Agilent

AriaMx Real-Time PCR System

Setup and User Guide

CE UKCA

G8830A AriaMx Real-Time PCR Instrument

For Research Use Only. Not for use in diagnostic procedures.

Version P1, August 2024

Notices

Manual Part Number

G8830-90001

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Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051 USA

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1 Before You Begin

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This chapter contains information for you to read and understand before you start setting up the instrument.

Overview of the AriaMx Real-Time PCR System

The AriaMx Real-Time PCR System is a fully integrated quantitative PCR amplification, detection, and data analysis system. The system design combines a state-of-the-art thermal cycler, an advanced optical system with an LED excitation source, and complete data analysis software. The instrument can hold up to six optical modules, and the scanning optics design delivers optimal separation between the dyes and between samples. The instrument provides a closed-tube PCR detection format that can be used with a variety of fluorescence detection chemistries including SYBR® Green and EvaGreen dyes as well as fluorogenic probe systems including TaqMan probes.

Materials provided with the AriaMx Real-Time PCR System

Table 1 Materials provided with p/n G8830A, AriaMx Real-Time PCR Bundle

Materials provided	Quantity
AriaMx instrument	1
Certificate of Conformity	1
China RoHS Addendum	1
Installation notice	1
Declaration of Conformity, European Union	1
Declaration of Conformity, United Kingdom	1
AriaMx installation poster	1
Power cord	1
Optical modules	Up to 6 optical modules, as selected by the user

The AriaMx instrument, the Certificate of Conformance, and the AriaMx installation poster are all shipped together in the same shipping container. The power cord and optical modules are each shipped in their own packaging.

The Aria Real-Time PCR Software (p/n G8830A-10001) is available for download from the Agilent website. See Chapter 3, "Installation of the Aria Software," on page 31.

Table 2 Materials offered as options at time of purchase

Options	Quantity
Electronic tracking (ET) software (p/n Option 300)	1
HRM analysis software (p/n Option 400)	1

Table 3 Materials offered after initial instrument purchase

Materials available	Quantity
Aria optical modules SYBR/FAM Optical Module (p/n G8830-67001) ROX Optical Module (p/n G8830-67002) HEX Optical Module (p/n G8830-67003) CY3 Optical Module (p/n G8830-67004) CY5 Optical Module (p/n G8830-67005) ATTO425 Optical Module (p/n G8830-67006)	As selected by the user
Electronic tracking (ET) software (p/n G5380AA)	1
HRM analysis software (p/n G5381AA)	1

Hardware specifications

Table 4 Hardware specifications for the AriaMx Real-Time PCR System

Feature	Specification
Excitation source	Eight dye-specific LEDs per optical module
Detection	Eight photodiodes per optical module
Dyes	ROX, FAM, HEX, CY5, CY3, ATTO425 Six slots, swappable optical modules, no reference channel needed
Electrical power (input)	100–240 VAC, 50/60 Hz, 1100VA
Thermal system	Peltier-based, 96-well block
Thermal system temperature range	25.0–99.9°C Max Heating: >6°C/sec Max Cooling: >2.5°C/sec Accuracy: ±0.2°C or better at typical annealing, amplification, and denaturation temperatures
Cycling speeds	40 cycle protocol in 43 minutes
Storage environment	10–43°C (50–109°F); 10–90% non-condensing humidity
Operating environment	20–30°C (68–86°F); 20–80% non-condensing humidity; maximum altitude of 2000 m
Weight	50 lbs (23 kg)
Dimensions	19.7" W × 18.1" D × 16.5" H (50 cm × 46cm × 42cm)
On board quality checks	Instrument QC checks: All checks: 30 minutes; Selected checks: 10–30 minutes
	Calibration: 1-minute background calibration
	Data loss prevention: Data captured from all channels on each scan Ability to store up to 5 GB on the instrument
Warranty	One-year warranty
Plastic consumables	Low-profile 0.2-ml tubes, strip tubes, and 96-well plates See “Recommended plasticware” on page 11 for part numbers

Recommended plasticware

Table **Table 5** lists the part numbers of Agilent plates, tubes, and other plastic consumables for use in the AriaMx instrument.

Table 5 QPCR plasticware for use in the AriaMx instrument

Agilent Part Number	Description
401490	96-well plate, fully skirted, low profile
401491	96-well plate, rigid, fully skirted, low profile
401494	96-well plate, non-skirted, low profile
401493	8x strip tubes, without caps, low profile, 120 strips (10 packs of 12 strips)
401425	8x strip tube optical caps, 120 strips (10 packs of 12 strips)
401427	8x strip tube optical caps, 60 strips (5 packs of 12 strips)
401492	Adhesive seal for 96-well plates, 50-pack *When sealing plates with adhesive seals, Agilent recommends using MicroAmp Optical Film Compression Pads (Thermo Fisher Scientific, part number 4312639).*

Safety precautions

Electrical

Standard electrical safety precautions should be applied, including the following:

- Always put the instrument in a location where, if needed, the power supply can be immediately disconnected.
- Proper voltage (100–240 VAC) must be supplied before you turn on the instrument for the first time.
- The device must be connected to a grounded socket. Do not operate the instrument from a power outlet that has no ground connection.
- Do not touch any switches or outlets with wet hands.
- Turn off the instrument before you disconnect the power cord.
- Unplug the instrument before you clean any major liquid spills and before you service any of the electrical or internal components.
- Do not connect the instrument to the same power strip as other high power-draw appliances (e.g., refrigerators and centrifuges).
- *Do not service the electrical components unless you are qualified to do so.*

Fluids and Reagents

- Fill reaction vessels outside the instrument so that no fluids penetrate the instrument.
- Never cycle or incubate explosive, flammable and reactive substances in the instrument.
- You must observe the relevant safety regulations when handling pathogenic material, radioactive substances or other substances hazardous to health.

- Do not submerge the instrument in any liquid.

Danger of Burns

- *Do not touch the thermal block, inner side of heated lid and reaction vessels*. These areas quickly attain temperatures of greater than 50°C. Keep the heated lid closed until temperatures of 30°C or lower are reached.
- Do not use any materials (plates, sealings, foils, mats) which are not sufficiently temperature-stable (up to 120°C).

Operating Environment

- The ventilation slots of the device must remain free to vent at all times. Leave at least 10 cm of space around the instrument.
- Keep the ambient temperature between 20°C and 30°C with humidity levels between 20% and 80% non-condensing.
- Do not operate the instrument in a hazardous or potentially explosive environment.
- Do not attempt to open the instrument door when the instrument is running an experiment.

Equipment Ratings

- Pollution degree 2
- Installation category II
- Altitude 2000 m
- Humidity 20 to 80%, non-condensing
- Electrical supply 100-240 VAC, 50/60 Hz, 1100VA
- Temperature 20°C to 30°C
- For Indoor Use Only

Electrostatic Discharge

The instrument is static sensitive. Electrostatic discharges greater than 8000 volts may interfere with the normal operation of the USB ports on the instrument. Handling precautions are required when working in high static environments. Wear a grounded wrist strap and take other antistatic precautions prior to making contact with the device in high static environments. ESD STM5.1-1998 Class 3B.

Safety Symbols

The electrical/safety symbols described below may be displayed on the instrument.

Power on

Power off

Caution

Caution, hot surfaces

Indicator LED light

On the front of the instrument (top right corner) is a status indicator LED. **Table 6** summarizes the status codes for this LED light.

Table 6 Appearance of the status indicator LED

Appearance	Instrument Status
Off	The instrument is idle.
Blinking green	The instrument is running.
Solid green	The instrument is paused.
Blinking red	The instrument has detected an error. Check the display for an error message containing further details.

Agilent Technical Support

Agilent Technical Support is available worldwide.

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Call (800)227-9770 (option 3,4,5)

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This chapter contains instructions for installing and setting up the AriaMx instrument.

Installing the AriaMx Instrument

Step 1. Select a location for the instrument

- Locate a solid, flat clean surface for the instrument. Make sure that:
  - The instrument can stand completely stable.
  - The rear air slots will not be covered.
  - The instrument has at least 10 cm (approximately 4 inches) to the next wall or neighboring instrument.
  - The instrument is not located near anything that could be a source of vibrations.
  - The temperature (normal ambient) is between 20°C and 30°C with humidity levels between 20% and 80% non-condensing.
  - The atmosphere is not explosive.

Step 2. Unpack the shipping containers

NOTE The AriaMx instrument is shipped in two separate containers. The small container holds the power cord. The large container holds the instrument and accessory tray.

Any optical modules that you ordered with the instrument are each packed and shipped separately in their own box.

1. Open the small shipping container that holds the power cord. Remove the power cord and set it aside for now.
2. Make sure that the large shipping container is in the upright position (**Figure 1**), then cut the four plastic straps that hold the container together.

Figure 1 AriaMx instrument shipping container

3 Open the top flaps of the large container.

Inside the container is an accessory tray (see **Figure 2**), which contains the Certificate of Conformity, the installation poster, and other documentation.

Figure 2 Opened shipping container with accessory tray sitting on top

4 Remove the accessory tray. Unpack the installation poster from the accessory tray and use it to guide you through the remainder of the unpacking process.

5 Remove the foam support that sits on top of the instrument in the shipping container.

6 Grip a handle on each side of the shipping container and lift up to remove the box sleeve that surrounds the instrument.

The instrument sits on the base of the shipping container, as shown in **Figure 3**.

Figure 3 Instrument on shipping container base, with box sleeve removed

7 Remove the plastic wrapping from the instrument.

8 Lift the instrument off of the shipping container base and set it down on its selected location (see **"Step 1. Select a location for the instrument"**).

Agilent recommends that two people lift the instrument together.

Step 3. Install the optical modules

1 Open the instrument door by lifting up on the handle on the top of the instrument. Lift the door all the way up and back.

2 Remove the piece of foam and then remove the strip of cardboard from around the thermal block assembly (see **Figure 4**). *Remember to retain these pieces, along with all other packaging materials, in the event that you need to ship the instrument for service.*

The optical module housing carrier is positioned to the left of the thermal block assembly.

Figure 4 Foam insert (left) and underlying cardboard strip (right).

3 Slide the optical module housing carrier to the right until it is centered in the opening of the instrument door (as shown in **Figure 5**). Use the indentation on the top of the carrier to help slide it.

Figure 5 Optical module housing carrier, centered in the instrument door opening

4 Open the lid on the optical module housing carrier.

a With your thumb and index finger, pinch together the two pieces of plastic in the indentation on the top of the carrier (see **Figure 6**).

b Lift the lid all the way back to reveal the six slots for the optical modules (see **Figure 7**).

Figure 6 Opening of the optical module housing

Figure 7 Slots for the optical modules

5 Open the boxes containing the optical modules. Remove the top piece of foam from each box (**Figure 8**) then remove the plastic bag containing the optical module.

Figure 8 Optical module shipping box – top piece of foam removed

6 Install the optical modules into the slots.

- **a** Open the plastic bag and remove the optical module.
- **b** Peel off the plastic film from the edge of the optical module (see **Figure 9**). Once the film is removed, do not to touch the exposed edge.
- **c** Put the optical module into an available slot in the optical module housing. The correct orientation for the optical module is label side up with the Agilent spark closer to the front of the instrument (see **Figure 10**).

NOTE If you are installing fewer than six optical modules, one or more of the slots in the optical module housing will be empty. In such cases, make sure that the empty slots are on the left-most side of the housing.

Figure 9 Removal of plastic film from optical module

Figure 10 Installed optical modules

7 Lower the lid on the optical module housing until it clicks shut.

When you turn on the instrument for the first time, it will prompt you to calibrate the background for the optical modules. Calibration is described in "Step 1. Turn on the instrument and calibrate the background for the optical modules" on page 25.

Anytime a new optical module is installed, perform a system verification prior to running an assay. See "Verifying performance of the AriaMx Real-Time PCR System" on page 57.

Step 4. Clean the thermal block

With the instrument door still open, clean the outside and inside surfaces of the thermal block.

1 Lift the lid of the thermal block by pulling forward on the handle of the lid and then lifting the lid up and away from the thermal block.

2 Using an aerosol can of compressed air, clean out the wells of the thermal block. Hold the can 3–4 inches away from the thermal block as you press the trigger.

3 Moisten a lint-free cleansing tissue with dH_20, and gently wipe down the thermal block and the underside of the lid. Then, close the lid of the thermal block and wipe down the top of the lid.

4 Close the instrument door.

Step 5. Connect the instrument to a power supply

You must connect the instrument to a grounded AC outlet.

1 Plug the power cord into the power connector at the rear of the instrument.
See "Electrical" on page 11 for information on electrical safety precautions.

2 Connect the cable plug to the outlet.

Step 6. Connect a keyboard or mouse to the instrument (optional)

If desired, you can connect a keyboard or mouse to the instrument via the USB ports on the front and back of the instrument.

- Plug the USB cable of the device into a USB port on the instrument.
  Multimedia keyboards are not supported.

Step 7. Connect the instrument to a network or directly to a PC

Connecting your instrument to a PC, either directly or though a network, allows you to remotely retrieve data from the instrument to your PC through the Aria PC software. If you do not connect your instrument to a PC or network, you must transfer post-run experiment data by copying it from the instrument to a USB drive (FAT format), and then from the USB drive to your PC.

NOTE Using the Aria PC software to remotely connect to an AriaMx instrument, either via a network connection or a direct PC connection, requires a reliable network and proper setup of the AriaMx instrument during installation. Work closely with your IT administrator to ensure your network configuration is properly set up. In cases where an unstable network is suspected, avoid using remote connection until network reliability has been confirmed by your IT administrator. Reconfirm the stability of your network connection anytime the AriaMx instrument is moved to a new location, a new IP address is assigned, or the network experiences a power outage.

Signs of a poor network connection may include the following.

- Self-assigned IP address on the AriaMx instrument in the form 169.254.x.y
- Difficulty connecting to an AriaMx instrument
- Loss of connection to a previously connected instrument, connectivity timeouts, or similar connection errors

To connect the instrument to a network

1 Plug one end of an ethernet cable into the ethernet port on the back of the instrument. Use a standard Cat 6 straight ethernet cable.

