User Manual

for Accellix Software Version 3.8.3

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Table of Contents

About the Accellix Platform

The Accellix Platform is a benchtop flow cytometer utilizing a single-use cartridge and customizable analysis software. It is simple to use, requires no extensive training, and does not involve complex operational processes. Accellix greatly expands access to flow cytometry capabilities by replacing previously complex workflows with a user-friendly automated instrument and easy-to-use cartridges. Obtaining flow cytometric results normally requires many steps such as assay preparation by a highly trained individual, sending samples out to a centralized lab, and analysis of the data by a professional Flow cytometry analyst. However, when working with the Accellix Platform, these steps are simplified, or even eliminated.

Using the Accellix Platform, flow cytometric results can be obtained rapidly, even at the site where a specimen is produced. For biotech industry researchers and product developers alike, Accellix provides a flexible platform to streamline the development of customized assays. In addition, Accellix can be utilized in quality assurance and quality control (QA/QC) processes in the immunotherapy field, reducing time and costs in the processing of cellular samples while increasing reproducibility. In all these cases, utilization of the Accellix platform eliminates transport time, wait time at the processing lab, reduces training time to one hour due to a simplified workflow, and decreases variability by automating most of the sample preparation. All these time-saving steps equate to sample preparation through complete analysis in just 30 minutes.

In other applications, using Accellix can increase efficiency and reduce costs. As the Accellix instrument is more compact than most existing flow cytometry systems, it is uniquely suited for point-of-need (PON) flow cytometric applications, as well as for use as an in-line process analytical technology (PAT) in biologics manufacturing processes.

In summary, the Accellix Platform automates and simplifies sample preparation, provides a user-friendly interface, and yields reliable results, all while using single-use cartridges. Accellix also provides automated data analysis, reducing the need for access to a trained professional and increasing the consistency of this process.

Intended Purpose

Note: This document provides instructions regarding the Accellix Instrument. For instructions regarding Accellix cartridges and associated assay reagents, refer to the Technical Data Sheet and Instructions for Use of the relevant assay. The Accellix Platform is intended to perform the flow cytometric measurement of analytes in biological samples, using cartridges designed specifically for use with the Accellix Instrument. The instrument is intended to be used with an Accellix Cartridge. In addition to supporting rapid assay development, Accellix can be utilized for applications requiring customized assays, such as cell engineering, as an automated quality control (QC) tool.

Two types of assays have been developed for the Accellix:

- **Off-the-shelf assays** - these include generic assays which are used throughout research & development of cell products. Among others, Accellix offers a T cell panel for monitoring T lymphocyte populations, a TBNK panel for general lymphocyte populations and a stem cell panel for monitoring hematopoietic stem cell populations.

- **Customized assays** - the Accellix Platform's flexibility enables migration of user-specific assays onto the instrument. During a joint development process, customized cartridges are developed based on the user's specific needs. For example, customized assays are developed to streamline the QC monitoring process for manufacturing and releasing cell therapy products.

Principles of Operation

The Accellix Platform is based on the general principles of flow cytometry, and combines fluidic, optical, and electronic systems to measure and analyze optical and fluorescence characteristics of cells or other particles of interest.

Accellix enables the automation of the following three steps in the flow cytometry process:

- Biochemical sample preparation—*i.e.,* the assay
- Flow cytometric data acquisition
- Reporting of the events detected in a format which readily permits further analytical data processing. Algorithm-based auto-analysis of cell populations or manual analysis options are available.

In rare instances, inaccurate results may occur due to incorrect usage of the instrument. The instrument should be used in strict accordance with this User Manual.

The Accellix platform is designed to enable an automated flow cytometry workflow. Instrument operators need only to perform a few simple operational steps which entail very limited training. Neither extensive laboratory experience nor specialized skills are required.

Mode of Operation

The following steps describe the mode of operation of the Accellix system:

1. User selects the cartridge which is suited for the desired assay.

2. User introduces assay specimen into the Accellix Cartridge (See Technical Data Sheet and Instructions for Use for cartridge-specific preparation instructions) and closes the plug or seal to create a closed system.

3. User taps the **Start** icon on the Accellix Instrument touch screen. The assay process begins.

4. User follows the step-by-step instructions on the instrument touchscreen.

5. User opens the Accellix Instrument door, inserts cartridge, and then closes the instrument door.

6. The instrument automatically reads the identifying data for the cartridge (cartridge type, lot number, serial number, etc.) from the QR code on the cartridge.

7. User is prompted to enter a sample ID and kit number (note that the kit number may not be configured for all devices). This information can be entered using the on-screen keypad on the touchscreen, an external keyboard connected via USB port, or by using a barcode scanner.

8.   The user is required to confirm that sample ID and cartridge type that have been recorded are correct before proceeding to run the assay.

9.   A progress indicator is displayed on the instrument screen, giving an indication as to the time remaining until the completion of the assay.

10.   The assay proceeds automatically, including the execution of the flow cytometric reading and analysis of the data acquired.

11.   At assay conclusion, messages on the instrument screen notify user that assay has been concluded.

12.   Depending on the specific assay which has been run and the instrument configuration, the analyzed data may be copied to a file location in the instrument memory or on an attached external drive. If relevant, a results screen is displayed, and a printout is automatically issued (See Technical Data Sheet for the outcome designed for a specific test type.).

13.   Following the assay, the single-use cartridge is removed from instrument by user and disposed in a receptacle for biohazard waste.

14.   After the instrument door has been closed, the instrument screen returns to the **Home** screen, and the next assay can be started.

Overview of Operating Elements

The Accellix Platform is composed of a benchtop flow cytometer instrument, a single-use cartridge, and customizable analysis software available separately.

The Accellix Instrument is operated using the touchscreen display, as shown below in Figure 1.
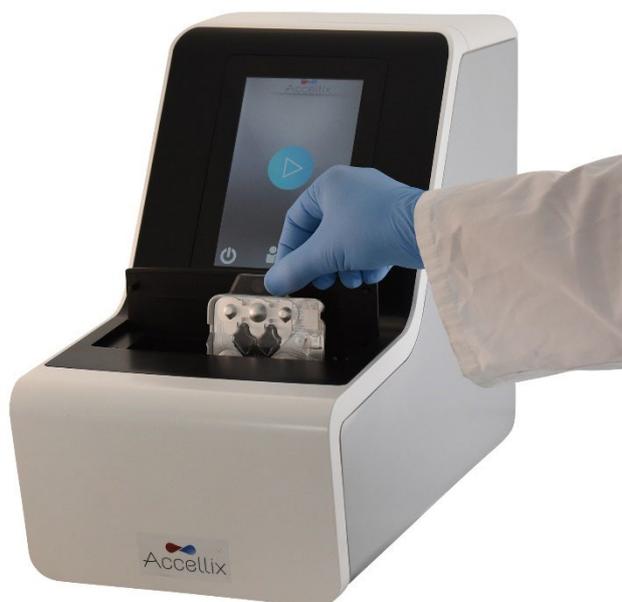

Figure 1: The Accellix Instrument

An image of the front (Figure 2) and an illustration of the back (Figure 3) of a single-use Accellix cartridge are displayed below. A description of how to use each Accellix cartridge type is provided in the assay's Technical Data Sheet.
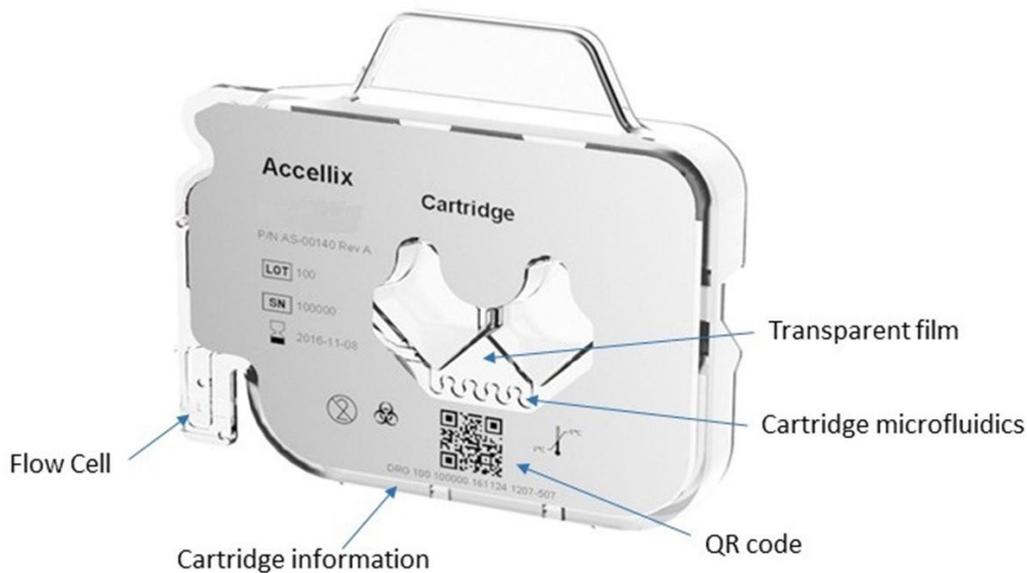

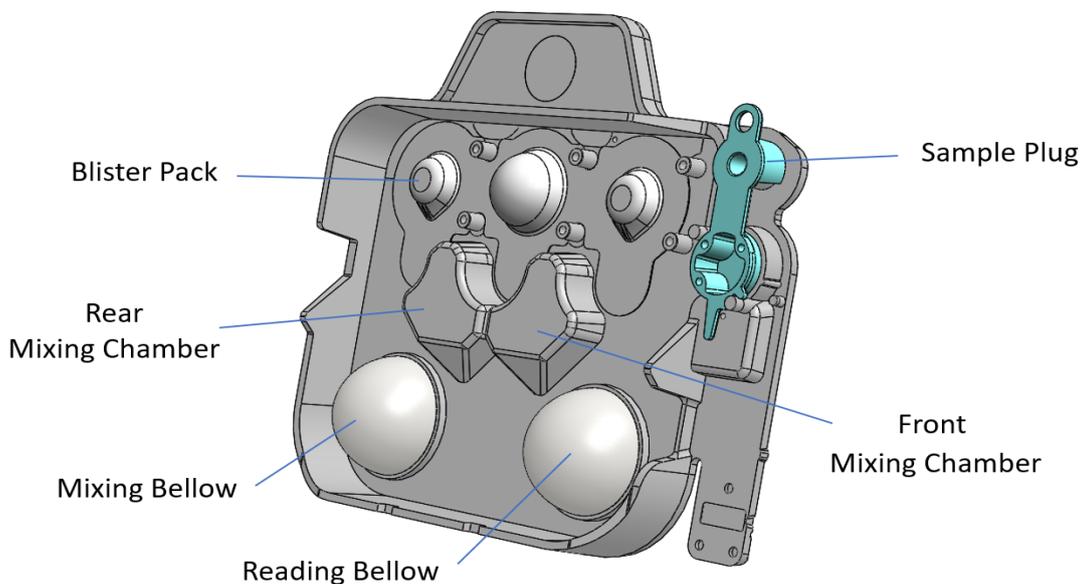*Figure 2: Image of an Accellix cartridge, as viewed from the front surface.*

Figure 3: Illustration of an Accellix cartridge, as viewed from the rear surface.

