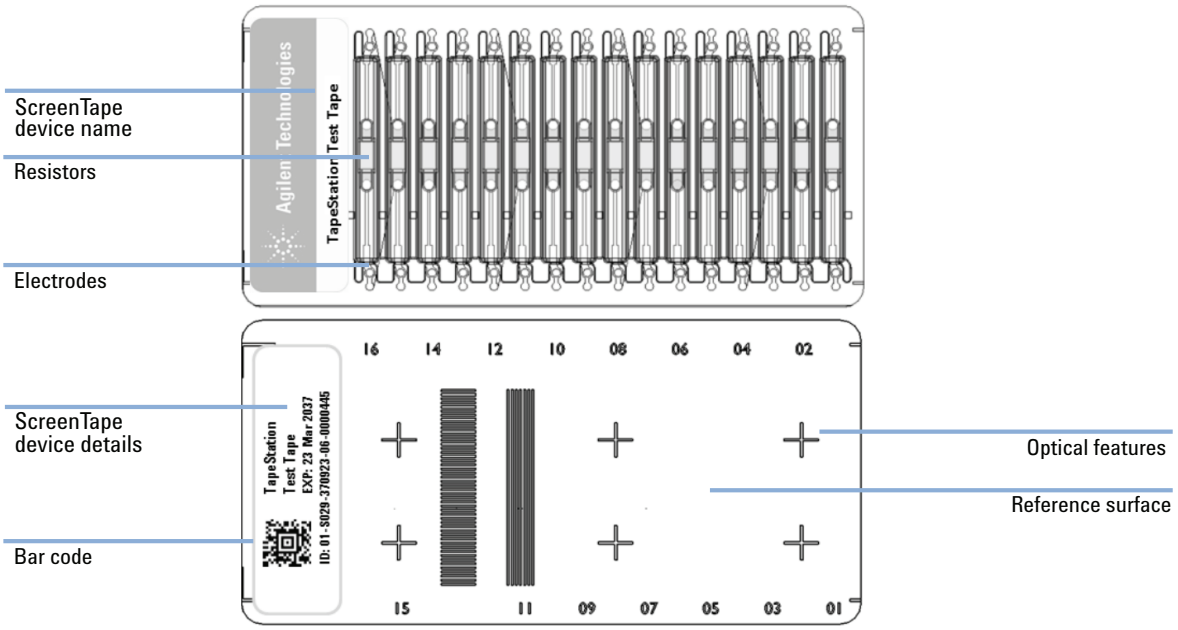


Figure 10 TapeStation Test Tape

Parts required	p/n	Description
	5067-5601	TapeStation Test Tape

NOTE Each TapeStation Test Tape has an operational life of 2 years.

NOTE Protect the Test Tape device from excessive force. Do not bend or flex the Test Tape device and store away from direct light and chemicals in the provided packaging when not in use.

1 Upgrade 2200 TapeStation Controller Software to the latest revision.

NOTE The TapeStation Test Tape can only be used on systems where the 2200 TapeStation Controller Software has been upgraded to version A.02.01 or higher.

The laptop utilized for performing any previous use(s) of the Test Tape device must be utilized for all further re-use.

2 Launch the Agilent 2200 TapeStation Controller Software.

3 Insert the TapeStation Test Tape device into the 2200 TapeStation instrument with the label towards the front of the instrument and the barcode facing right, then close the 2200 TapeStation instrument lid.