2 Plug the other end of the cable into a network port.

3 Verify that the IP address assigned to the AriaMx instrument is not of the form 169.254.x.y. An IP address of that format is indicative of a poor network connection.
To view the IP address, press the network icon in the bottom right corner of the touchscreen. The menu that opens lists the IP address assigned to the AriaMx instrument (**Figure 11**).

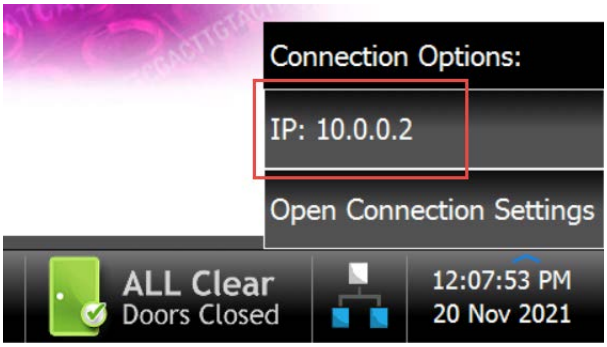

Figure 11 IP address display

To connect the instrument directly to a PC and configure network settings

1 Plug one end of an ethernet cable into the ethernet port on the back of the instrument. Use a standard Cat 6 straight ethernet cable.

2 Plug the other end of the cable into the PC.

3 After you turn on the AriaMx instrument, set a static IP address, subnet mask, and default gateway on the instrument using the instructions below.

You will need to wait to complete these steps until after you complete "Step 1. Turn on the instrument and calibrate the background for the optical modules" on page 25.

a On the Home screen of the AriaMx touchscreen, press **Settings**.

b Press **Connection Settings**. If you see an error message that no network connection is detected, press **OK** to close the error message.

c On the Connection Settings screen, select **Use Manual Configuration**.

d In the IP Address, Subnet Mask, and Default Gateway fields, enter the values shown in **Figure 12**. Press **OK**.

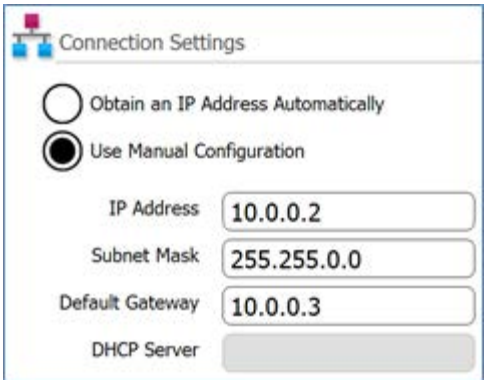

Figure 12 Connection Settings

4 On the PC, set a static IP address, subnet mask, and default gateway using the instructions below.

a Open the Control Panel for Windows.

b Under **Network and Internet**, click **View network status and tasks** (**Figure 13**).

The Network and Sharing Center Window opens, displaying your active network connections (**Figure 13**). Note that the appearance of the Network and Sharing Center screen may differ slightly from that shown in **Figure 13** depending on your current network setup.

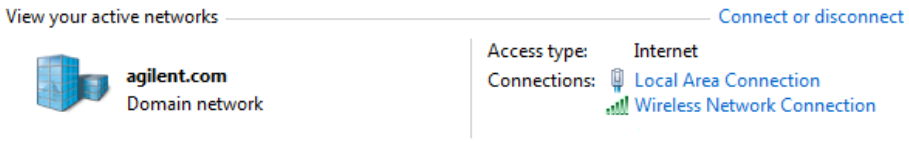

Figure 13 Network and Sharing Center – View your active networks

c For the network domain, click **Local Area Network**.

The Local Area Connection Status dialog box opens.

d In the Local Area Connection Status dialog box, click **Properties**.

The Local Area Connection Properties dialog box opens

e In the list of items under **This connection uses the following items**, double-click **Internet Protocol Version 4 (TCP/IPv4)** (**Figure 14**).

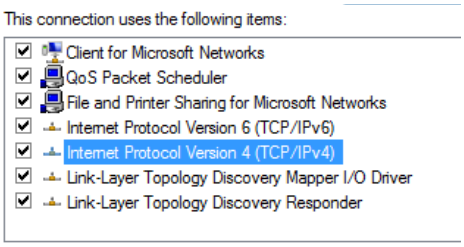

Figure 14 Local Area Connection Properties dialog box – Internet Protocol Version 4

The Internet Protocol Version 4 (TCP/IPv4) Properties dialog box opens.

f On the General tab of the dialog box, select **Use the following IP address** and set the IP address, subnet mask, and default gateway to the values shown in **Figure 15**. Click **OK** to close the dialog box.

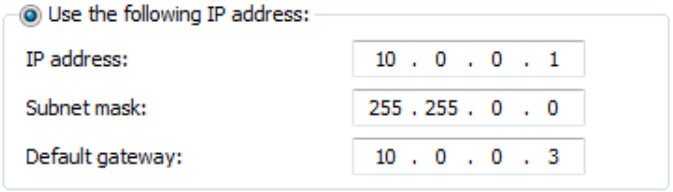

Figure 15 Internet Protocol Version 4 dialog box – Use the following IP address

Setting Up the AriaMx Instrument

Step 1. Turn on the instrument and calibrate the background for the optical modules

1 Press the power button located near the bottom left corner on the front of the instrument.

The instrument performs a series of health checks to ensure basic hardware functionality. If the health checks reveal an instrument error, record the error and then perform a more detailed diagnostic check (see "Step 3. Run a diagnostic check" on page 26). The instrument performs the health checks each time it is powered on. When the tests are complete, the instrument touchscreen opens to the Home screen.

Anytime you install new optical modules, a message box opens prompting you to calibrate the background for the optical modules.

2 Press **OK** in the message box.

The Background Calibration screen opens.

3 Press **Calibrate**.

A message box opens instructing you to load a 96-well QPCR plate containing 20 µl of dH_20 or TE buffer in each well onto the thermal block.

4 Prepare the plate and load it into the thermal block. Close the instrument door and press **OK** in the message box.

See "Load samples" on page 58 for instructions on plate loading. See "Recommended plasticware" on page 11 for ordering information on 96-well plates. Additional details on plate preparation are provided in "Calibrate the background" on page 66.

The instrument runs the calibration. At the end of calibration, a message box opens on the touchscreen notifying you that the calibration was successful.

5 Click **OK** in the message box to close it.

The touchscreen returns to the Home screen. You are logged in to the *Guest* account.

Figure 16 Touchscreen display – Home screen

The color touchscreen on the AriaMx instrument allows you to operate the instrument by touching the buttons on the screen. If a mouse has been connected to the instrument, you may select buttons by clicking. When software functions require data input from a keyboard, the touchscreen automatically displays a virtual keyboard. You can also type in data input using a USB-connected keyboard.

Step 2. Set the instrument date and time

1. In the bottom right corner of the touchscreen, press the time and date this is currently displayed.
2. In the menu that opens, press **Change Date & Time**.
   The Date & Time Settings screen opens.
3. Use the fields to set the date and time to the correct values. Press the help icon for detailed instructions on setting the date and time on this screen.

Step 3. Run a diagnostic check

1. On the Home screen of the touchscreen, press **Settings**.
2. Press **Instrument Diagnostic**.
3. Press **Run Diagnostics**.
4. Mark the check box at the top of the screen labeled **All Test**.
5. Press **Run**.

A message box opens prompting you to make sure that no plate is loaded on the thermal block.

6 Press **OK** to continue.

A dialog box opens displaying a schematic of the optical modules installed in the housing.

7 Mark the check boxes for all slots in the housing that contain an optical module. For empty slots, leave the check box clear. Press **OK**.

The instrument begins running the diagnostic check. The first set of tests is the user interaction tests.

8 During the user interaction tests, perform all actions and answer questions as prompted on the touchscreen.

After the user interaction tests, the instrument runs the diagnostic tests. No user input is required during this set of tests.

At the end of the diagnostic check, the touchscreen opens to the Diagnostic Report screen.

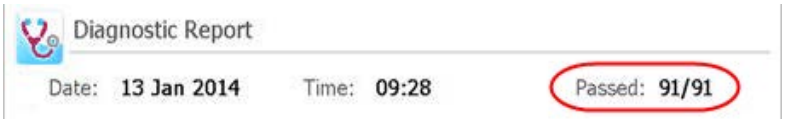

Figure 17 Diagnostic report banner, with the test results circled in red

9 Check the diagnostic report. The banner at the top of the report lists the number of tests that passed out of the total number of test performed (see **Figure 17**).

- If all tests passed, you can close the diagnostic report.
- If any of the tests failed, contact Agilent Technical Support. See page 14 for contact information.

Logging In and Creating User Accounts

The AriaMx instrument offers individualized user accounts, allowing each AriaMx user to log in to the instrument with their own account and save experiments to their own user folder. Three different access levels are available for user accounts: Administrator, User, and Guest. Each level has specific user rights as described in Table 7.

Table 7 Access levels

Access Level	Functions allowed
Guest	• Access rights to the Guest folder
User	• Access rights to the Guest and personal user folder
Administrator	• Access rights to the Guest folder and all user folders • Creation and management of user accounts • Installation of instrument software updates • Access rights to the instrument diagnostic reports

Each time you turn on the instrument, you are automatically logged in to the *Guest* account. Use of the *Guest* account is not recommended for organizations that prioritize file security.

Step 1. Log in to the instrument using an Administrator account

1 From the Home screen of the touchscreen, press **User Login**. Alternatively, from any screen of the touchscreen, press **Current User** at the bottom of the screen, then press **Open Login Page**.

The User Login screen opens.

2 In the User Name drop-down, select the user name for an account that has Administrator access level.

The instrument comes preloaded with a default Administrator account that you can select here.

3 In the Password field, type the password for the account.

The default password for the Administrator user name is ADMIN.

4 Press **Login**.

A message box opens confirming that you logged in to the instrument. Press **OK** to close the message box.

5 (Optional) Change the default password for the Administrator account.

CAUTION Agilent cannot recover lost passwords for the Administrator account. Make careful note of the new password.

a From the Home screen, press **Settings**.

b Press **User Management**.

c On the User Management screen, select the Administrator account and press **Edit**.

d In the Password and Confirm Password fields, type a new password for the account.

e Press **OK** to save the new password.

Step 2. Add user accounts

1 From the Home screen, press **Settings**.

2 Press **User Management**.

The User Management screen opens listing the available user names and corresponding access levels.

3 Press **Add**.

The Add User screen opens.

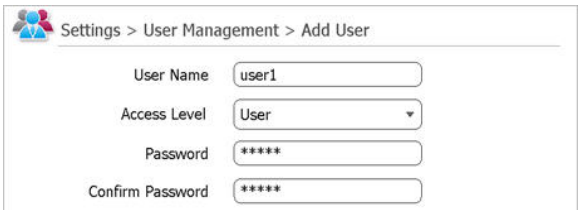

Figure 18 Add User screen

4 In the User Name field, type a user name.

5 In the Access Level drop-down list, select an access level for the account. The options are Administrator and User.

See **Table 7** on page 28 for a description of access levels.

6 In the Password and Confirm Password fields, type a password for the account.

7 Press **OK** to save the account.

A message box opens confirming the creation of the new account. Click **OK** to close the message box. You are returned to the User Management screen.

8 Repeat **step 3** through **step 7** for any additional user accounts that you want to create.

Step 3. Log in to your personal user account

Logging in to your personal account allows you to access your user folder. If you are logged in as *Guest*, you must save the experiment to the Guest folder.

1 From the Home screen of the touchscreen, press **User Login**. Alternatively, from any screen of the touchscreen, press **Current User** at the bottom of the screen, then press **Open Login Page**.

The User Login screen opens.

2 In the User Name drop-down, select your user name. In the Password field, type the password for the account.

3 Press **Login**.

A message box opens confirming that you logged in to the instrument. Press **OK** to close the message box.

To log out, press **Current User** at the bottom of any screen, then press **Log Out**.

Customizing Instrument Settings

You can access a variety of instrument settings using the buttons on the Settings screen of the touchscreen. Each button takes you to a different screen in the touchscreen software. From each screen, press the Help icon for more information on the settings available.

Table 8 Buttons on the Settings screen

Button	Description
	**User Management** – Opens the User Management screen, which has tools for creating and managing user accounts. This screen can only be accessed when an Administrator user is logged in to the instrument.
	**System Settings** – Opens the System Settings screen, which has tools for accessing and managing instrument settings including date/time, optical module information, PC connections, experiment resumption, instrument name and calibration processes.
	**Software Updates** – Displays software version information for the instrument. An Administrator user can use this screen to update the AriaMx instrument software.
	**Hot Top Settings** – Use this button to enable or disable the instrument hot top.
	**Connection Settings** – Displays the IP address and other network information for the instrument.
	**Instrument Diagnostic** – Opens the Diagnostic Test screen, which contains buttons for running instrument troubleshooting tests and viewing and reporting the results. See "Open the diagnostic report" on page 70.
	**Calibrate Touch** – Use this button to calibrate the touchscreen. The calibration screen instructs you to touch a marker (+) appearing on the screen in order to calibrate the touchscreen response functions.

3 Installation of the Aria Software

Minimum requirements for running the Aria software 32
Installing the Standard Aria Software 33
Download the Aria software 33
Install the Aria software 33
Launch the Aria software 39
Installing the Aria ET (Electronic Tracking) Software 40
Download the Aria software and Microsoft SQL Server 2019 40
Install Microsoft SQL Server 2019 41
Install the Aria ET software 45
Configure and start Microsoft Distributed Transaction Coordinator (MSDTC) service 51
Launch the Aria ET software 53
Installing Microsoft .NET Framework 4.8 55

This chapter contains installation instructions for installing the Aria software on your PC.

Minimum requirements for running the Aria software

Before installing the Aria software, see **Table 9** for the minimum PC requirements needed to run the software.