First Time Installation

Product Contents

PART #	DESCRIPTION	QTY.
AS-00150	Accellix Flow Cytometer	1
CS-00070	Biohazard Bag	1
CSE-00624	WiFi Antenna	1
CSE-00680	Power Supply Cable (interchangeable for multiple geographical regions)	1
CSE-00551	Ethernet Cable	1
CSE-00693	USB 3.0 32GB DOK for User Manual	1
CSF-00578	Vortex Foam Adapter	1

- Unpacking and installing the Accellix Instrument is a procedure which should be performed only by an Accellix Field Application Scientist.
- Check with Accellix support if the shipping case can be returned to the manufacturer or disposed of.

Installation of Computer Hardware

Computer hardware components can be connected to the Accellix instrument using the ports on the rear panel (Figure 4).

Certain components, e.g., power cable, Ethernet network cable, and/or printer-USB cable, will normally be connected by an Accellix Field Application Scientist at the time of initial instrument installation.

Certain assay types generate data files that are intended to be copied to a user-selected destination. Therefore, the user may wish to attach an external drive to the instrument to copy data files. In this case, the user should carefully connect the drive to the instrument at one of the four USB ports on the rear panel.
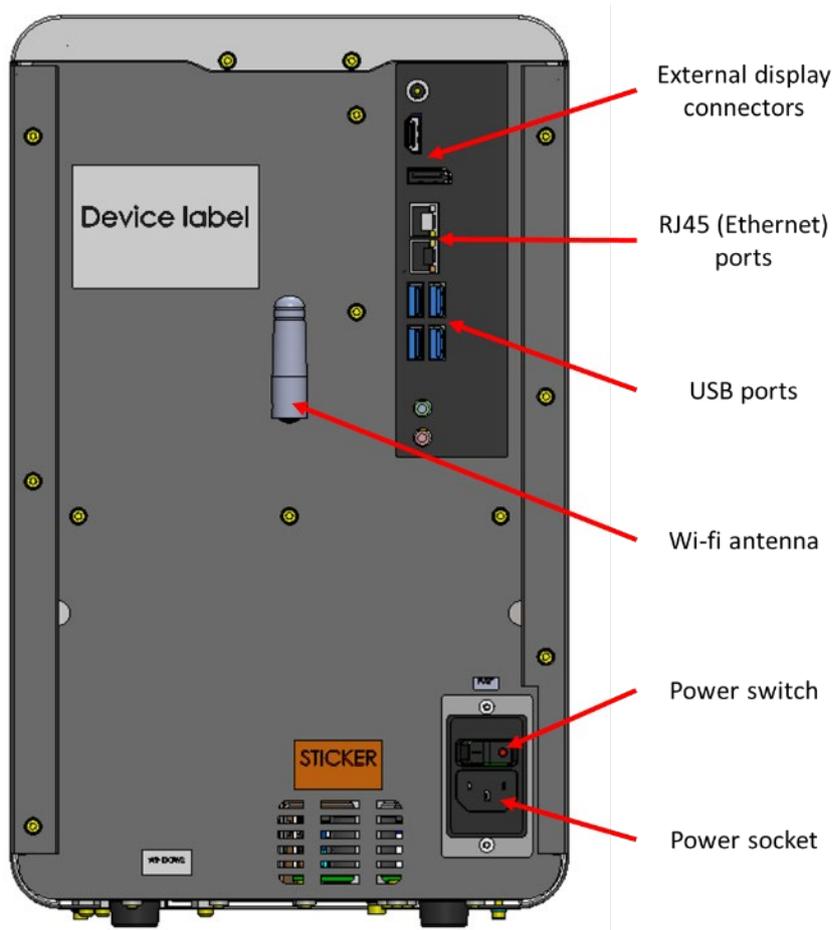
Figure 4: View of rear panel of Accellix Instrument

The following are connections that can be made to the Accellix Instrument with hardware components:

- **Internet connectivity** — In order to connect the instrument to the internet using a network cable, an ethernet network cable should be connected to the RJ-45 port at the rear of the Accellix Instrument (Connection should be performed using a network cable less than 3 meters or less). In addition, the instrument can be connected to the internet via Wi-Fi.

- **External memory drive** — A flash drive or external hard drive can be connected to the Accellix Instrument using one of the four USB ports located on the rear panel.

- **Printer connection** — A printer can be connected by connecting the printer-USB cable to one of the USB ports on the rear of the instrument, or by connecting to a network printer via ethernet cable or Wi-Fi.

- **Peripherals** — If needed, e.g., for troubleshooting or touchscreen issues, a mouse and/or keyboard can be connected to the instrument using the USB ports on the rear panel of the instrument.

- **Barcode scanner** — An external barcode scanner, e.g., for automatic input of the sample ID, can be connected to the instrument at one of the USB ports on the rear panel of the instrument.

User Logins

If a device is configured to require user logins, the **User Login** screen (Figure 5) is displayed when the device starts up. (If user logins are not required, the device will start up as described below in *Operating the Accellix Platform.*)
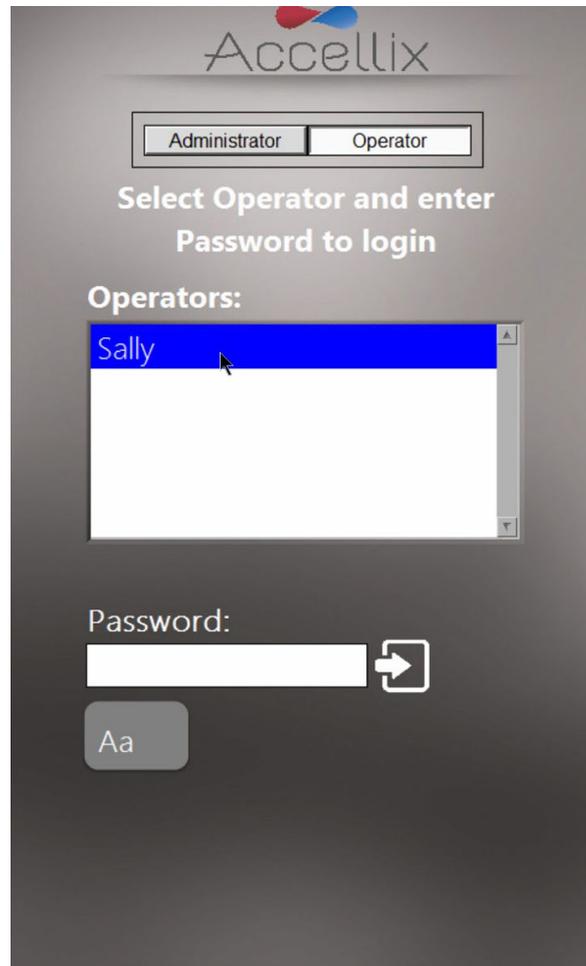

Figure 5: The User Login screen

There are two types of users with two distinct capabilities: **Administrators** and **Operators**.

Log in as an **Operator** in order to run an assay.

Log in as an **Administrator** in order to perform any of the following tasks:

- Create and manage new users
- Configure login options
- Set system parameters (see chapter on *Administrator Settings*)
- Copy, edit, print or export the audit trail
- Set various parameters including backup location, what files to copy when backing up, deleting old data, view errors, etc.

TO LOGIN:

1. Select a user from the list.
2. Enter selected user's password.
3. Tap the **Log in** icon ![Log in icon] or hit the **Return/Enter** key on the keyboard.

Note: Tapping the **Keyboard** icon ![Aa icon] will display a virtual on-screen keyboard.

Once the correct password has been entered, the **Change Password** icon ![Change Password icon] and the **Next** icon ![Next icon] appear.

TO CHANGE PASSWORD:

1. Tap the **Change Password** icon ![Change Password icon]. The **Change Password** screen (Figure 6) is displayed:
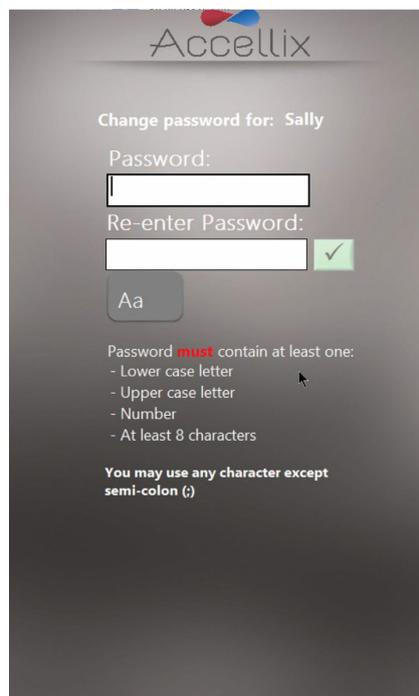

Figure 6: Change Password screen

2. Enter the new password twice, identically.

The **Ok** icon ![Ok icon] <u>only</u> becomes active if both passwords entered are identical and any other conditions are met. Required password conditions are:

- Minimum password length is 8 characters
- Must contain at least 1 upper-case letter
- Must contain at least 1 lower-case letter
- Must contain at least 1 number
- May contain any symbol (e.g., #@%, etc.) except semi-colon (;)

Note: A new password cannot have been used before by the same user.