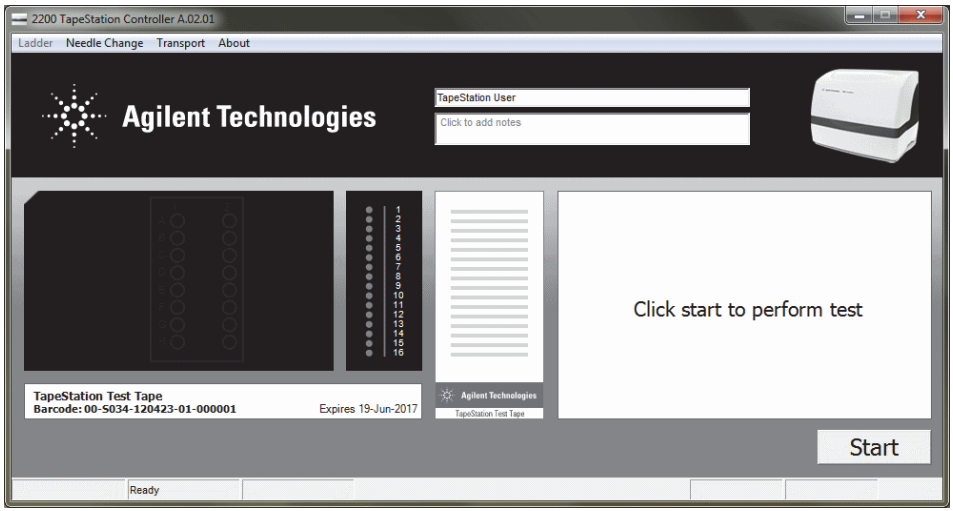


Figure 11 2200 TapeStation Controller Software image, TapeStation Test Tape

4 Click **Start**.

This will produce a **Save as** window for the PDF report.

As a default the file name starts with the date, in reverse order, and a run counter which auto increments if multiple Test Tape runs are completed on the same day.

NOTE The TapeStation Test Tape report can only be saved as a PDF file.
Please save your file to a safe place, where it can be accessed easily if needed for support purposes.

NOTE Lifting the lid of the 2200 TapeStation instrument after this time will abort the TapeStation Test Tape run.

5 Once the test is complete, the 2200 TapeStation Controller Software will display your TapeStation Test Tape results.

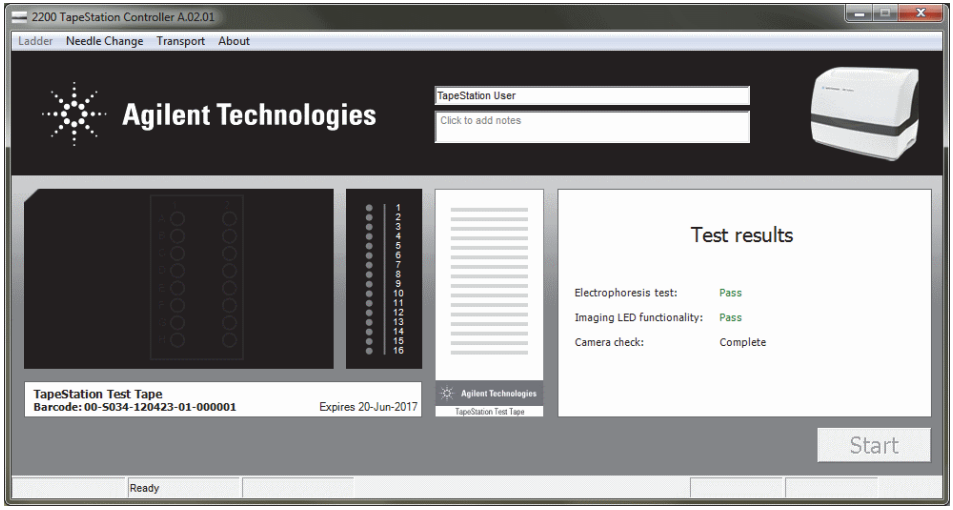


Figure 12 2200 TapeStation Controller Software showing TapeStation Test Tape 'Pass' result

6 Both the **Electrophoresis** test, and **Imaging LED functionality** test should display green **Pass** results. If this is not the case, please send the PDF results file to your local support representative for analysis.

6
Appendix

This chapter provides addition information.

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Sound Emission

Manufacturer's Declaration

This statement is provided to comply with the requirements of the German Sound Emission Directive of 18 January 1991.

This product has a sound pressure emission (at the operator position) < 70 dB.

- Sound Pressure Lp < 70 dB (A)
- At Operator Position
- Normal Operation
- According to ISO 7779:1988/EN 27779/1991 (Type Test)

Waste Electrical and Electronic Equipment Directive

Abstract

The Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC), adopted by EU Commission on 13 February 2003, is introducing producer responsibility on all electric and electronic appliances starting with 13 August 2005.

NOTE

This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category:

With reference to the equipment types in the WEEE Directive Annex I, this product is classed as a Monitoring and Control Instrumentation product.

NOTE

Do not dispose of in domestic household waste

To return unwanted products, contact your local Agilent office, or see http://www.agilent.com for more information.

Technical Service

For more information, please contact

Agilent Technologies UK Limited

e: www.agilent.com/genomics/contact

Index

www.agilent.com

In This Book

The manual describes the following:

- Introduction to the system
- Site requirements and specifications
- Installation
- Using the system
- Maintenance
- Product notices

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