For the most current information on Aria PC software requirements, see the AriaMx software download page at **www.agilent.com/en/product/real-time-pcr-(qpcr)/real-time-pcr-(qpcr)-instruments/ariamx-software-download**.

Table 9 Minimum requirements for running the Aria software

Supported operating systems	Windows 11 Pro, 64 bit – with regional format set to English (United States)
Programs*	Microsoft .NET Framework 4.8 Microsoft SQL Server 2019 (required for ET software only) Runtime components of Microsoft Visual C++ 2022 Libraries
Processor	2 GHz Dual Core Processor
Working memory (RAM)	2 GB (more is recommended)
Storage	40 GB available disk space
Display resolution	1024 × 768 (1280 × 1024 is recommended)

* Installers for Microsoft .NET Framework 4.8 and Microsoft SQL Server 2019 are provided on the AriaMx Software Download page of the Agilent website (see "Installing Microsoft .NET Framework 4.8" on page 55 and "Install Microsoft SQL Server 2019" on page 41). If you do not have the needed Microsoft Visual C++ components, then the Aria installer will automatically install them to your PC when you initiate installation of the Aria software.

Installing the Standard Aria Software

NOTE The instructions in this chapter are for the installation of the standard Aria software. If you purchased the optional Electronic Tracking software – which include user authentication, database data storage, and audit trail support – use the instructions in "Installing the Aria ET (Electronic Tracking) Software" on page 40.

If you connected your instrument directly to a PC, install the software on that PC. If you connected your instrument to a network, install the software on a network PC. You can install the standard Aria software on an unlimited number of PCs.

Before starting the installation, make sure your PC meets the minimum requirements needed to run the Aria software. See **Table 9** on page 32 for a list of the minimum requirements.

Download the Aria software

NOTE When upgrading the Aria PC software, also upgrade the instrument software (firmware) so that both software packages have the same version number. This ensures that you can continue to connect to the instrument from your PC.

To download the installer for the Aria software:

1. Go to the AriaMx Software Download website at **www.agilent.com/en/product/real-time-pcr-(qpcr)/real-time-pcr-(qpcr)-instruments/ariamx-software-download**.
2. Under Aria Software Download, click the link for the latest version of the software.
   The software request page opens in a new tab or window of your internet browser.
3. Complete the fields on the page and click **Submit**.
   The page updates to provide a link for downloading the firmware software and a link for downloading the Aria software.
4. Click the link to download the Aria software.
5. Save the Installer to your computer. The Installer is named *Agilent Aria Software Setup X.X.exe* (where X.X is the software version).

Install the Aria software

To install the Aria software:

1. Double-click the file called *Agilent Aria Software Setup X.X.exe* (where X.X is the software version).
   The Aria software installation wizard starts. Following the file extraction process, the wizard opens to the Welcome window.

NOTE

If you receive an error message stating that Microsoft .NET Framework 4.8 needs to be installed, you must cancel the installation and install Microsoft .NET Framework 4.8 first. To cancel the AriaMx installation, click **OK** in the error message box, then click **Finish** in the installation wizard.

See "Installing Microsoft .NET Framework 4.8" on page 55 for instructions on installing Microsoft .NET Framework 4.8.

Figure 19 Agilent Aria installation wizard – Welcome window

2 Click **Next** to continue with the installation.
The License Agreement window opens.

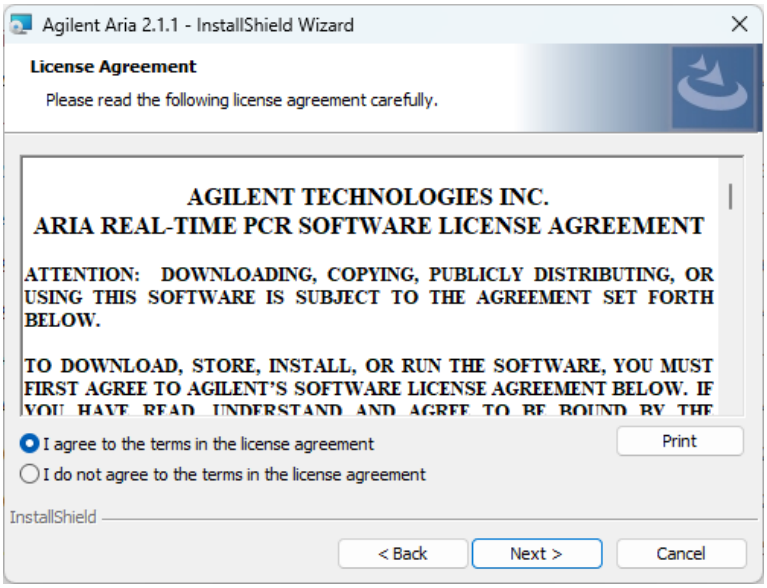

Figure 20 Agilent Aria installation wizard – License Agreement window

3 If you accept the terms of this agreement, select **I agree to the terms in the license agreement** and click **Next**. (If desired, click **Print** before clicking **Next** to print a copy of the license agreement.)

The Application Mode window opens.

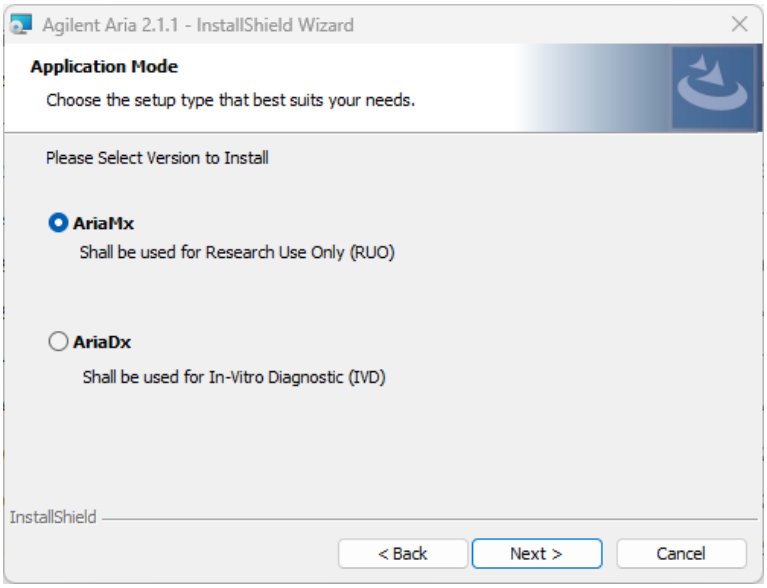

Figure 21 Agilent Aria installation wizard – Application Mode window

4 In the Application Mode window, select AriaMx, then click **Next**.

The Setup Type window opens.

NOTE The AriaMx mode of the software is only compatible with the AriaMx instrument. The AriaDx mode of the software is only compatible with the AriaDx instrument.

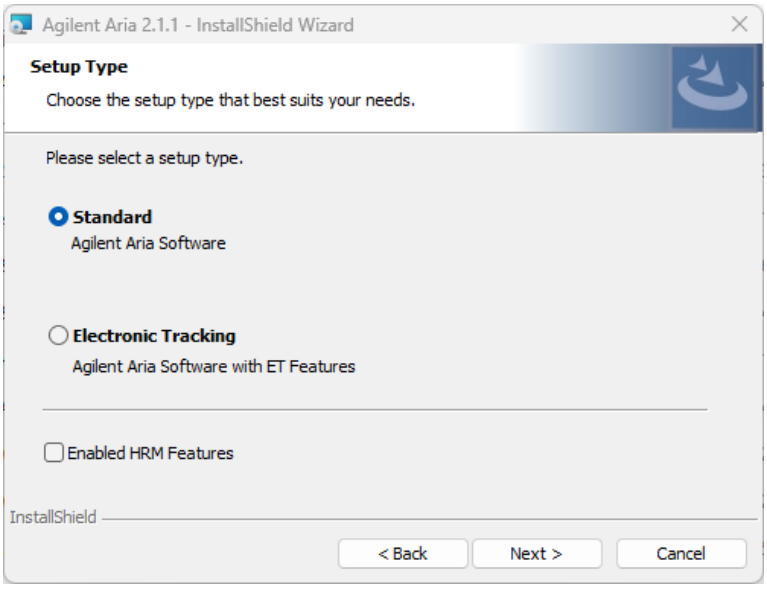

Figure 22 Agilent Aria installation wizard – Setup Type window

5 In the Setup Type window, Standard is selected by default. Leave this default selection in place.

6 Make a selection for the software's HRM features. The HRM features allow full access to the graphical displays for experiments that use high resolution melt (HRM) analysis. Enabling the HRM features requires a separate license that can be purchased from Agilent.

- If you have purchased an HRM license and want to enable the HRM features in the Aria software, mark the check box labeled Enabled HRM Features and click **Next**. The Software Activation window opens. Proceed to **step 7** below.
- If you do not want to enable the HRM features in the Aria software, do not mark the check box labeled Enabled HRM Features. Click **Next**. The Destination Folder window opens. Proceed to **step 9**.

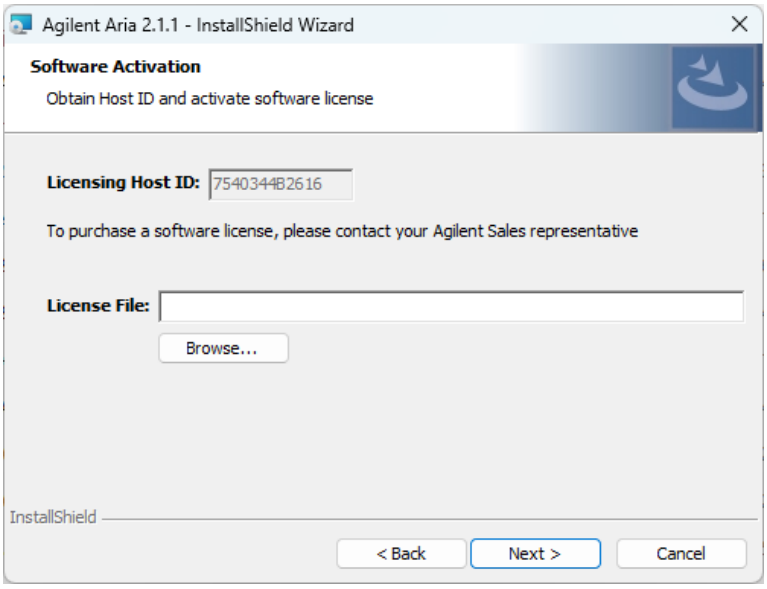

Figure 23 Agilent Aria installation wizard – Software Activation window

7 The Software Activation window displays the Licensing Host ID. Follow the instructions provided on your Software Entitlement Certificate to use this Licensing Host ID to redeem your HRM license and save the file to your PC. Then, in the Software Activation window, click **Browse** to open a dialog box where you can browse to the folder containing the HRM license file. Select the file and click **Open**.

The dialog box closes and you are returned to the Software Activation window.

8 Click **Next**.

The Destination Folder window opens.

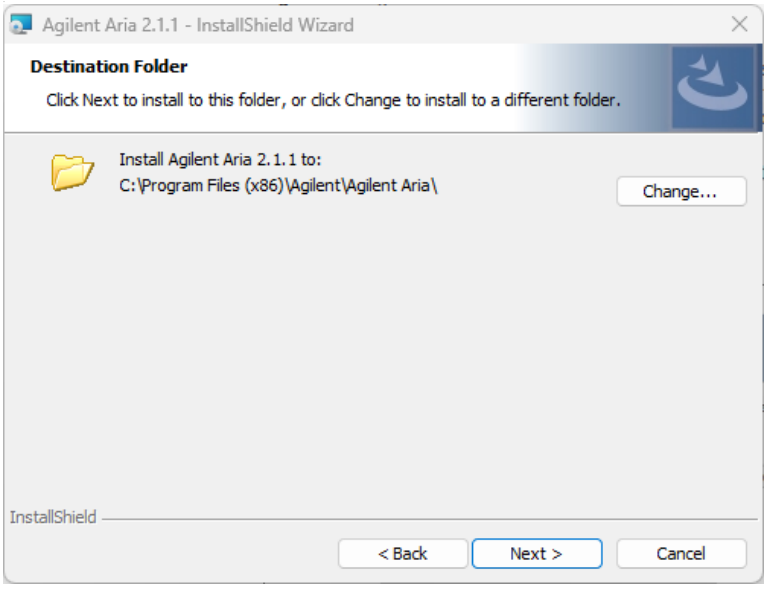

Figure 24 Agilent Aria installation wizard – Destination Folder window

9 Designate a folder for the software files. The default folder is C:\Program Files (x86)\Agilent\Agilent Aria.

- If you want to install the software to the default folder, click **Next** to continue.
- If you want to designate a different folder, click **Change** in the Destination Folder window. In the dialog box that opens, browse to the desired folder, select the folder, and click **Open**. Then, in the Destination Folder window, click **Next** to continue.

The Ready to Install window opens.

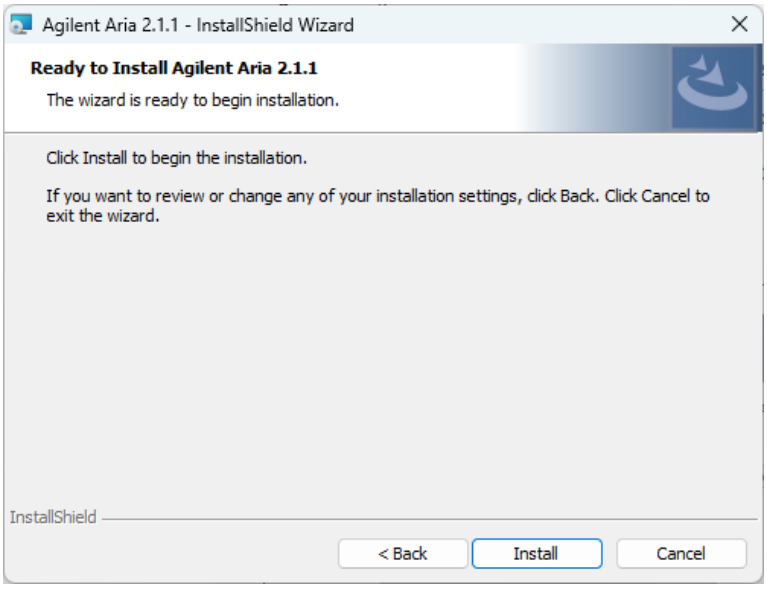

Figure 25 Agilent Aria installation wizard – Ready to Install window

10 Click **Install**.

The wizard installs the Aria software to the folder designated in **step 9**. When installation is complete, the InstallShield Wizard Completed window opens.