Tap the **Next** icon to display the **Home** screen (Figure 14).

Note: The **Home** screen will now have a **Log out** icon [icon] in the top right-hand corner.

Main Administrator Screen

When an Administrator logs in, the **Main Administrator** screen (Figure 7) is displayed:
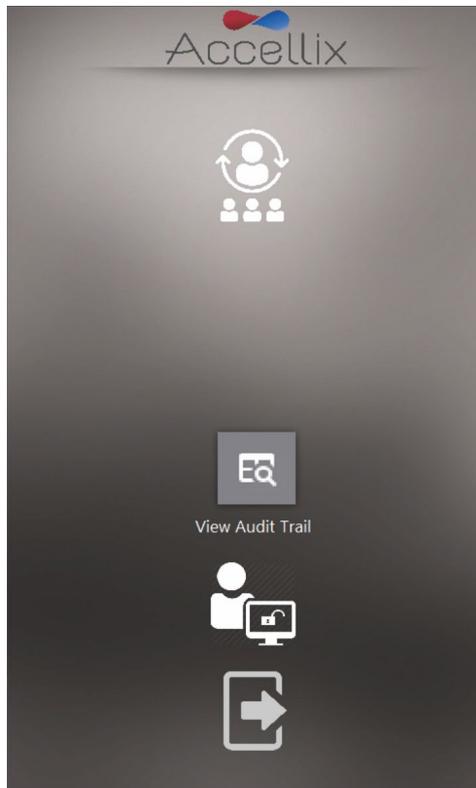

Figure 7: Main Administrator screen

As many as 4 icons are displayed:

- **Personnel Settings** (adding and editing users and log in options)
- **View Audit Trail** (displays audit trail for viewing, printing, or exporting)
- **General Admin Functions** (see chapter **Administrator Settings**)
- **Logout**

Note: Depending on how your system is configured, the **General Administrator** icon may or may not be visible.

Personnel Settings

TO EDIT USERS AND LOG IN OPTIONS:

1. Tap the **Personnel** icon ![icon]. The **Personnel** screen (Figure 8) is displayed:
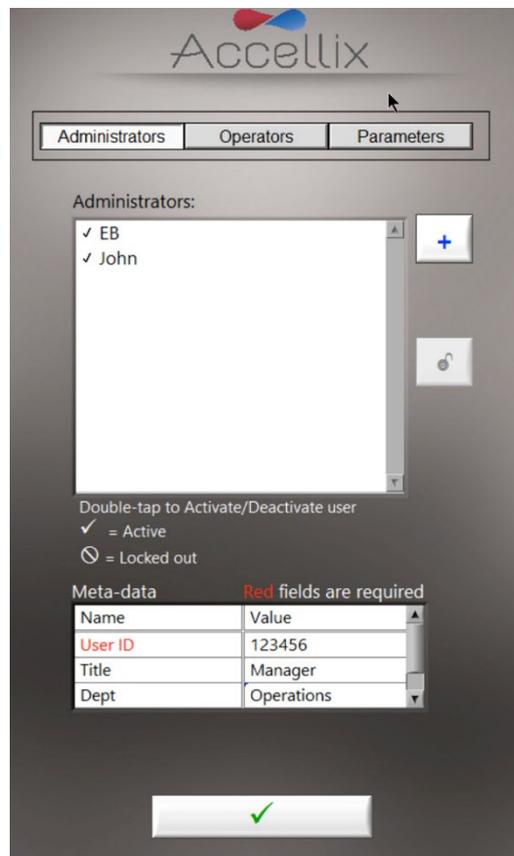

Figure 8: Personnel screen showing example Admin Users with Example Meta-data

The **Personnel** screen has three options at the top: **Administrators**, **Operators** and **Parameters**.

When **Administrators** or **Operators** is selected, the software allows for the addition, unblocking, activating, or deactivating of a user. In addition, any meta-data for that user can be edited.

Note: Meta-data fields which are required are in red. The window cannot be closed until all required fields are filled.

2. Double tap on a username to toggle activation and deactivation.
3. Tap the **Ok** icon ![icon]. The changes are saved.

KEY:

Check mark   User active

No check mark   User inactive (cannot login)

Locked Out ⃠   User locked out (cannot login)

Unlock 🔓   Select username and tap to unlock

Add +   Add user (see Figure 9)

TO ADD A USER:

1. Tap the **Add** icon ┃ + ┃. The **Add User** screen (Figure 9) is displayed:
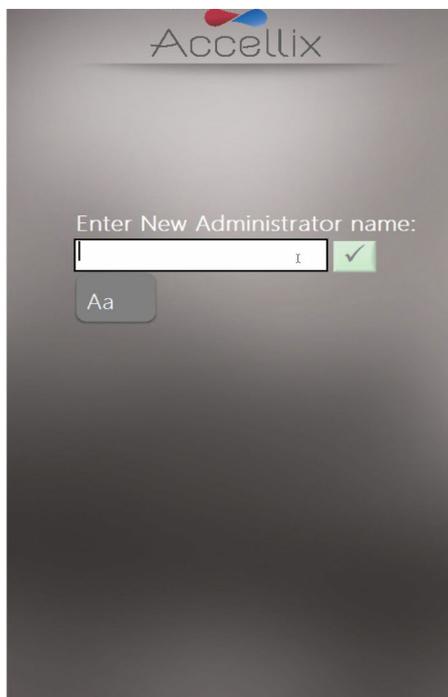

Figure 9: Add User screen

The **Ok** icon ☑ only becomes active when a valid username is entered.

Note: A username cannot be blank or consist of only spaces, nor can it contain any of the following characters: * \ / " : < > ? | _ % # & { } $! ' @.

2. Enter a new username and tap the **Ok** icon. The username is added to the list of users.

Note: All new users are required to change their passwords when logging in for the first time.

TO CHANGE PARAMETERS:

o Tap **Parameters** at the top of the **Personnel** screen. All changeable login parameters (Figure 10) are displayed:

Figure 10: Login Parameter Options

o Change parameters as required and tap the **Ok** icon [✓]. The changes are saved.
o Meta-data fields displayed in Figure 10 are examples only.

The following parameters can be set:

Max failed log in attempts: Sets the maximum number of times a user can attempt to login before being locked out.

Time between failed log ins: Sets number of minutes to wait before resetting "number of failed attempts" to zero, and the "Max failed Login attempts" has not been reached. For example, if a user enters 2 incorrect passwords, and the "Time between failed log ins" is set to 30 minutes and "Max failed log in attempts" is set to 3 attempts, then after 30 minutes that user can try an additional 3 times as the "number of failed attempts" is reset to 0.

Max days between new passwords: Sets the number of days to transpire between the last time a user changed his/her password until it is required to be changed again.

Inactivity log out time: Sets the amount of time (minutes) with no activity after which the user will be automatically logged out.

Password format requirements: Passwords must contain at least one character for each type selected.

Add (meta-data fields): Allows for adding a new meta-data field (type the name of the new field in the **Add** text box and tap the **+** button).

Edit (meta-data fields): Select a field name in the **Meta-Data Fields** list on the left. The name appears in the **Edit** text box on the right. Edit the field name and tap the **Ok** icon to the right.

Double-click to make required (=√): Double-clicking on a meta-data field in the **Meta-Data Fields** list box will make that field "required." When a field is required, a checkmark (√) will appear to the left of that meta-data field. Double-clicking on a "required" meta-data field will make that field optional and there will be no checkmark next to it (√).

Viewing/Exporting the Audit Trail

Tapping on the **View Audit Trail** icon View Audit Trail displays the **Audit Trail** screen (Figure 11):
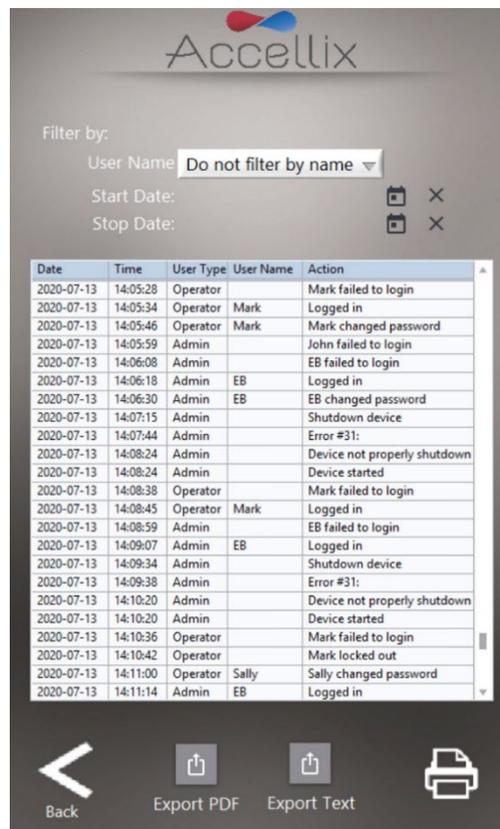

Figure 11: Audit Trail screen

The table is sorted by date and contains entries for the following columns per entry:

- **Date** activity was recorded
- **Time** activity was recorded
- **User Type** (Admin or Operator)
- **User** Name of the person performing the activity
- **Action** recorded

The **Filter by:** dropdown box allows the table to be filtered by Username. Filtering by date has not yet been implemented. If the Audit Trail is filtered, the subset of the Audit Trail that will be printed or exported.

To Export the Audit Trail:

- o   Tap the **Export PDF** icon. The table on the screen is exported to a PDF file.