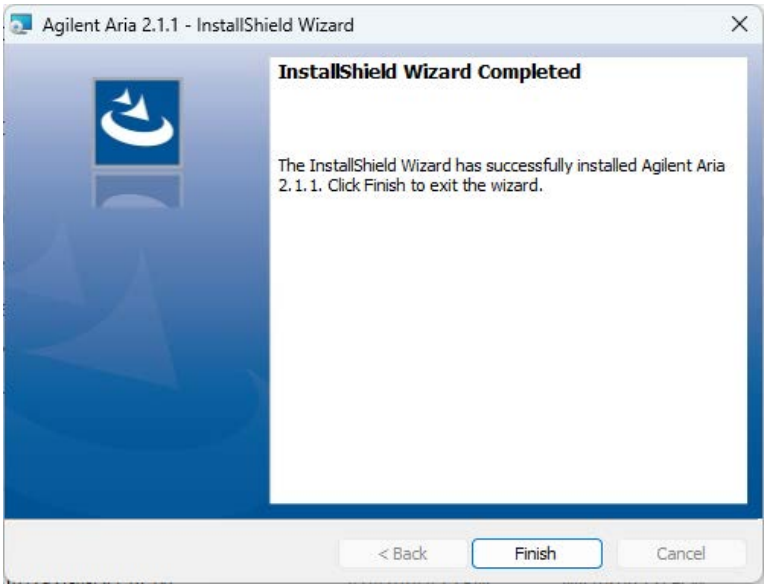

Figure 26 Agilent Aria installation wizard – InstallShield Wizard Completed window

11 Click **Finish** to close the wizard.

Launch the Aria software

After installation is complete, the software is ready to launch.

To launch the Aria software:

- From the Start menu, click **All Programs > Agilent > Agilent AriaMx > Agilent AriaMx X.X** (where X.X is the software version).

  The software opens to the Getting Started screen.

NOTE

During installation, a set of sample experiments (**.amxd*) and sample templates (**.amxt*) were saved to the following folders.

C:\Users\Public\Public Documents\Agilent Aria\Sample Experiments
C:\Users\Public\Public Documents\Agilent Aria\Experiment Templates

You can now open these files in the Aria software.

Installing the Aria ET (Electronic Tracking) Software

NOTE The instructions in this chapter are only suitable if you purchased the Aria ET (electronic tracking) software, which provides audit trailing, data tracking, and secure application logins. If you did not purchase the ET version of the software, see the installation instructions in "Installing the Standard Aria Software" on page 33.

Make sure your PC meets the minimum requirements needed to run the Aria software. See **Table 9** on page 32 for a list of the minimum requirements.

Download the Aria software and Microsoft SQL Server 2019

If you are an existing AriaMx user and you are upgrading from Microsoft SQL Server 2012 to Microsoft SQL Server 2019, make sure to back up your existing Aria database before downloading SQL Server 2019 (see instructions on the AriaMx Software Download website under **Additional Resources**). After installation of SQL Server 2019 is complete, restore the backed up database to maintain access to your data.

NOTE When upgrading the Aria PC software, also upgrade the instrument software (firmware) so that both software packages have the same version number. This ensures that you can continue to connect to the instrument from your PC.

To download the installers for the Aria software and the Microsoft SQL Server 2019 software:

1. Go to the AriaMx Software Download website at **www.agilent.com/en/product/real-time-pcr-(qpcr)/real-time-pcr-(qpcr)-instruments/ariamx-software-download**.
2. Under Aria PC Software requirements, click **Server set up software for Electronic Tracking software upgrade**.
3. Save the Installer to your computer. The Installer is named *Agilent.Aria.SQLServer2019Setup.exe*.
4. Under **Aria Software Download**, click the link for the latest version of the software.

   The software request page opens in a new tab or window of your internet browser.
5. Complete the fields on the page and click **Submit**.

   The page updates to provide a link for downloading the firmware software and a link for downloading the Aria software.

   For optimal performance, always run the latest available versions of both the firmware software and the Aria software, and make sure that the versions match.
6. Click the link to download the Aria software.
7. Save the Installer to your computer. The Installer is named *Agilent Aria Software Setup X.X.exe* (where X.X is the software version).

Install Microsoft SQL Server 2019

The Aria ET software uses SQL Server for storage of the databases. Install SQL Server prior to installing the Aria ET software.

NOTE You can install SQL Server on a different PC than the Aria ET software provided that the two PCs are on the same network domain. Importantly, the Aria ET PC and the SQL Server PC need to be joined to the same domain prior to installation of the Aria ET software. Your network administrator can help you join the PCs to the same domain.

To install SQL Server:

8 Double-click the file called *Agilent.AriaMx.SQLServer2019Setup.exe*.
The AriaMx SQL Server installation wizard opens.

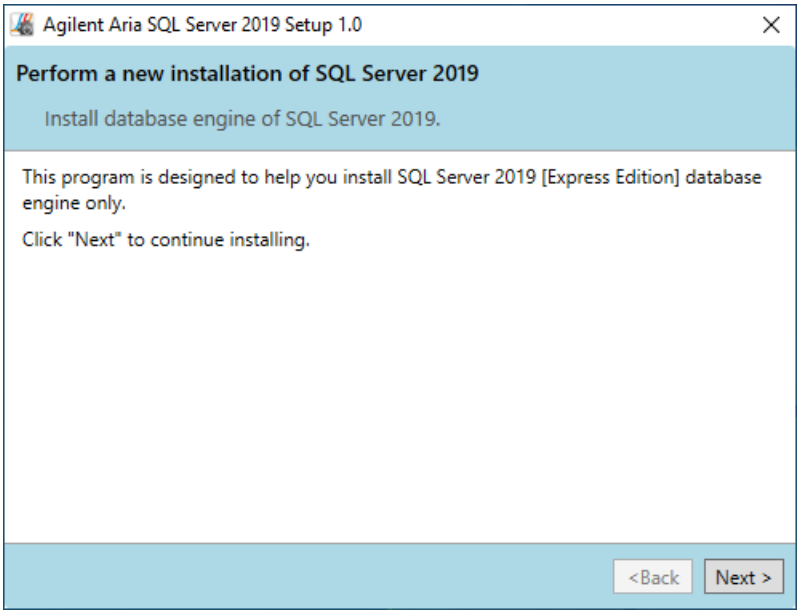

Figure 27 AriaMx Microsoft SQL Server 2019 installation wizard

9 Click **Next** to continue.
The License Agreement window opens.

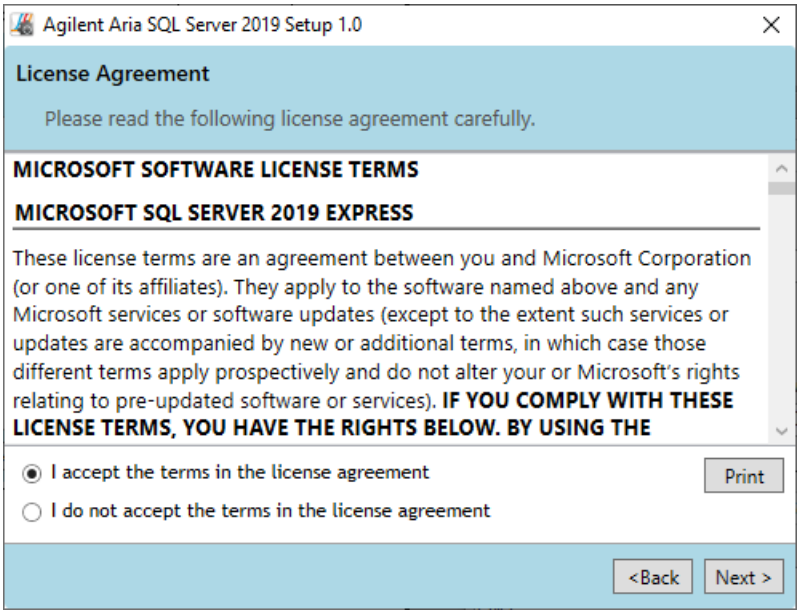

Figure 28 AriaMx Microsoft SQL Server 2019 installation wizard – License Agreement window

10 If you accept the terms of this agreement, select **I accept the terms in the license agreement** and click **Next**. (If desired, click **Print** before clicking **Next** to print a copy of the license agreement.)

The Instance Configuration window opens.

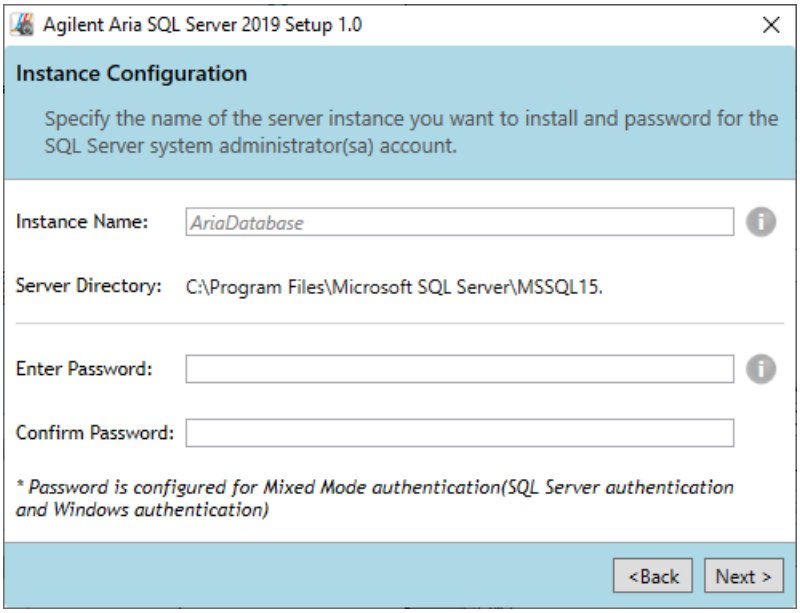

Figure 29 AriaMx Microsoft SQL Server 2019 installation wizard – Instance Configuration window

11 In the Instance Name field of the Instance Configuration window, type a name for the server instance you want to install. Hover your cursor over the Information icon next to the field to see guidelines on selecting a valid instance name.

12 In the Enter Password field, type a password for the server instance. Hover your cursor over the Information icon next to the field to see guidelines on selecting a valid password. Type the password again in the Confirm Password field.

13 Click **Next** in the Instance Configuration window.

The Ready to Install window opens.

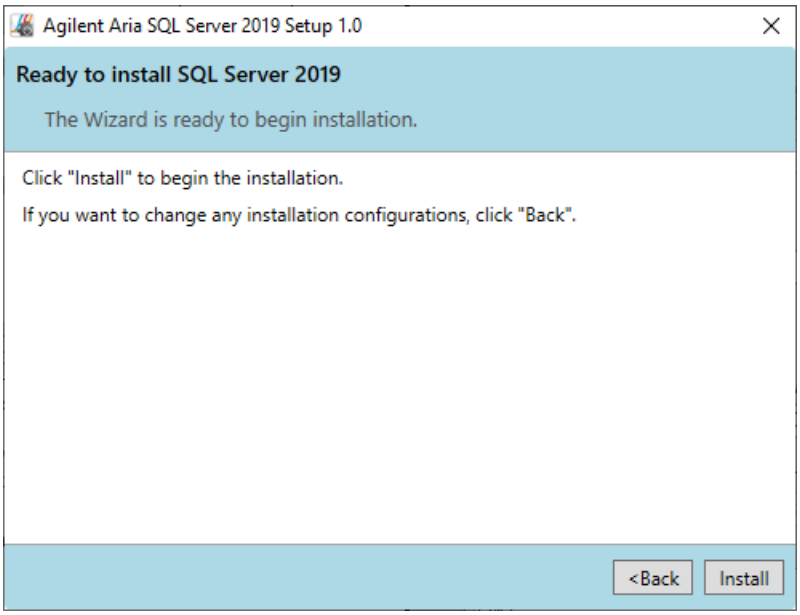

Figure 30 AriaMx Microsoft SQL Server 2019 installation wizard – Ready to Install window

14 Click **Install**.

The Installing window opens and remains open until installation is complete.

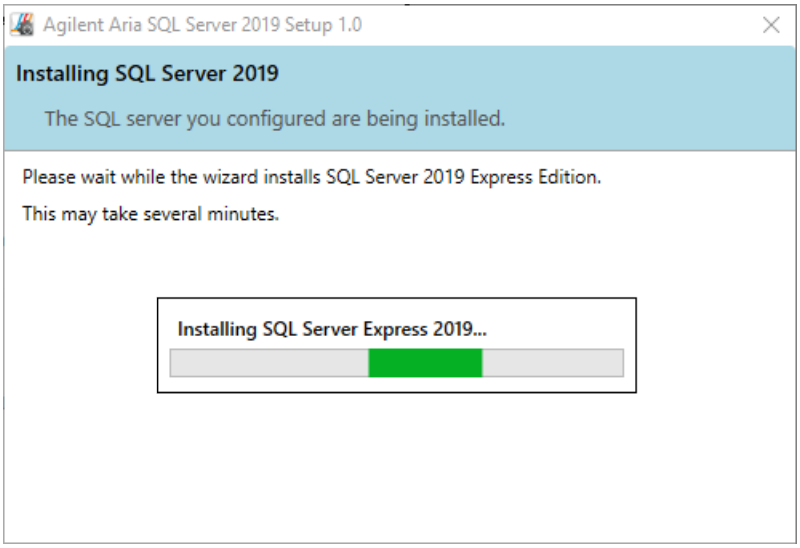

Figure 31 AriaMx Microsoft SQL Server 2019 installation wizard – Installing window

When installation is complete, the SQL Server 2019 Installation Completed window opens.

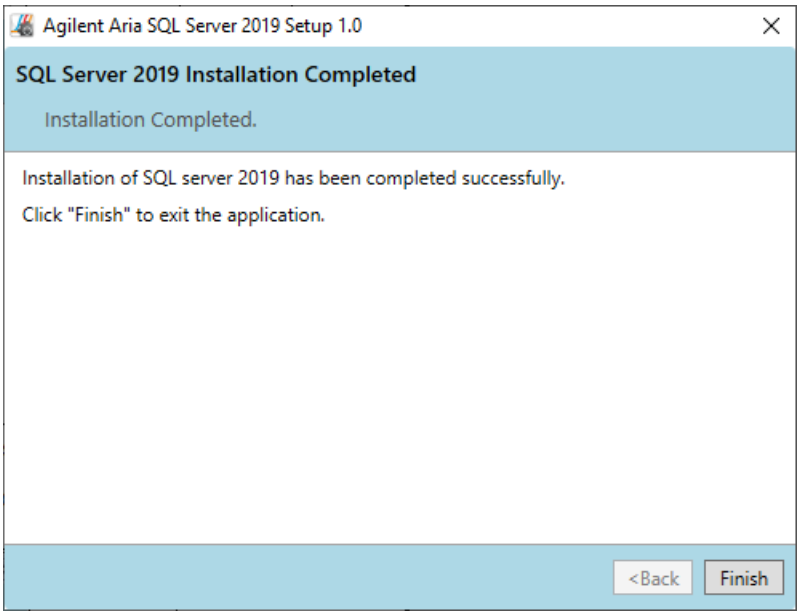

Figure 32 AriaMx Microsoft SQL Server 2019 installation wizard – SQL Server 2019 Installation Completed window

15 Click **Finish** to close the wizard.

Install the Aria ET software

Installation of the Aria ET software requires Microsoft .NET Framework and connection to Microsoft SQL Server. If you encounter one or more of the following potential errors when attempting to install the Aria ET software, follow the recommended action to resolve the error.

Table 10 Aria ET installation errors

Error message summary	Recommended action
Microsoft .NET Framework 4.8 needs to be installed	Cancel the installation of the Aria software and install Microsoft .NET Framework 4.8 first. See "Installing Microsoft .NET Framework 4.8" on page 55.
Could not connect to Microsoft SQL Server -- OR -- Windows could not start the SQL Server on Local Computer	Refer to troubleshooting guidance from Microsoft available at **https://learn.microsoft.com/en-us/troubleshoot/sql/database-engine/database-file-operations/troubleshoot-os-4kb-disk-sector-size.** You may need to work with your organization's Information Technology group and/or Microsoft Technical Support to resolve the issue.

To install the Aria ET software:

1 Double-click the file called *Agilent Aria Software Setup X.X.exe* (where X.X is the software version).

The Aria software installation wizard starts. Following the file extraction process, the wizard opens to the Welcome window.

Figure 33 Agilent Aria installation wizard – Welcome window

2 Click **Next** to continue with the installation.

The License Agreement window opens.

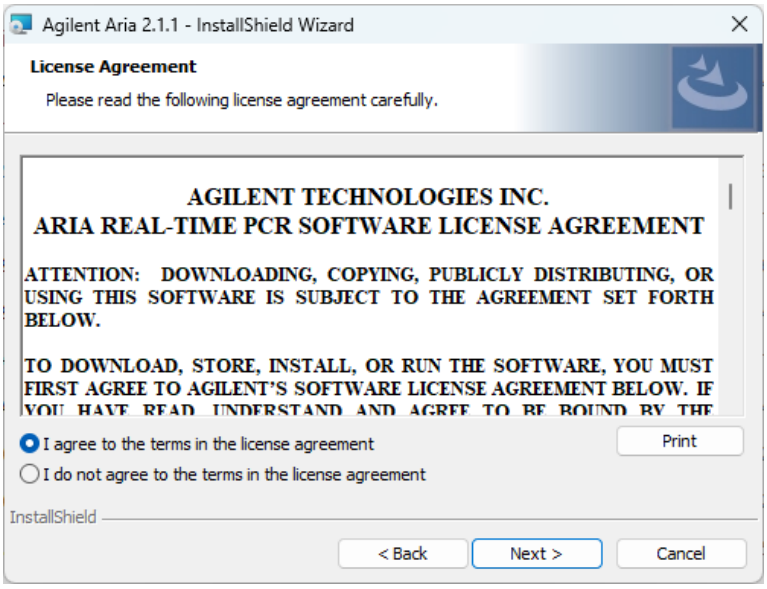

Figure 34 Agilent Aria installation wizard – License Agreement window

3 If you accept the terms of this agreement, select **I agree to the terms in the license agreement** and click **Next**. (If desired, click **Print** before clicking **Next** to print a copy of the license agreement.)

The Application Mode window opens.

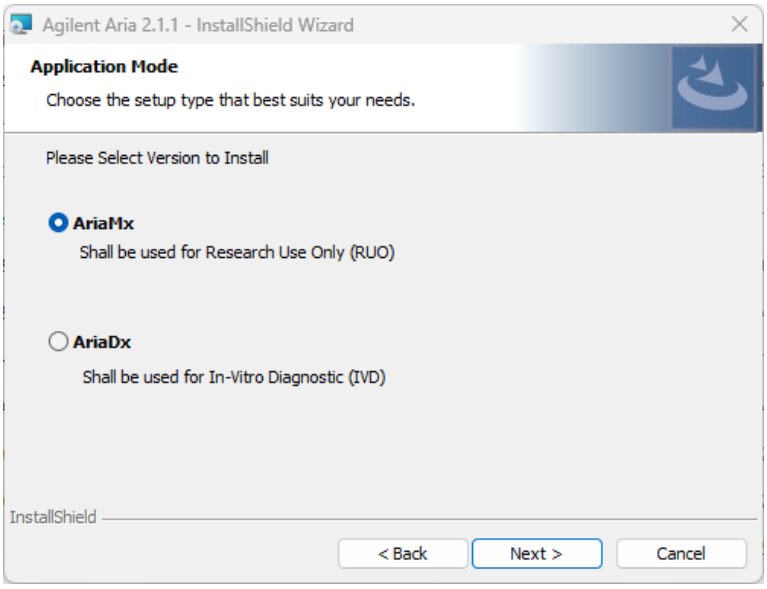

Figure 35 Agilent Aria installation wizard – Application Mode window

4 In the Application Mode window, select AriaMx, then click **Next**.

The Setup Type window opens.

NOTE The AriaMx mode of the software is only compatible with the AriaMx instrument. The AriaDx mode of the software is only compatible with the AriaDx instrument.

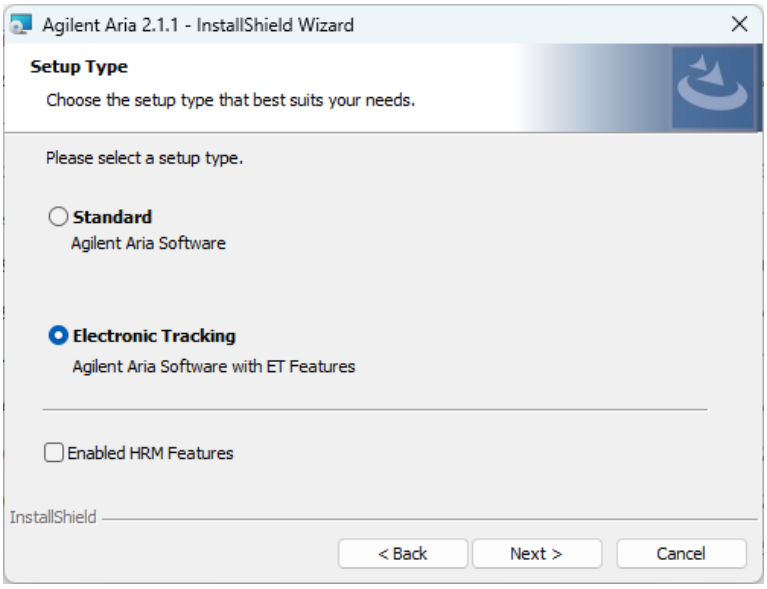

Figure 36 Agilent Aria installation wizard – Setup Type window

5 In the Setup Type window, select Electronic Tracking.

6 Make a selection for the software's HRM features. The HRM features allow full access to the graphical displays for experiments that use high resolution melt (HRM) analysis. Enabling the HRM features requires a separate license that can be purchased from Agilent.

- If you have purchased an HRM license and want to enable the HRM features in the Aria software, mark the check box labeled Enabled HRM Features.
- If you do not want to enable the HRM features in the Aria software, do not mark the check box labeled Enabled HRM Features.

7 Click **Next**.

The Software Activation window opens.

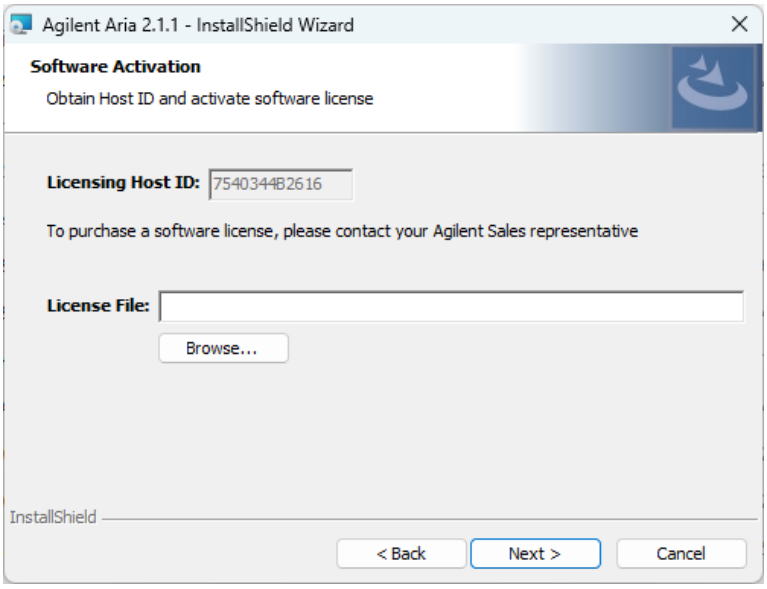

Figure 37 Agilent Aria installation wizard – Software Activation window

8 The Software Activation window displays the Licensing Host ID. Follow the instructions provided on your Software Entitlement Certificate to use this Licensing Host ID to redeem your software license and save the file to your PC. Then, in the Software Activation window, click **Browse** to open a dialog box where you can browse to the folder containing the license file. Select the file and click **Open**.

The dialog box closes and you are returned to the Software Activation window.

9 Click **Next**.

The Database Server window opens.

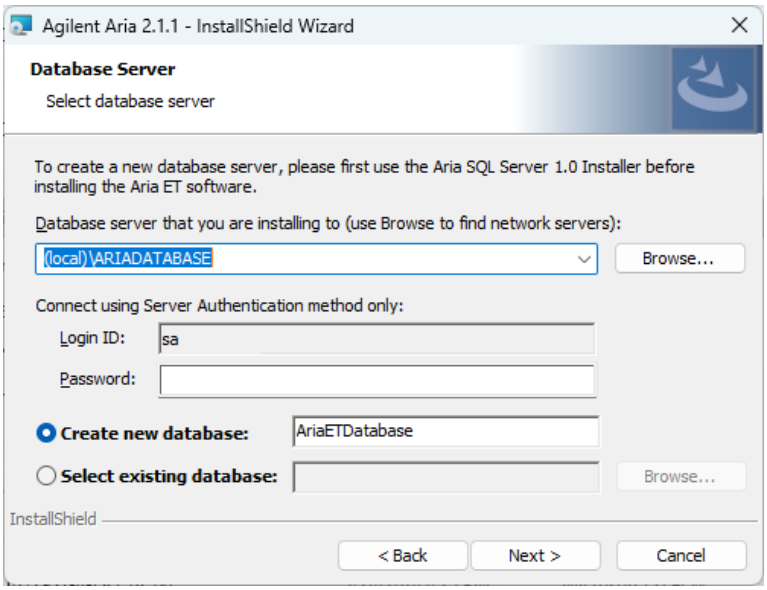

Figure 38 Agilent Aria installation wizard – Database Server window

10 In the drop-down list at the top of the Database Server window, select the database server instance that you set up while installing SQL Server (see **step 11** on page 43).

11 In the Password field, type the password for the database server instance that you entered while installing SQL Server (see **step 12** on page 43).

12 Select a database to use as the primary database when you log in to the Aria ET software.

- To create a new database, select **Create new database**. Type a name for the database into the adjacent field or use the default database name.
- To select an existing database, select **Select existing database**. Click **Browse**, and in the dialog box that opens, select the database that you want to use and click **OK**. The dialog box closes.

After you make your selection, click **Next** in the Database Server window.

The Destination Folder window opens.