    OR

o   Tap the **Export Text** icon. The table on the screen is exported to a standard tab-delimited text file.

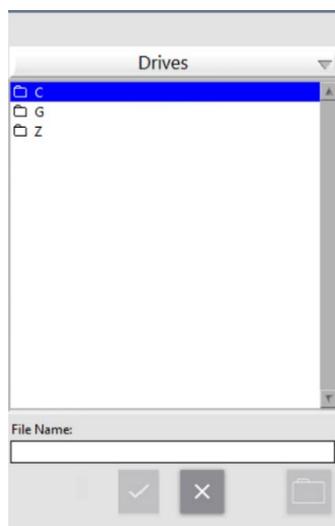The user is prompted to select a location and enter a name for the file (Figure 12):

Figure 12: Save File dialog

o   Tap the **Printer** icon to print the displayed table to the default printer.

Adjusting the Instrument Settings

The instrument should be configured for use by adjusting instrument settings, according to the following steps:

1. Turn on the instrument by switching the **Power switch** on the rear panel of the instrument to the '**ON**' position. While the instrument boots up, the display will inform the user that **System Self-check** is being performed (Figure 13):
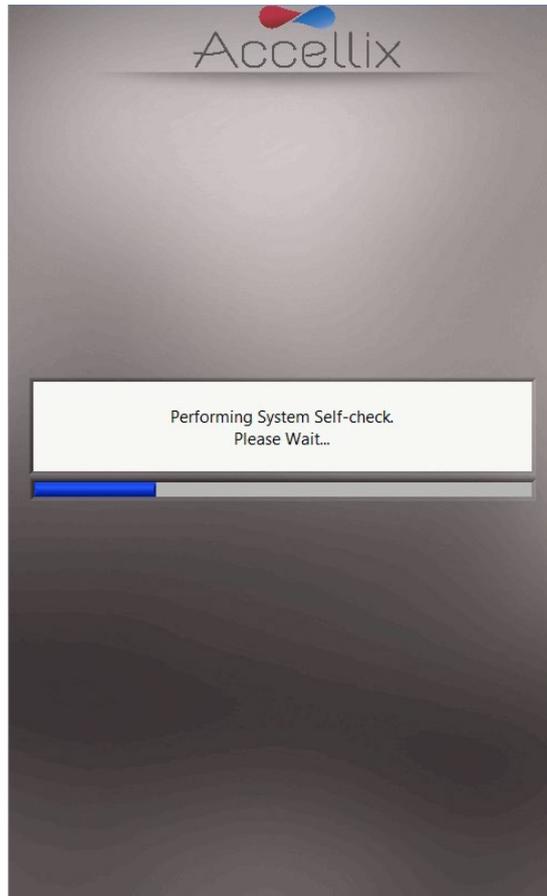
Figure 13: 'System Self-check' screen

2. Verify that system has successfully completed initialization, and that the **Home** screen (or the user login screen if logins are enabled) appears on instrument display (Figure 14).

    Note: Depending on your configuration, the **Settings** and **Administrator** icons may or may not be visible.
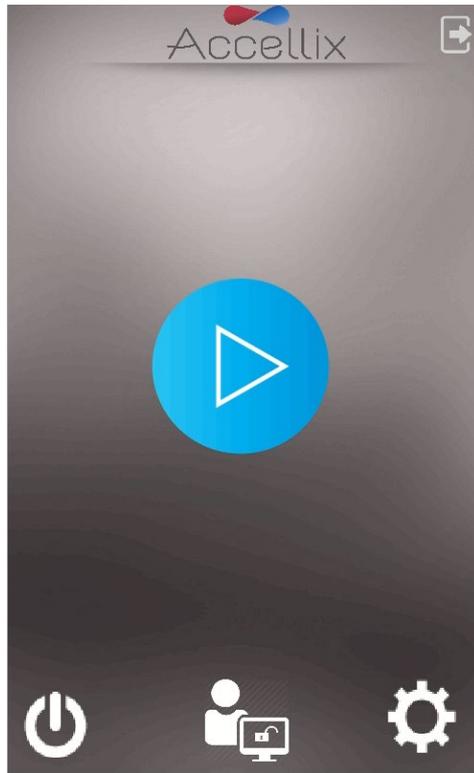
Figure 14: Home screen

3. Tap the **Settings** ⚙ icon at the bottom right of the **Home** screen to access the **Settings** screen (Figure 15).
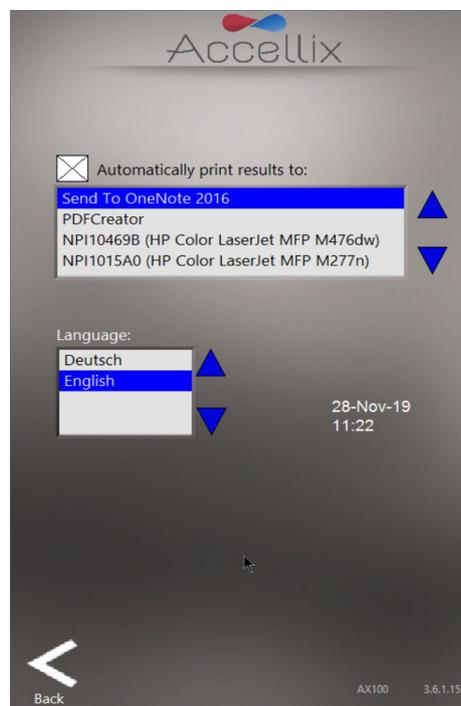

Figure 15: Settings screen

4. On the **Settings** screen, the user can check or configure instrument settings, as follows:

    ● **Printing Results** — If the checkbox is selected next to "**Automatically print results to:**" field, a printout will be sent to the printer which has been chosen from the list of available printers. If the checkbox is not selected, the results will not be printed automatically at the conclusion of a test run. However, even if automatic results printout is not selected, the user can manually print the results from the **Results** screen at test conclusion.

    ● **Instrument Date/Time Display —** The date and time set on the instrument are viewable from this screen along with the name of the device and the current version of the software.

5. Tap the **Back** icon to return to the **Home** screen.

    The Accellix instrument is now configured for use.

Administrator Settings

The settings on the instrument that can be defined or changed by an "Admin user" are accessed as follows:

1. Tap the **Administrator** icon at the bottom center of the **Home** screen (Figure 14).

2. Enter the password in the **Admin User Password Input window** (Figure 16) to access the **General Administrator Settings** screen (Figure 17).

    Note: The password window will automatically close once the correct password has been entered.

Figure 16: Admin User Password Input window

Note: To receive an Admin password, the user who has been authorized to act as the instrument administrator should contact Accellix Support at support@accellix.com.

If logins have been enabled and the user has logged in as an Administrator, no further password is required to reach the **General Administrator Settings** screen.

Figure 17: General Administrator Settings screen

3. On the **General Administrator Settings** screen, the user can enter or adjust the following settings:

● **Show Report —**

Displays a list of all results measured on this device which can be viewed and printed (Figure 18).

Figure 18: All Results screen

- **LIMS Database connection —**

  This screen can be used by the Admin user to configure settings to connect the Accellix Instrument to a site LIMS Database that uses the same protocol (H7). Admin users can input LIMS address using the on-screen keyboard, which is accessed by tapping the icon next to this field (Figure *19*).
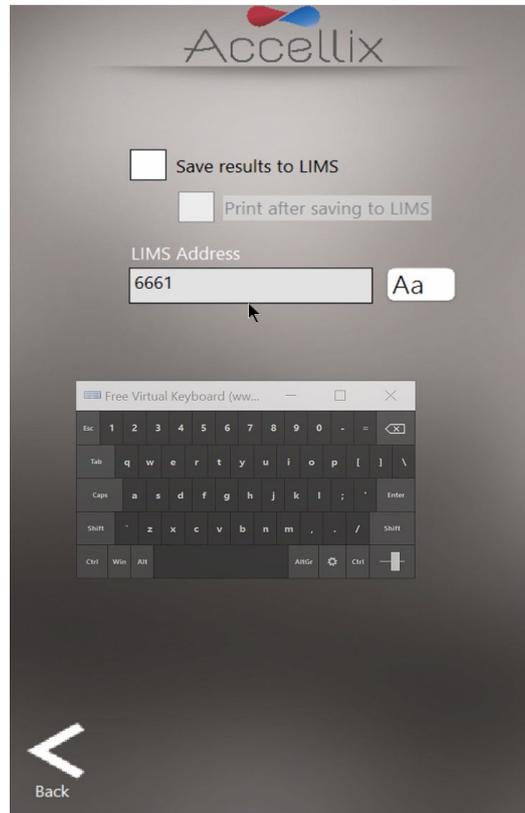

Figure 19*: LIMS Configuration screen*

- **Copy Previous Results function —**

  Admin users can copy or move results files from past test runs by selecting a date range (Figure 20) and tapping **Copy Now**. Cartridge data folders created between the selected dates are displayed below the two calendars.

  o If the **Partial** radio button is selected, only the assay results and the associated .csv and .fcs files are copied or moved:

    ▪ If the **Include raw data files** checkbox is selected, the software also copies or moves raw data files.

    ▪ If the **Include classification plots** checkbox is selected, the software also copies or moves all classification plots.

  o If the **Entire folder** radio button is selected, the entire data folder is copied or moved.

  o If **Copy** is selected, the software only copies files based on the above selected options.

o   If **Move** is selected, the software copies the files based on the above selected options and then deletes the original files if the copying was successful.

The copy destination is selected in the **Destination Location** function, as explained below (see Figure 24).

Note: When selecting the date range for copying results files, make sure to choose at least one day before and one day after the specific date range of interest.
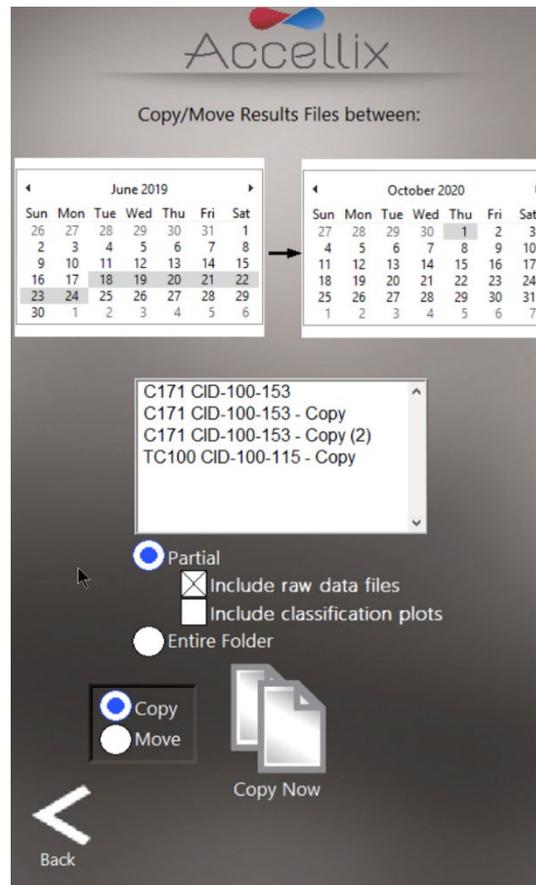
Figure 20: Copy/Move Results Files screen

● **Runs with Errors function —**

This window has two functions:

o   If **View Runs with Errors** is selected:
Files related to test runs for which errors were generated can be selected and copied (Figure 21). Individual cartridge data folders can be selected together by holding down the Control Key on an attached keyboard while tapping on an entry in the list. Tap the **Copy** Icon.

▪   The amount of hard disk space required to copy these files is displayed ("**GB to be copied**"), along with the space available on the destination drive ("**GB Available**"). The copy destination is selected in the **Destination Location** function (Figure 25).

o   If **View Log File** is selected:

The Log File Entries are displayed (Figure 22).
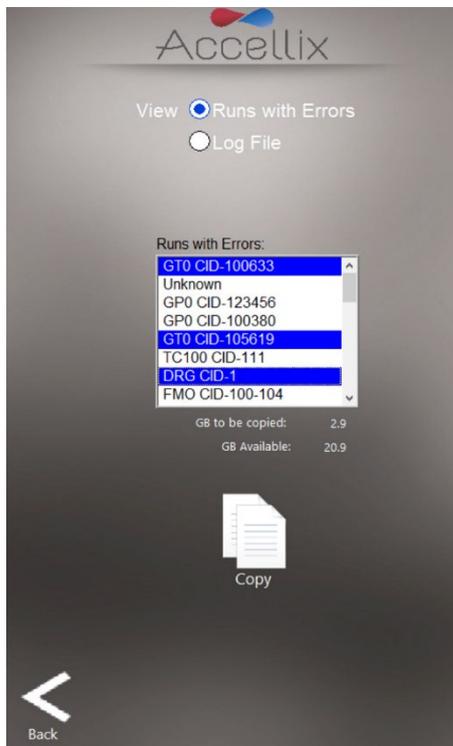
Tap the printer icon to print the log file.

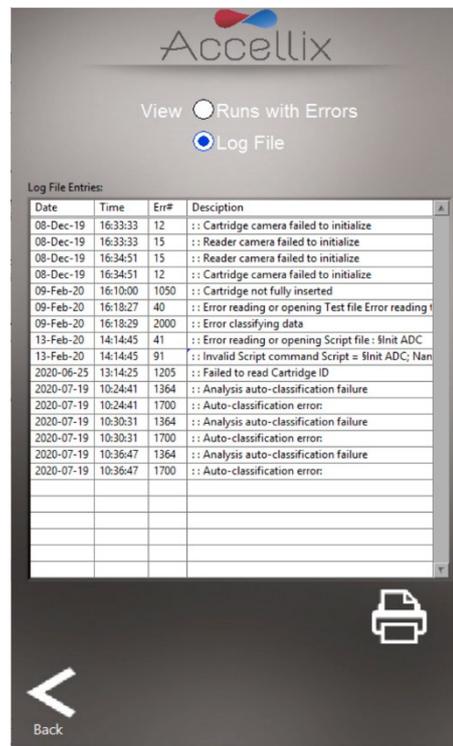Figure 21: Copy Test Runs with Errors screen   Figure 22: View Log File screen

Delete Raw Data function —

The Admin user can use this function to free up space on the internal hard disk on the instrument.

Tapping this icon deletes large raw data files created from each test run executed on or prior to the date selected in the date field (Figure 23).

- ▪ Only folders containing data created on or before the date input are deleted.

- ▪ The window displays all folder names to be deleted in the list below the date.

- ▪ The space to be reclaimed is displayed in GB below the date.

> **Note:** The result output files, e.g. '.fcs' file, results report files, etc. for each test run on the instrument are always retained on the internal instrument memory; they will not be deleted when this function is used <u>unless</u> the **Delete entire folder** checkbox is checked.
>
> ⚠️**Warning**: Selecting the **Delete entire folder** checkbox and tapping on the **Delete** icon deletes all data folders displayed in the list. This action is **NOT** recoverable (data will be permanently deleted).
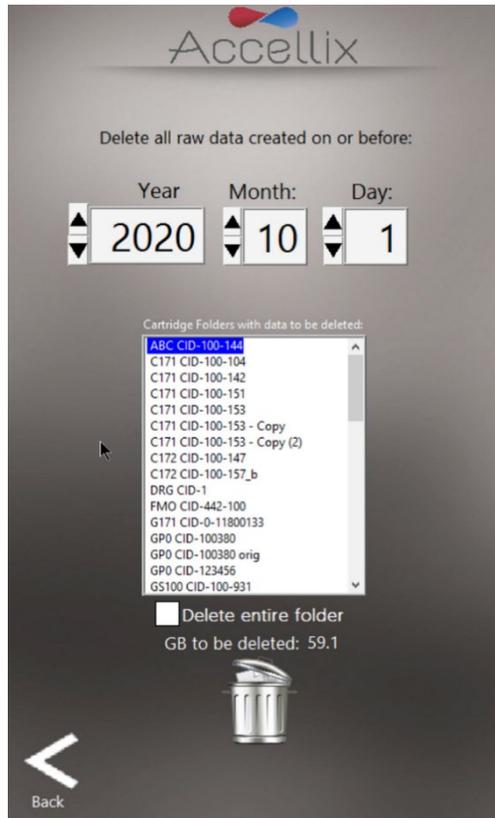
Figure 23: Delete Raw Data files screen

● **Copy function: —** Copy

This setting determines what results should be copied to the destination location at the conclusion of an assay run. If the checkbox next to "**Delete after copy**" is selected, a cartridge's entire data folder will be deleted from the internal hard disk after being successfully copied to the destination location (Figure 24).

● **Destination Location -** The destination where the results should be copied to is displayed in the field directly below the **Delete after copy** checkbox. Set the path by using the folder icon next to the destination location field (see red box in Figure 24).

Figure 24: Copy and Destination Location section

Tapping the folder icon displays the **Set Data Destination Configuration** screen (Figure 25):

Figure 25: Set Data Destination Configuration screen

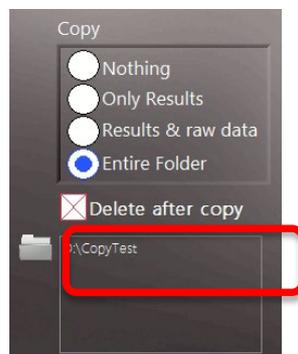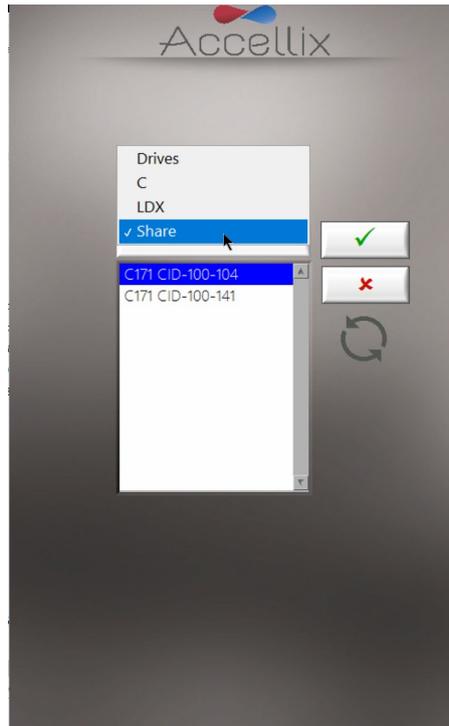- The pop-up menu allows the user to navigate up the hierarchy of the folder structure. The currently selected folder is the one at the bottom of the hierarchy. To select the relevant path, select the specific location by double clicking on it and then tap: [✓].
- The contents of the currently selected folder are displayed in the list box below the pop-up menu. By selecting **Drives** in the pop-up menu, a list of all available drives is displayed in the list box.

KEY:

[✓]	Saves the current folder as the destination for all data to be copied.
[✗]	Cancels any changes and leave the destination location as it was before entering this screen.
[↻]	Rescans the currently selected folder and updates the list of its contents.

Note: All files, including raw data files, results reports, etc., generated by instrument for any test run, are automatically stored in the instrument's internal hard disk. This location is not accessible by users but can be accessed upon request by Accellix Support.

Note: The raw data (.bin) files are each approximately 1.25 GB.

- **Limit Cartridge Data Folders**

When the **Limit Cartridge Folders to:** checkbox is selected (Figure 26), the software retains only the newest *N* folders (where *N* is the number typed in the field next to **Limit Cartridge Folders to**). All older cartridge data folders are deleted.

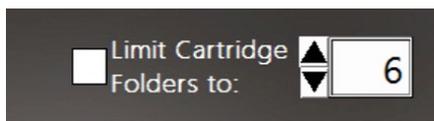> ⚠️ **Warning**: Please **note** that deleted data cannot be restored.