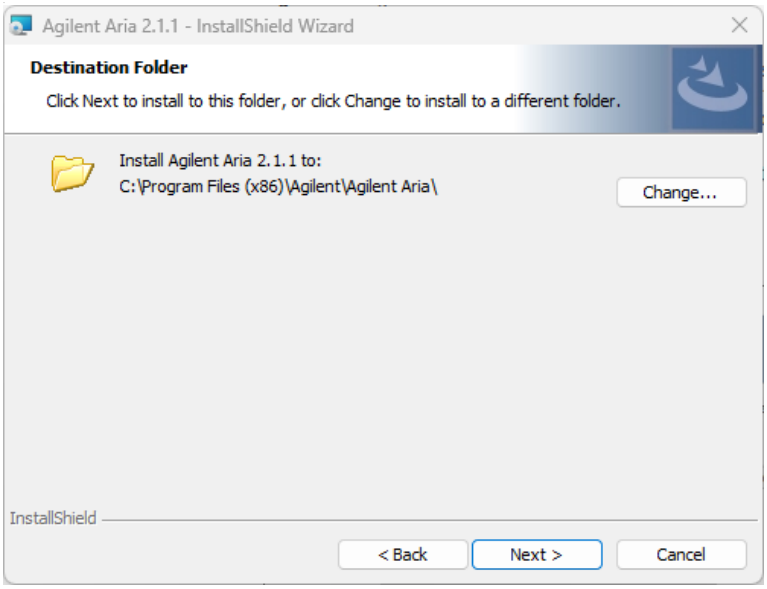

Figure 39 Agilent Aria installation wizard – Destination Folder window

13 Designate a folder for the software files. The default folder is C:\Program Files (x86)\Agilent\Agilent Aria.

- If you want to install the software to the default folder, click **Next** to continue.
- If you want to designate a different folder, click **Change** in the Destination Folder window. In the dialog box that opens, browse to the desired folder, select the folder, and click **Open**. Then, in the Destination Folder window, click **Next** to continue.

The Ready to Install window opens.

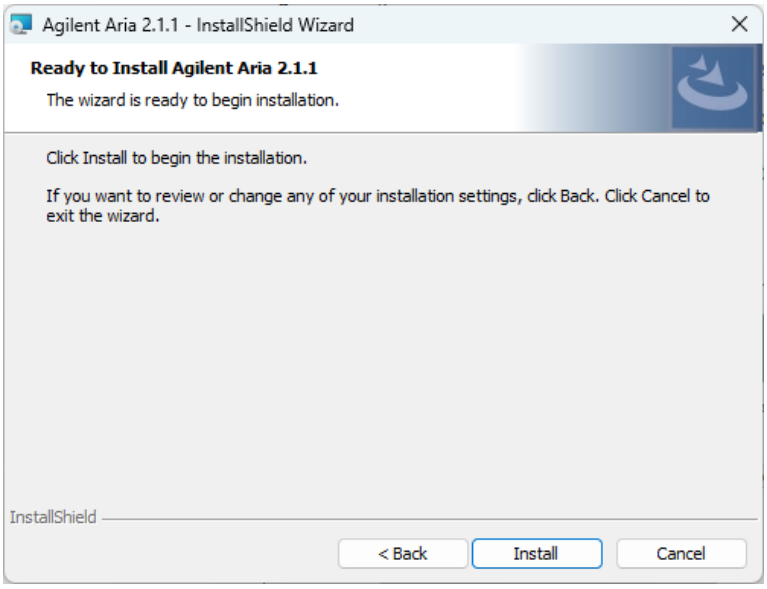

Figure 40 Agilent Aria installation wizard – Ready to Install window

14 Click **Install**.

The wizard installs the Aria software to the folder designated in **step 13**. When installation is complete, the InstallShield Wizard Completed window opens.

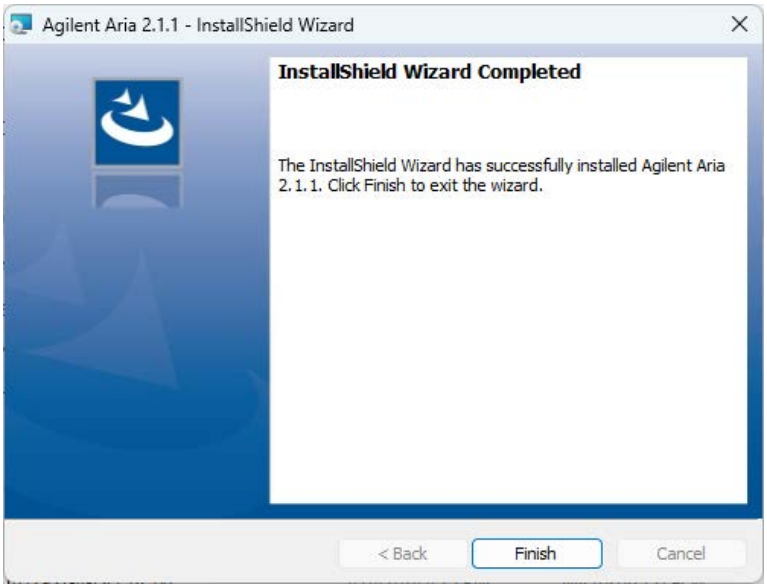

Figure 41 Agilent Aria installation wizard – InstallShield Wizard Completed window

15 Click **Finish** to close the wizard.

Configure and start Microsoft Distributed Transaction Coordinator (MSDTC) service

In order to archive and restore experiments to and from a database in the Aria ET software, your PC must be running MSDTC service.

Start MSDTC service

To start MSDTC service:

1. Open the Control Panel on your PC. Make sure you are viewing the Control Panel by category.
2. Click **System and Security**, then click **Administrative Tools**.
   The Administrative Tools folder opens in Windows Explorer.
3. Double-click **Services**.
   The Services window opens.
4. In the Name column of the Services window, double-click **Distributed Transaction Coordinator**.
   The Distributed Transaction Coordinator Properties dialog box opens.
5. Click the Log On tab of the Distributed Transaction Coordinator Properties dialog box. Make sure that **This account** is selected and that the adjacent field reads "Network Service."

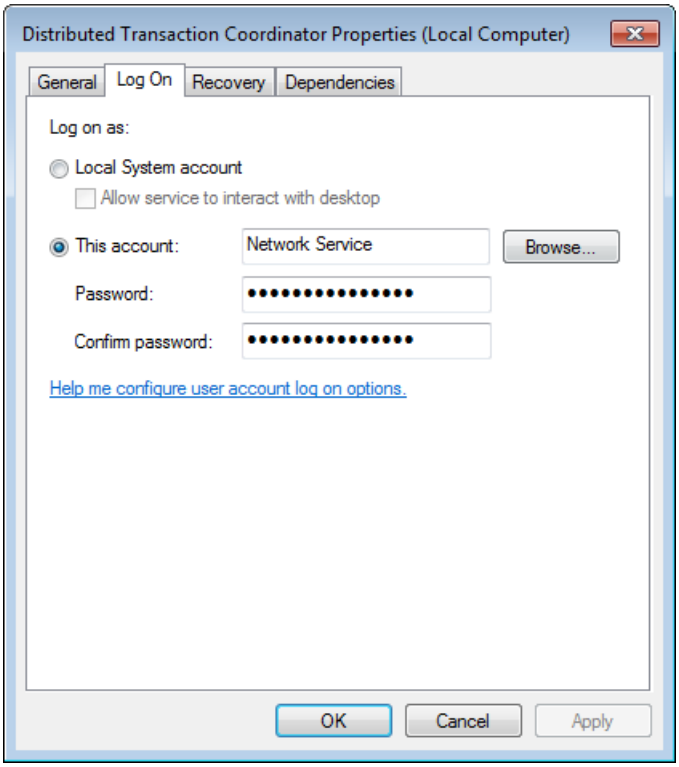

Figure 42 Distributed Transaction Coordinator Properties dialog box – Log On tab

6. On the General tab of the Distributed Transaction Coordinator Properties dialog box, set the **Startup type** to **Automatic**, then click **Start**.

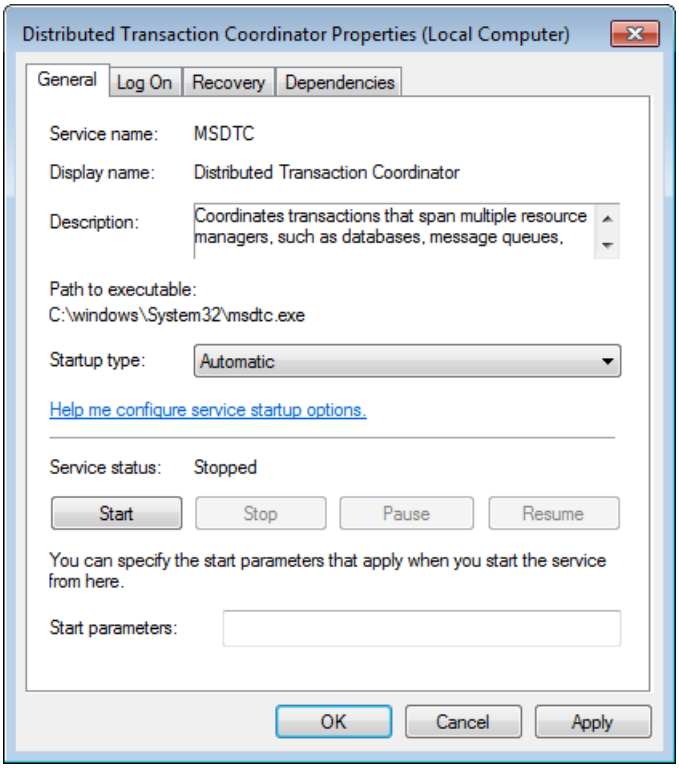

Figure 43 Distributed Transaction Coordinator Properties dialog box – General tab

7 Click **OK** to close the Distributed Transaction Coordinator Properties dialog box.

Configure Network Distributed Transaction Coordinator (DTC) access

1 Open the Windows Start menu and click **Run**.
The Run dialog box opens.

2 In the Open field, type **dcomcnfg.exe** and click **OK**.
The Component Services window opens.

3 In panel on the right side of the Component Services window, expand **Component Services > Computers > My Computer > Distributed Transaction Coordinator**.

4 Right-click on **Local DTC**. In the pop-up menu click **Properties**.
The Local DTC Properties dialog box opens.

5 Click the Security tab. Under **Security Settings** mark **Network DTC Access**.

6 Under **Transaction Manager Communication** mark **Allow Inbound** and **Allow Outbound**, and select **No Authentication Required**.

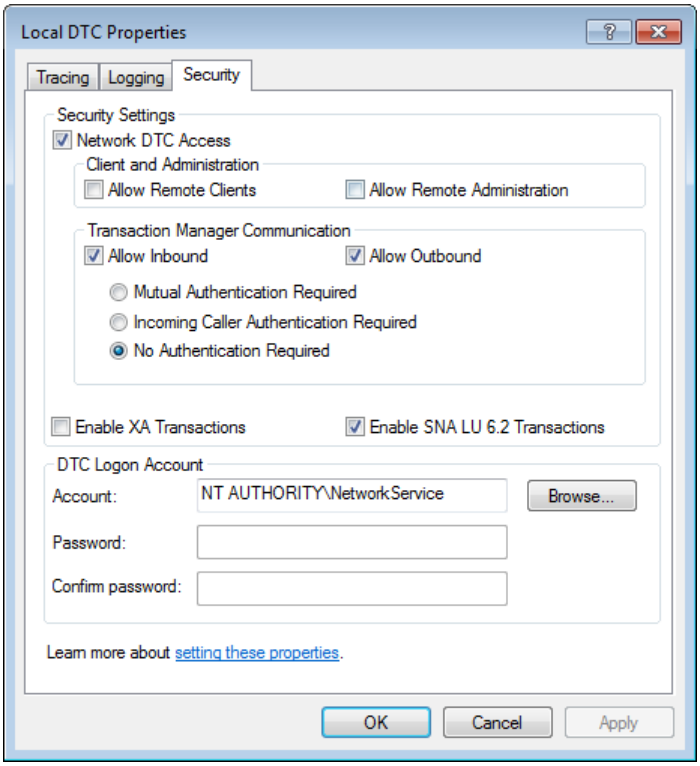

Figure 44 Local DTC Properties dialog box – Security tab

7 Click **OK**.

The Local DTC Properties dialog box closes and the MSDTC service starts or restarts.

8 Close the Component Services window.

Launch the Aria ET software

After installation is complete, the software is ready to launch.

To launch the Aria software:

1 From the Start menu, click **All Programs > Agilent > Agilent Aria > Agilent Aria X.X** (where X.X is the software version).

The Login dialog box opens, prompting you to log in to the primary database that you set up during installation the Aria ET software (see **step 12** on page 49).

2 Log in using the default administrator account.

a In the Username field, type **admin**.

b In the Password field, type **Password**.

c Click **Login** or press **Enter**.

The Change Password dialog box opens.

3 Select a new password for the account.

a In the Old Password field, type **Password**.

b In the New Password field, type a new password of your choosing. The password must be 6–15 characters in length and include at least one number.

c Retype the new password into the Confirm Password field.

d Click **OK**.

The dialog box closes. The software opens to the Getting Started screen.

NOTE

During installation, a set of sample experiments (**.amxd*) and sample templates (**.amxt*) were saved to the following folders.

C:\Users\Public\Public Documents\Agilent Aria\Sample Experiments
C:\Users\Public\Public Documents\Agilent Aria\Experiment Templates

You can now open these files in the Aria software.

Installing Microsoft .NET Framework 4.8

In order to install the Aria software, you must have Microsoft .NET Framework 4.8 or greater installed on your PC. If you attempted to install the Aria software and received an error message stating that Microsoft .NET Framework 4.8 is needed, follow the instructions in this section to install this software.

1. Make sure your PC is connected to the internet. Go to the AriaMx Software Download website: **www.agilent.com/en/product/real-time-pcr-(qpcr)/real-time-pcr-(qpcr)-instruments/ariamx-software-download**.
2. Under Aria PC Software requirements, click **Microsoft .NET Framework 4.8 Installer**.
3. Save the Installer to your computer. The Installer is named *NDP48-x86-x64-AllOS-ENU.exe*.
4. Double-click the *NDP48-x86-x64-AllOS-ENU.exe* file.

   The Microsoft .NET Framework 4.8 Setup window opens.
5. Follow the prompts in the Microsoft .NET Framework installer to complete the installation.
6. When the installation of Microsoft .NET FrameWork 4.8 is complete, install the Aria software. See "Installing the Standard Aria Software" on page 33.

4 Running Experiments

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This chapter contains instructions on preparing and running experiments and managing experiment files on the instrument.