Figure 26: Limit Cartridge Data Folders controls

Operating the Accellix Platform

To successfully operate the Accellix Platform, an operator is expected to undergo basic training procedures which include instructions on operating the instrument, safety procedures, troubleshooting techniques, and instructions regarding the instances when the manufacturer should be contacted for service. This training should be performed by an Accellix Field Applications Scientist, or by an experienced operator who has undergone training with an Accellix Field Applications Scientist.

The Accellix platform performs flow cytometric reading of an assay sample according to test parameters defined in the technical data sheet of the relevant assay.

TO RUN AN ASSAY ON THE ACCELLIX INSTRUMENT:

1. If logins are enabled, select an Operator and log in (the Start screen will then appear).

2. Introduce specimen into the cartridge according to the relevant protocol for the cartridge type. (Refer to the Technical Data Sheet and Instructions for Use for details and instructions for each Accellix assay type or https://www.accellix.com/technical-resources/ .)
   After the sample plug/seal has been closed, the test should be started without delay.

3. There are 2 ways to run an assay:

1. On the **Home** screen display, tap the **Start** icon ▷ and follow the instructions displayed on the instrument's screen.

2. Open the door, insert the cartridge and close the door. If a user login screen is displayed, log in using the operator credentials and then tap the **Start** icon ▷. Follow the instructions displayed on the instrument's screen.

Note: From this point forward, the progress of the test procedure can be monitored by noting which of the gray dots that appear at the bottom of the screen is currently highlighted.

4. Prepare to insert the properly loaded cartridge into the Cartridge Handling Unit (CHU).

5. When prompted by the instrument (Figure 27), open the door by pressing down on the front right-hand indent corner of the door and releasing. Insert the cartridge into the instrument by pushing it down using the top handle, then, when the cartridge is inserted, push the handle on the right-hand side of it a bit more until a click is heard and felt, ensuring that the cartridge has been inserted fully into the instrument Cartridge Handling Unit.
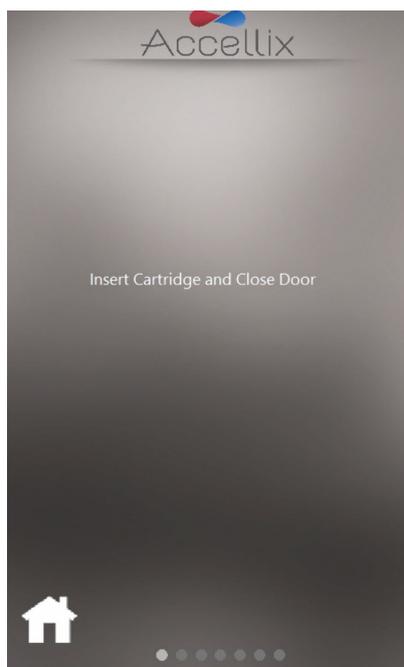

Figure 27: Insert Cartridge screen

6. The screen instructs the operator to wait while the instrument reads and registers the information contained in the QR code on the cartridge (Figure 28).
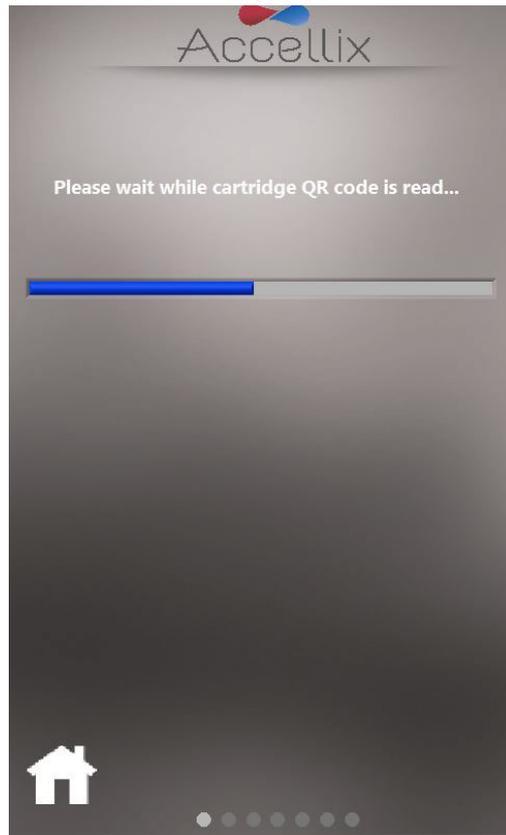
Figure 28: Reading Cartridge QR Code screen

7. **Enter Sample ID screen** (Figure 29) - enter Sample ID using the on-screen keypad, by using an external keyboard or barcode scanner. The Sample ID will then be displayed on all subsequent screens of the test run.

    Note: It is not possible to continue until at least one character has been entered as Sample ID. This may not be any of the following characters or only spaces: * \ / " : < > ? | _ % # & { } $! ' @.

    Note: An optional configuration of the software requires the operator to also enter a Kit Number.
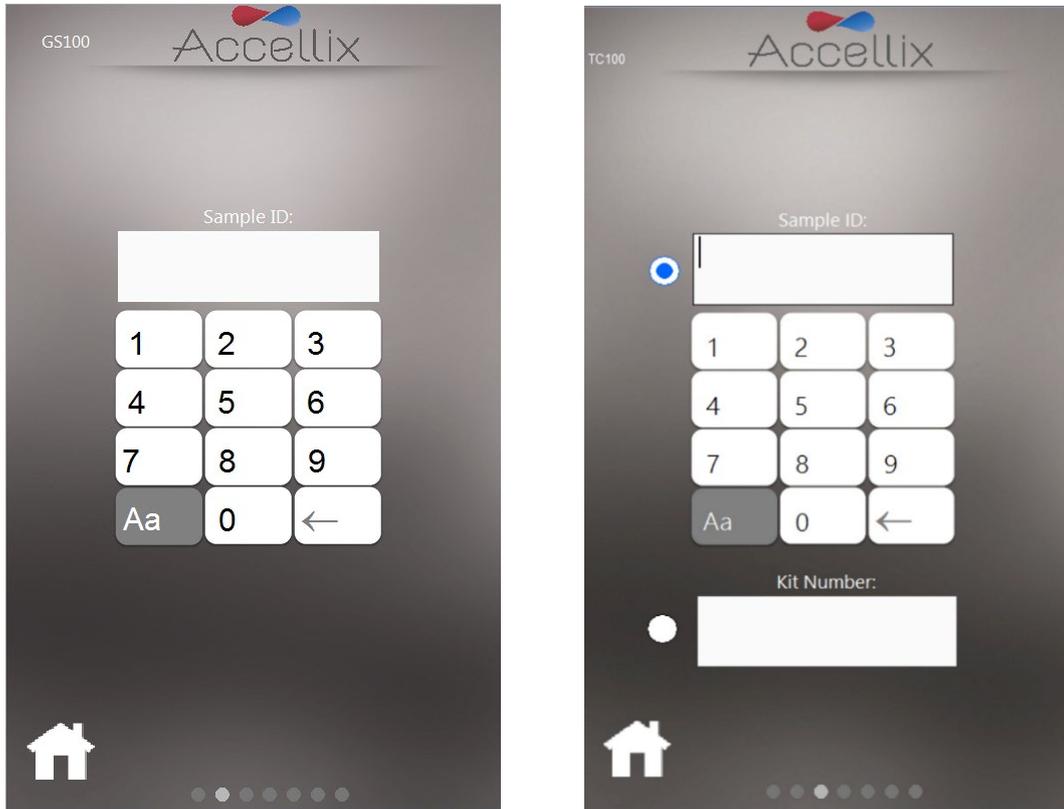
Figure 29: Enter Sample ID screen (with and without Kit Number)

8. Once the Sample ID (and Kit number if so configured) field is no longer empty, the Next ![Next] icon appears.

9. Tap **Next** to continue.

10. **Confirmation screen** (Figure 30) - The instrument screen now displays assay/cartridge type and Sample ID (and kit number if so configured) for the operator to confirm before commencing the assay run.

Confirm that the values are correct by tapping **Next**.
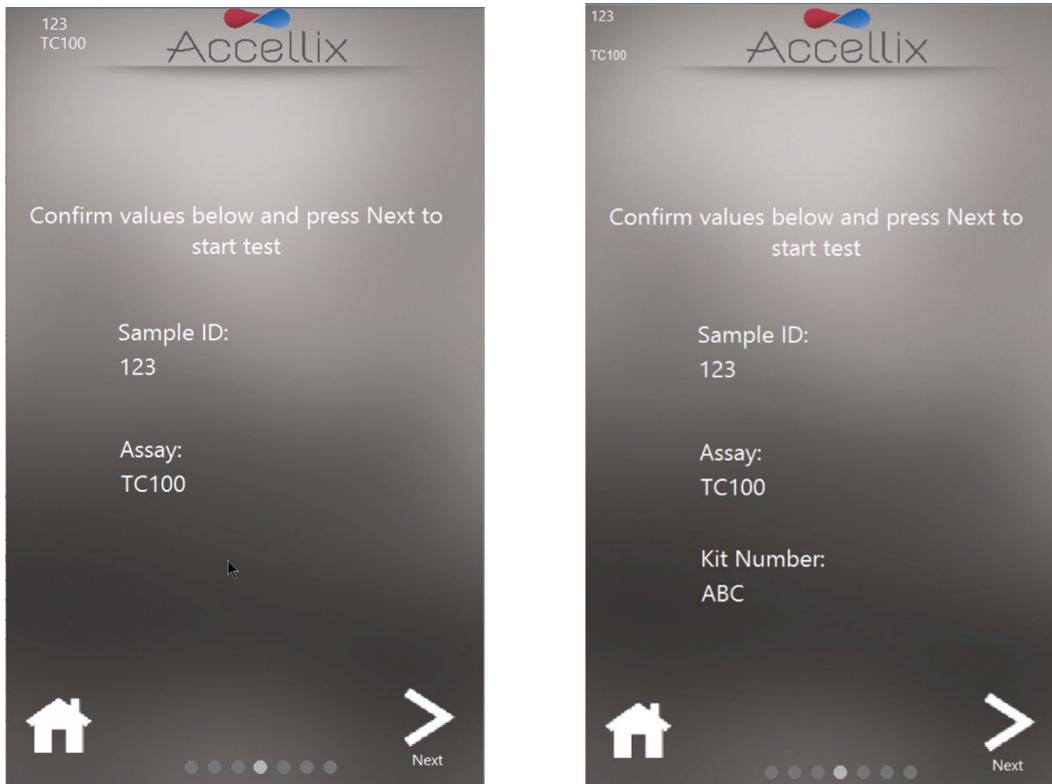
Figure 30: Confirm Sample ID and Assay/Cartridge screen (with and without Kit Number)

Note: Tapping on the **Home** icon aborts the assay and returns to the **Home** screen after performing a self-check and requiring the user to remove the cartridge and close the door. This is useful in case incorrect information was entered or the run needs to be stopped for any reason.

11. After tapping **Next**, the test proceeds in accordance with the specific parameters relevant to selected assay/cartridge type.

12. **Progress screen** (Figure 31) displays a progress indicator and **Time Remaining** countdown timer. The operator can monitor the test progress and approximate time remaining.
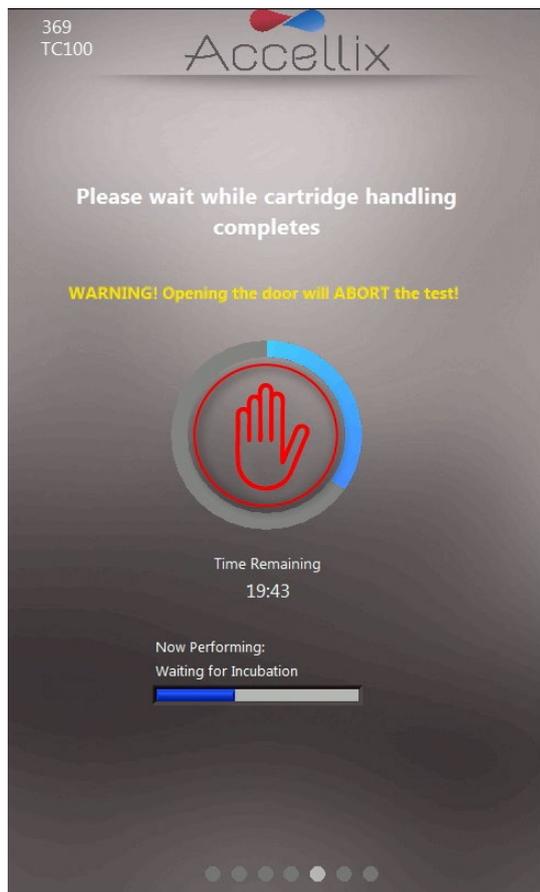
Figure 31: 'Progress Indicator and Time Remaining' screen

Aborting a Running Assay – Take caution not to inadvertently open the instrument door during an assay run, as opening the door will abort the assay underway. In addition, do not attempt to remove the cartridge while an assay is running on the instrument. A cartridge should only be removed from the instrument once the "Open door and remove cartridge" message appears on the screen.

Note: If an operator wishes to stop an assay while underway, this should be done by tapping **Stop,** i.e., the red hand at the center of the progress indicator (see Figure 31). Refer to *Termination of an Assay Run* section below.

Note: Aborting an assay displays a dialog asking the operator to confirm the abort and add a comment as to why the operator aborted the run. If so configured, the comment may be mandatory.

Note: if a physical keyboard is not attached to the device, a virtual keyboard can be displayed by tapping on the keyboard icon.
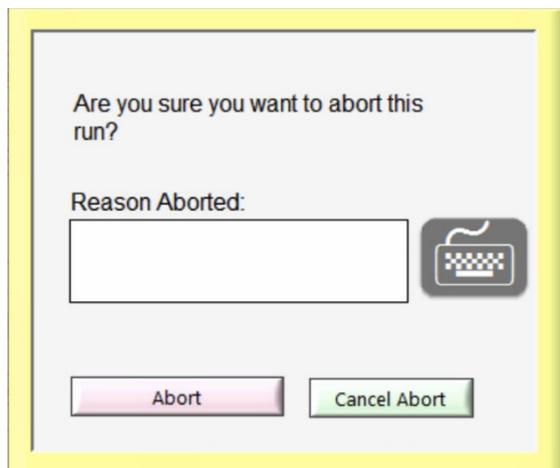
Figure 32 - Confirm Abort Dialog

13. **Results display**: When the test has been successfully completed, results are copied to the backup location and the instrument informs the operator by displaying any one of 4 results screens (depending on how the assay is configured): No Results, Pass/Fail, Total Bead Count only or an on-screen table with all results.

The following two screens are examples of potential result displays (Figure 33 and Figure 34):
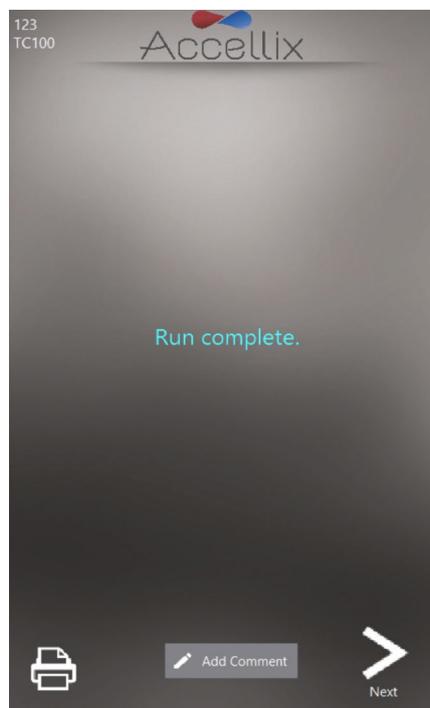
Figure 33: Example of Run Complete screen
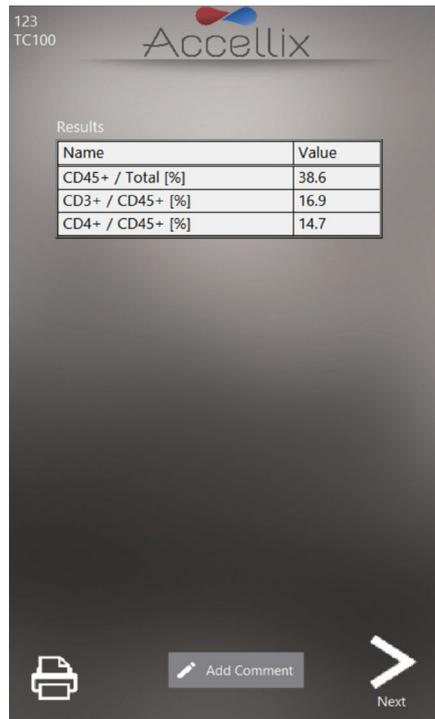
Figure 34: Example of On-screen Results Report

a. For an assay which produces an on-screen results report, e.g., T Cell RTF (L) Assay, a **Results** screen will be displayed on the screen at this point. See example of on-screen **Results** report in Figure 34.

b. For an assay which generates a **Results** output, a printable report will also be generated. The report will be printed automatically at this stage if this was configured in the **Settings** screen, prior to initiating the assay.

c. If automatic printout was not configured, or if the operator chooses to print to an alternate printer, a manual printout can now be initiated by tapping on the **Printer** icon at the bottom-left of the **Results** screen. Operator may select desired printer from the **Printers** list, and then tap **Printer** icon to execute the manual printout.
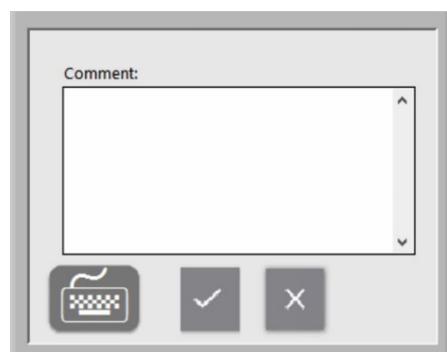
Figure 35 - Comment Window

d. If desired, a comment can be added to the Assay Results.pdf by tapping on the Add Comment button and adding a comment in the resulting Comments window as illustrated in Figure 35.

Note: if a comment is added, a new PDF is generated called "Assay Results with Comment.pdf". This PDF will be copied to the backup location once the Next button is tapped on the Results screen.

Note: if a physical keyboard is not attached to the device, a virtual keyboard can be displayed by tapping on the keyboard icon.

14. Tap the **Next** icon when ready to conclude the assay process.

On-screen instructions (Figure 36) prompt the operator to open the instrument door, remove the cartridge, and finally to close the instrument door.

Note: It is important that the instrument door remains closed between assay runs, to prevent foreign particles from entering the instrument interior.
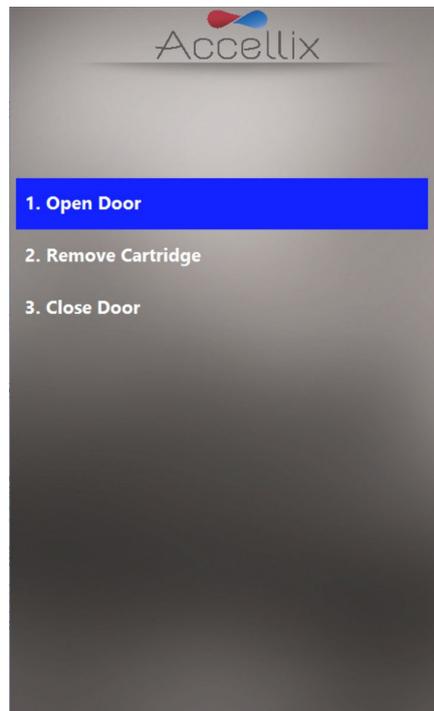
Figure 36: Remove Cartridge screen displayed following conclusion of test

15. The software returns to the **Home** screen.

16. The cartridge should now be disposed of in a suitable biohazard waste receptacle in accordance with organizational policy and/or local regulations.