Verifying performance of the AriaMx Real-Time PCR System

Prior to running your first assay on the AriaMx Real-Time PCR System, Agilent recommends running a system verification to verify the performance of the instrument and of all dyes you intend to use in your assays.

To perform this system verification, run an experiment using a 96-well PCR plate (or set of PCR tubes) that contains positive control reactions in one column and negative control reactions in another column, across all rows of the plate that are in use in your assays. Use the same reagents and dyes that will be used in your assays.

Agilent recommends performing this verification prior running your first assay and following any intervention on the AriaMx instrument (such as, preventative maintenance operations, motor calibration, and installation, replacement, or repositioning of an optical module).

Preparing and Loading PCR Samples

Prepare samples

When preparing the PCR reactions, follow the guidelines below for optimal results.

- Use only temperature-stable PCR tubes and plates. See "Recommended plasticware" on page 11 for a list of recommended tubes and plates.
- Place caps on tubes before loading samples into the thermal block.
- Spin samples briefly in a centrifuge immediately before loading them into the thermal block.

Load samples

The instrument can be loaded with individual PCR tubes or strip tubes or one 96-well PCR plate.

1. Open the instrument door that covers the thermal block assembly by lifting up on the handle on the top of the instrument. Lift the door all the way up and back.
2. Lift the heated lid by pulling forward on the handle of the lid and then lifting the lid up and away from the thermal block.
3. Put your plate or tubes on the block and check that they are correctly positioned.
4. Close the heated lid until so that it latches into place.
5. Close the instrument door so that it latches into place.

WARNING **Danger of Burns: The thermal block, sample tubes and plates may reach temperatures as high as 100°C. Keep hands away until temperature is 30°C or less.**

Setting Up and Running Experiments

You can set up the plate and thermal profile for an experiment on either the instrument touchscreen software or on the Aria software on your PC. The instructions below provide the basic steps required to set up an experiment and start running the experiment. For more detailed information about setting up and running experiments, see the help system in the AriaMx PC software.

Use the touchscreen to set up and run an experiment

1. (Optional) Log in the instrument. See "Step 3. Log in to your personal user account" on page 29.

   Logging in to your personal account allows you to save the experiment to your user folder. If you are logged in as *Guest*, you must save the experiment to the Guest folder.
2. On the Home screen, press **New Experiment**.

   The Experiment Types screen opens.
3. Create the experiment using one of the following approaches.
   - Press the desired experiment type. The Plate Setup screen opens.
   - Press **Open Template**. The Template screen opens. Press a template file to select it then press **Open**. The Plate Setup screen opens.
4. On the Plate Setup screen, set up the wells of the plate. Press the help icon for help with working on the Plate Setup screen.
5. Press the Thermal Profile tab.

   The Thermal Profile screen opens.
6. Set up the thermal profile for the experiment. Press the help icon for help with working on the Thermal Profile screen.
7. Load the samples onto the thermal block (see "Load samples" on page 58), and press **Run Experiment** on the Thermal Profile screen.

   A message box opens asking you to save the experiment. Click **OK** to open the Save Experiment screen.
8. Select a folder for the experiment file and press **Save**.

   The Raw Data Plots screen opens, allowing you to monitor the progress of the run.

Use the PC software to set up and run an experiment

1. On the Getting Started screen, create the experiment using one of the following approaches.
   - Click **Experiment Types**. The screen displays the experiment types. Click the desired experiment type to select it. Type a name for the experiment and click **Create**. The Plate Setup screen opens.
   - Click **My Templates**. The screen displays the templates in the default template folder. Click the desired template to select it. Type a name for the experiment and click **Create**. The Plate Setup screen opens.

- Click **From LIMS file**. The screen displays a wizard for importing a LIMS data file. Use the wizard to import a saved LIMS data file and describe the new experiment. Upon completing the wizard, the Plate Setup screen opens.

2 On the Plate Setup screen, set up the wells of the plate. See the software help system for help with setting up the plate.

3 Click **Thermal Profile** in the Experiment Area on the left side of the screen.

The Thermal Profile screen opens.

4 Set up the thermal profile for the experiment. See the software help system for help with setting up the thermal profile.

5 Click **Run**.

The Instrument Explorer dialog box opens.

6 In the dialog box, locate the instrument and click **Send Config**.

- If you have not already logged in to the selected instrument, you will be prompted to log in before continuing.
- If you have not already saved the experiment you will be prompted to save it before continuing.

7 Load your samples onto the thermal block (see "Load samples" on page 58).

8 At the bottom of the instrument touchscreen, press the icon shown below.

In the pop-up menu that opens, press **Open Primed Experiment**.

The experiment opens on the touchscreen.

9 On the Thermal Profile screen of the touchscreen, press **Run Experiment**.

The Raw Data Plots screen opens, allowing you to monitor the progress of the run.

Managing Saved Experiments

Each user account, including the Guest account, has its own user folder on the AriaMx instrument. Users can save and retrieve experiment files to and from the folders to which they have access. (All users have access to the Guest folder and the folder for their account. Administrator accounts have access to all folders on the instrument. Users logged in as *Guest* can only access the Guest folder and the HRM Calibration folder.)

Locate saved experiment files

1. If necessary, log in the instrument. See "Step 3. Log in to your personal user account" on page 29.

   Logging in to your personal account allows you to access experiment files in your user folder. If you are logged in as *Guest*, you can only access experiment files in the Guest folder and the HRM Calibration folder (which only contains HRM calibration experiments).

2. On the Home screen of the touchscreen, press **Saved Experiment**.

   The Experiment Explorer screen opens. The left side of the screen lists the folders to which you have access.

3. Press directly on a folder to select it.

   The right side of the screen lists the experiment files and any subfolders in the selected folder. Experiment files have the file extension *amxd*.

4. To open a subfolder, double-press the subfolder on the right side of the screen.

   The subfolder expands to display the experiment files and subfolders contained within.

Create a subfolder

1. On the Experiment Explorer screen, locate the folder in which you want to create a subfolder. Press the folder to select it.

   See **"Locate saved experiment files"**, above, for instructions on opening and navigating the Experiment Explorer screen.

2. Press **New Folder**.

   The virtual keyboard appears.

3. In the New Folder Name field, type a name for the subfolder. Press **Create Folder**.

   The new subfolder appears on the Saved Experiment screen.

Copy and paste experiments

1. On the Experiment Explorer screen, locate the experiment that you want to copy. Press the experiment to select it.

   See "Locate saved experiment files" on page 61 for instructions on opening and navigating the Saved Experiment screen.
2. Press **Copy**.
3. Browse to the folder to which you want to paste the experiment file. Press the folder to select it.
4. Press **Paste**.

   The experiment file is pasted to the selected folder.

Transfer experiments to a USB drive

1. Insert a FAT format USB drive into the USB port on the front of the instrument.
2. On the Experiment Explorer screen, locate the experiment that you want to copy. Press the experiment to select it.

   See "Locate saved experiment files" on page 61 for instructions on opening and navigating the Saved Experiment screen.
3. Press **Copy**.
4. On the left side of the Experiment Explorer screen, press the folder for the USB drive (called USBDisk).
5. Press **Paste**.

   A copy of the experiment file is saved to the USB drive.

NOTE You can also transfer experiments from the instrument to the Aria PC software by connecting the instrument directly to the PC or a network. See page 22 for instructions setting up PC or network connections. See the help system for the Aria PC software for instructions on retrieving experiments from a connected instrument.

5 Calibrating the AriaMx System

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Calibrate HRM data 68

This chapter contains instructions for calibration procedures that can be performed on the AriaMx Real-Time PCR System.

Performing Motor Calibration

Motor calibration is performed prior to shipping a new instrument. You do not need to calibrate it again unless the instrument prompts you to do so or you asked to do so by Agilent Technical Support.

Calibrate the motor

A motor calibration (MC) is a procedure that designates the location of each well that is scanned by the optical modules for each individual slot. Instruments are provided with the motor calibration step completed, and additional motor calibration runs are not generally required after receipt of the instrument. If, however, you see a notification on the instrument touchscreen alerting you that motor calibration is required (**Figure 45**), press **OK**, then follow the on-screen prompts.

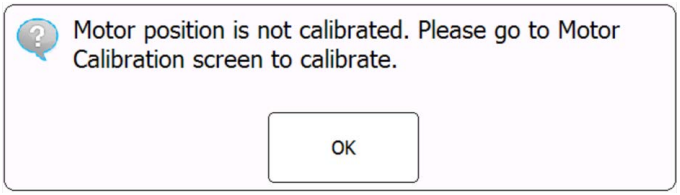

Figure 45 Notification when motor position is not calibrated

After calibrating the motor, perform a system verification prior to running an assay. See "Verifying performance of the AriaMx Real-Time PCR System" on page 57.

If the motor calibration procedure fails, a notification opens (**Figure 46**). Click **OK** to repeat the motor calibration. If the motor calibration fails a second time, a notification opens (**Figure 47**) instructing you to contact Agilent **Technical Support**. *The instrument will not allow you to run experiments until the motor is successfully calibrated.*

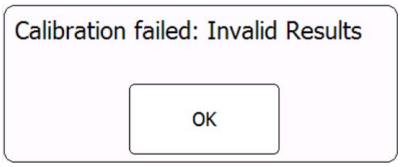

Figure 46 Notification when motor calibration fails

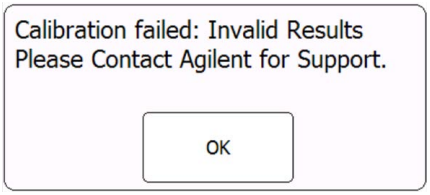

Figure 47 Notification when motor calibration fails a second time

NOTE Adding and removing optical modules does not cause the instrument to require a motor calibration.

Check the motor calibration date

You can check the date and time of the most recent motor calibration run.

1. On the Home screen, press **Settings**.
2. On the Settings screen, press **System Settings**.
3. On the System Settings screen, press **Motor Calibration**.

   This screen displays the date and time that motor calibration was run for the instrument (see **Figure 48**). If the date and time are not listed, this is an indication that the calibration was performed on an earlier version of the firmware (i.e., prior to version 2.1).

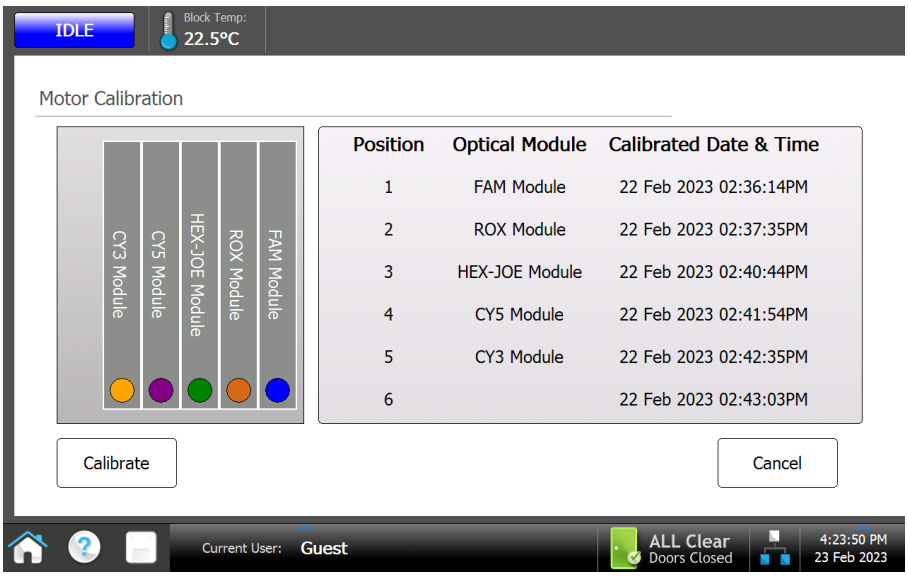

Figure 48 Motor Calibration screen

Performing Background Calibration

Background calibration determines the level of background noise associated with each optical module and compensates for that background. Anytime you install new optical modules, a message box opens on the touchscreen prompting you to calibrate the background for the optical modules.

Calibrate the background

When replacing the optical module installed in any slot with a different module, the touchscreen will prompt you to run the Background Calibration for the newly-installed module.

1 When a message box opens on the touchscreen prompting you to run background calibration, press **Calibrate**.

The Background Calibration screen opens.

2 Prepare the PCR plate for the calibration run.

a Add 20 µl of water or TE buffer (10 mM Tris/1 mM EDTA) into all 96 wells of a PCR plate. Cap the wells or seal with film.

b Spin the plate briefly to collect the fluid at the bottom of the wells.

c Insert the plate in the thermal block, close the hot top, and press **Calibrate** on the touchscreen.

When the instrument has completed the calibration, the Background Calibration screen will be updated to show the revised calibration status for each optical module.

3 Press **Cancel** to return to the System Settings screen.

Check the background calibration status

You can check the date and time of the most recent background calibration run for each optical module that is currently installed.

1 On the Home screen, press **Settings**.

2 On the Settings screen, press **System Settings**.

3 On the System Settings screen, press **Background Calibration**.

This screen displays the background calibration status and other properties of the optical module installed in each slot of the instrument (see **Figure 49**). To view the properties of a specific installed optical module, press the bar corresponding to that module slot on the left side of the screen.

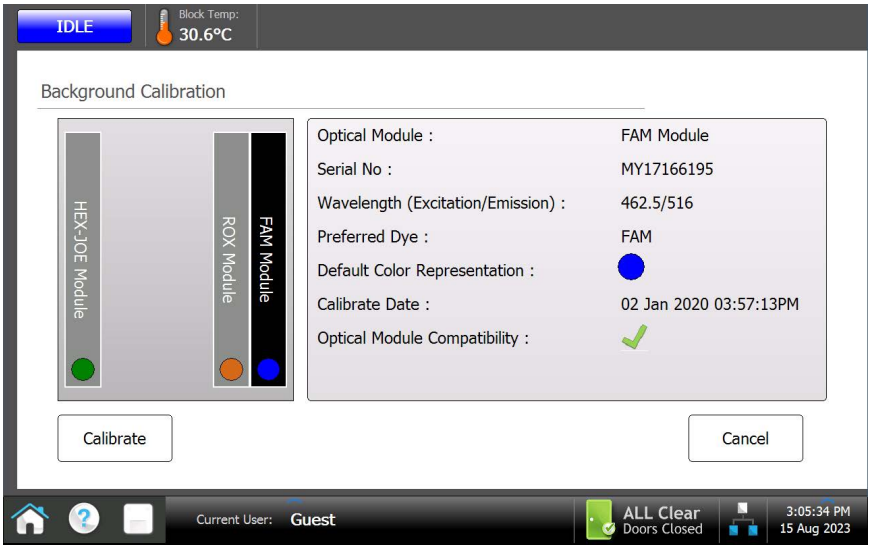

Figure 49 Background Calibration screen

Performing Other Calibration Procedures

The other calibration procedures available on the AriaMx system include calibrating the touchscreen and calibrating high resolution melt data analysis.

Calibrate the touchscreen

You can calibrate the touchscreen response functions in order to optimize sensitivity.

1 On the Home screen, press **Settings**.

2 On the Settings screen, press **Calibrate Touch**.

The next screen instructs you to touch a marker (+). Follow the prompts provided on the screen.

Calibrate HRM data

For experiments that include a high resolution melt (HRM) segment, you must associate the experiment with an HRM calibration plate (HCP) that was run on the same instrument. See the help system for the Aria software for instructions on running an HCP.

6 Troubleshooting, Maintenance, and Updates

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Service the instrument 71
Clean the instrument 71
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Updating the Instrument Software 74
Cybersecurity Guidance 75

This chapter contains instructions for maintaining the instrument and uploading software updates.

Troubleshooting Instrument Error Messages

When the instrument detects issues with the hardware, firmware, or optical modules, it notifies you with an error message. Error messages are also prompted when the instrument encounters an issue while running the scanning application feature or while performing diagnostic tests.

View error messages

When the AriaMx instrument encounters an error, it notifies you by displaying an error icon at the bottom of the touchscreen.

1. Press the error icon at the bottom of the touchscreen.
2. In the pop-up menu that opens, press **Count X**, where X is the number of error messages to be read.

   A table opens displaying the following information.

   - Type - The type of message (Error or Warning). Warning messages are used for errors that do not prevent you from running experiments on the instrument.
   - ID - The error code ID number.
   - Description - A description of the error with instructions on how to resolve it.
3. Press **OK** to close the table.

Open the diagnostic report

Some error messages may instruct you to refer to the diagnostics report for further details about the cause of an error.

1. Log in using an Administrator account.

   See "Step 1. Log in to the instrument using an Administrator account" on page 28.
2. On the Home screen, press **Settings**.

   The Settings screen opens.
3. Press **Instrument Diagnostic**.

   The Diagnostic Test screen opens.
4. Press **View Result**.

   The Diagnostic Report screen opens. The table lists each category of diagnostic test included on the report.
5. Double-press a category to expand its contents.

   The table displays the tests within that category. The Results column indicates if the test passed or failed. The Run Date column lists the date and time of the test.

Maintaining the Instrument

The AriaMx instrument is designed to require a minimum amount of maintenance by the user.

Service the instrument

As preventative maintenance, Agilent recommends having your AriaMx instrument serviced by an Agilent service engineer every 12 months. Contact Agilent technical support for information on instrument service. See "Agilent Technical Support" on page 14 for contact information.

Following any instrument service, perform a system verification prior to running an assay. See "Verifying performance of the AriaMx Real-Time PCR System" on page 57.

Clean the instrument

To clean the exterior of the AriaMx instrument:

1. Turn off and disconnect the instrument from the power supply.
2. Using laboratory wipes moistened with 70% isopropyl alcohol, clean the exterior surfaces of the instrument listed below. *Do not let liquid enter the instrument.*
   - All surfaces of the door including the depression at the top that is used to open the door
   - The surface of the touchscreen
   - Both sides of the instrument
   - The power button and adjacent area
   - The front panels of the instrument
3. Allow isopropyl alcohol to evaporate before reconnecting the instrument to the power supply.

Clean the optical modules

To clean an optical module:

1. Turn off and disconnect the instrument from the power supply.
2. Remove the optical module from its slot in the optical module housing.
   a. Slowly slide the optical module housing carrier to the center of the opening of the instrument door.
   b. Open the lid on the optical module housing carrier.
   c. Lift the hinged tab on the top of the optical module (see **Figure 50**), then use the tab to lift the optical module out of its slot.

Figure 50 Lifting the hinged tab on an optical module

3 Using an aerosol can of compressed air, clean the bottom surface of the optical module (the surface opposite of the label). Hold the can 3–4 inches away from the surface as you press the trigger.

4 (Optional) Wipe the bottom surface with a lens cloth or lens tissue moistened with reagent-grade isopropyl alcohol.

5 Re-install the optical module into the housing. Lower the hinged tab until it snaps into place.

6 Close the lid on the housing carrier.

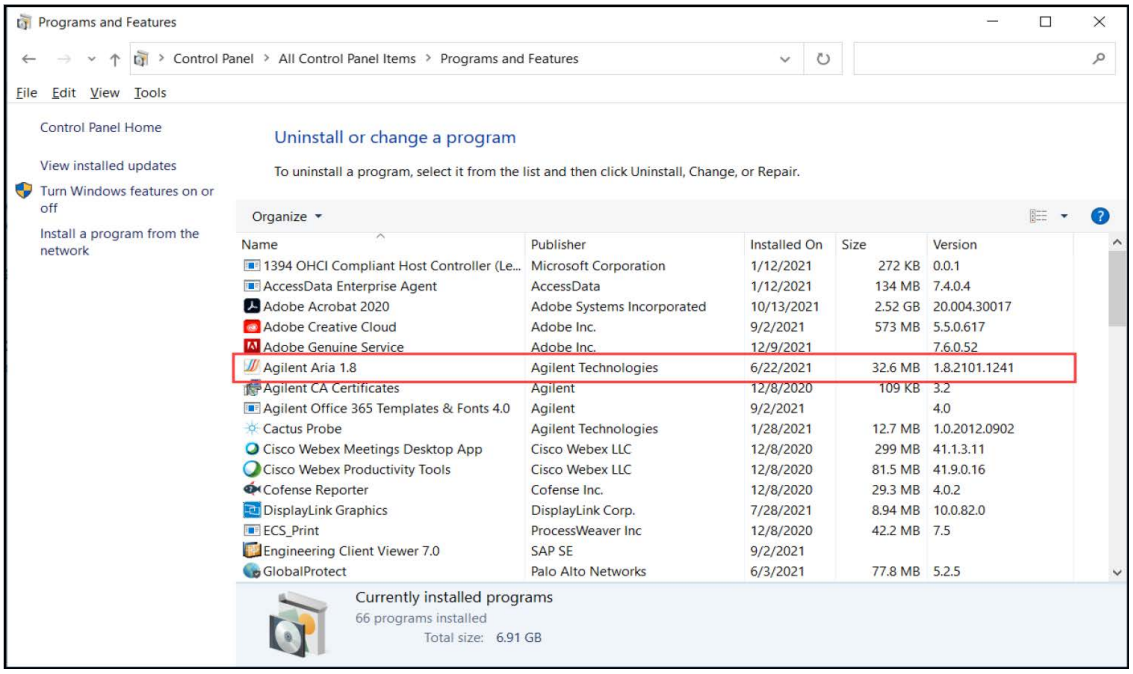
The instrument initiates a background calibration. See "Performing Background Calibration" on page 66 for more information.

Maintaining the PC and Instrument Software Programs

View the current version of the PC software

Agilent recommends running the latest available version of the Aria PC software. Additionally, when upgrading the Aria PC software, Agilent recommends also upgrading the instrument software to ensure you can continue to connect to the instrument from your PC. Follow the instructions below to determine which version of the Aria software is installed on your PC.

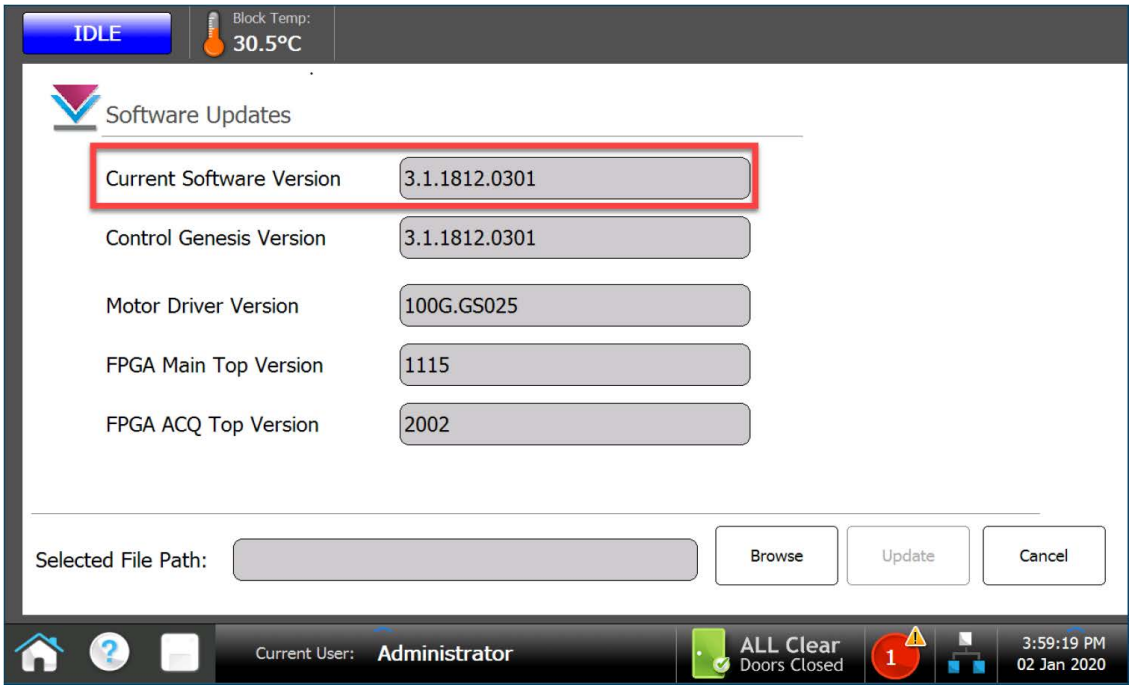
1. In the search box next to **Start** on the taskbar, type **control panel**.
2. Select **Control Panel** from the list of results.
3. Select **Programs and Features**.
4. Find Aria Software Version from the list of programs.
   Example: Aria software version shown below is *Aria 1.8*.



View the current version of the instrument software

Agilent recommends running the latest available version of the instrument software (firmware). Follow the instructions below to determine which version of the firmware is installed on your AriaMx instrument.

1. From the Home screen, press **Settings** and then press **Software Updates**.
   Instrument firmware version is labeled as **Current Software Version**.



Updating the Instrument Software

You will be notified by Agilent when a new version of the instrument software is available. This notification includes a web address where you can download the software files. Save these files to an external USB drive and then upload them to your instrument using the instructions below.

1. Login to one of the Administrator user accounts. See "Step 1. Log in to the instrument using an Administrator account" on page 28.
2. From the Home screen, press **Settings** and then press **Software Update**.
3. Insert the USB drive (FAT format) into the USB port on the front of the instrument.
4. Press **Browse** to open a browser that allows you to navigate to the folder containing the software files. Select the appropriate folder and press **OK** to return to the Software Update screen.
5. Press **Update**.

   The instrument begins the update. When the update is complete, the instrument automatically reboots.
6. When the reboot is complete, you may return to the Software Update screen to confirm the new version of the software is running.

Cybersecurity Guidance

The Electronic Tracking (ET) option for the Aria software provides the ability for user account management including creating, changing, safeguarding, and terminating accounts. The HealthCare Organization shall create corresponding internal procedures to address the following items:

1. All the network equipment, computer hardware, software, databases etc. must be protected by user authentication (ID and password).
2. System should be accessible though domain as well as local user.
3. System should use Windows and/or Hospital Information (IT) infrastructure password policy.
4. System should support role management access. Access to files and drives should be given for appropriate role.
5. System should allow appropriate users to
   - Create new users
   - Add/remove privileges to user
   - Terminate/disable user
   - Create groups with defined privileges
   - Add/remove users to/from group.
6. System should be locked after predefined time of inactivity.
7. All systems should have anti-virus and anti-spyware software installed.
8. The anti-virus and anti-spyware software should be updated regularly.
9. Important data should be secured using Cryptography or encryption- decryption equipment.
10. Data transmitted to and from devices must be encrypted.
11. Unauthorized devices trying to connect to the network must be blocked.
12. Unused ports should be blocked to minimize risk of tampering.
13. Firewall should be set to prevent unauthorized access from internet/intranet.
14. The use of mobile devices must follow mobile device management policy.
15. Documented procedures for addressing security breaches must be available.
16. Authorized user accounts must be regularly audited.
17. Database backup must be performed on a regular basis and must be performed before installing any software upgrades.
18. Employees must be educated on privacy and security policies through a strict training process.
19. The number of remote computers, portable devices and ports used to connect to IVD systems should be kept to a minimum.
20. Software must be kept up-to-date and any available patches promptly installed.
21. A documented security plan for disposal of unwanted data must be available.
22. Policies and processes for data security must be regularly reviewed and updated.

www.agilent.com

In This Book

This document describes how to program and use the Agilent AriaMx Real-Time PCR System.

Manufacturer

Agilent Technologies Singapore (International) Pte. Ltd.
No. 1 Yishun Ave 7, Singapore 768923
Manufactured at:
Agilent Technologies LDA Malaysia Sdn. Bhd.
Bayan Lepas Free Industrial Zone 11900 Penang, Malaysia
www.agilent.com

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