TO RUN A MULTI-CARTRIDGE ASSAY:

a. The **Multi-cartridge Remove Cartridge screen** instructs the operator to remove the first cartridge and insert the next cartridge in the sequence (Figure 37).
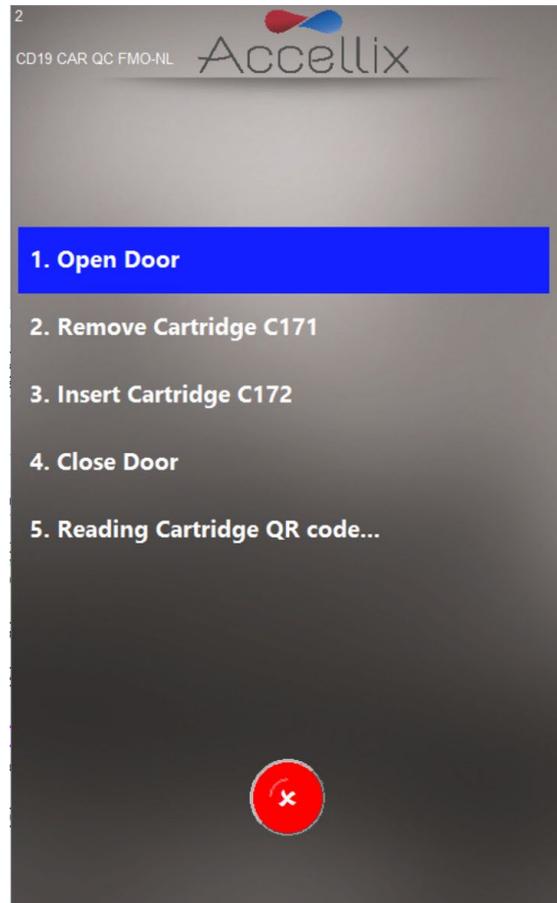
Figure 37: Multi-cartridge Remove Cartridge screen

b. If the operator does not insert the correct type of cartridge, the operator is instructed to remove the incorrect type and insert the correct type (the software scans the QR code upon insertion of the next cartridge to determine if it is of the correct type to run next).

Note: The operator may abort the programmed continuation with the next cartridge by tapping the red ⊗ **Abort** icon.

c. Once the correct next cartridge of a multi-cartridge assay has been inserted, the software will display the **Confirm Sample ID and Assay/Cartridge** screen (Figure 30) and continue with that cartridge.

TERMINATION OF AN ASSAY RUN:

The **Stop** or **Abort** icons may be used to terminate an assay run (Figure 31 and Figure 37).

If an assay is stopped during the run, a message is shown on the screen (Figure 38), while the system returns the cartridge to home position. Homing of cartridge may take some time, as the test scripts must be aborted, and internal motors moved to their home positions.
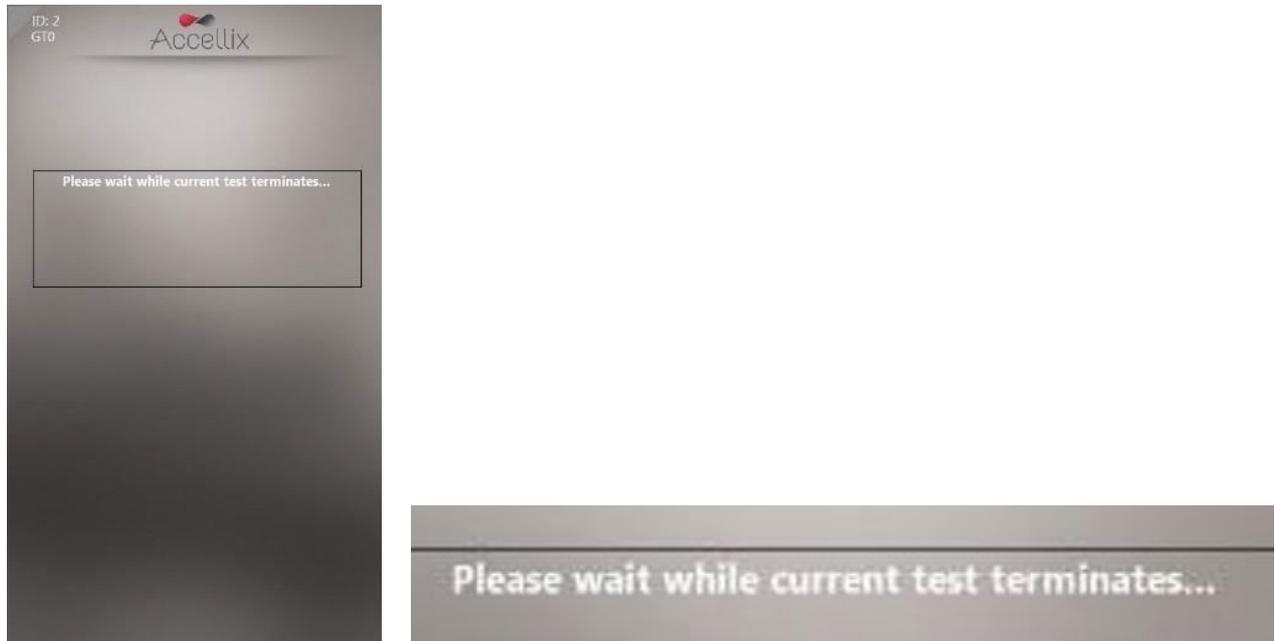
Figure 38: On-screen message following termination of assay run

Note: Only after the on-screen display instructs the operator to remove cartridge should operator attempt to remove cartridge from instrument.

Shutting Down the Instrument

The instrument can be left powered on, and there is no need to shut it down regularly.

TO SHUT DOWN THE INSTRUMENT:

1. On the **Home** screen, tap the **Shutdown** Icon ⏻.

   The operator is prompted to confirm the shutdown (Figure 39).
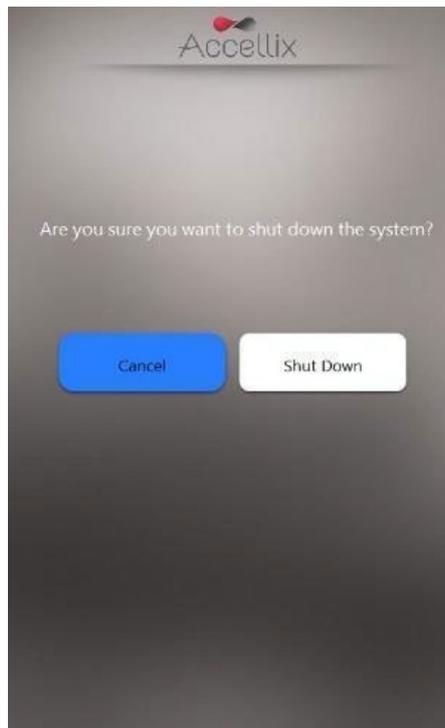
Figure 39: Confirm Shut Down screen

2. Shutting down the instrument is a 2-step process:

   a. Tap the **Shutdown** icon to start the power down sequence.

   b. Once the device's screen is black it is safe to turn off the physical power switch on the rear panel of the device. Shutdown is completed only after the power switch on the rear panel of the device is off.

To turn the instrument back on, move the **Power** switch on the rear panel of the instrument to the **ON** position.

Troubleshooting

There are two basic types of unexpected issues which can arise when using the Accellix device:

- issues related to a cartridge
- issues related to the instrument

Cartridge Issues

The following scenarios may invalidate a cartridge run:

→ The system does not recognize the cartridge QR code.

→ The cartridge is past its expiration date.

→ Analysis of the sample fails.

→ Run aborted due to door opened during run

Specific instructions for each error type are provided on-screen (Figure 40).

Figure 40: Example of Error Message

In all such cases the cartridge should be removed, and the door closed to return to the **Home** screen.

Instrument Issues

With the exception of **Hard Disk Full warning** (see below), recovery from all other anomalous behavior of

the device can be performed by tapping the **System Self-Check** icon ![System Check] or by turning the

device off and then back on. If the System Self-Check/Restart does not help, report the error to Accellix Support. Refer to the Accellix Troubleshooting User Manual for further information on reporting to Accellix Support.
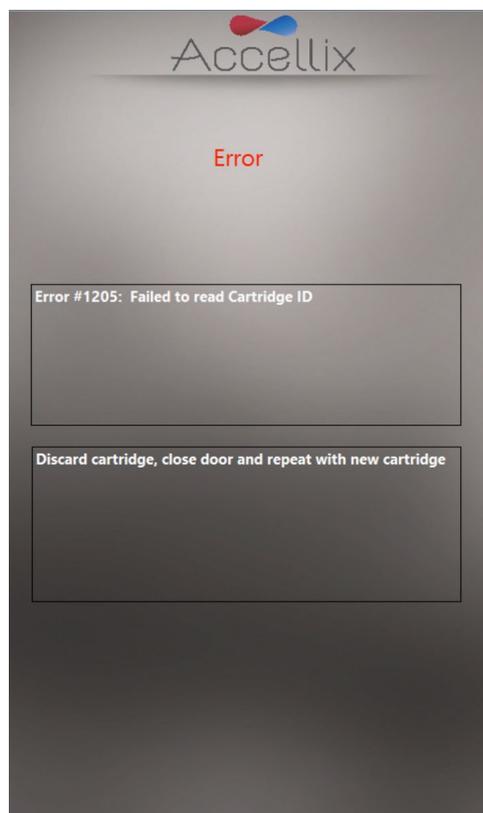
Upon completion of a successful System Self-Check, the system returns to the **Home** screen to allow the user to run another test.

Hard Disk Full warning:

The exception to most hardware-related instrument issues is when the device's hard disk is full. The Accellix Instrument stores data files generated for each assay on its internal hard disk, which may become nearly full after a certain number of assay runs. Thus, prior to executing an assay run, the instrument checks that a minimum amount of hard disk space is available to be able to successfully complete an assay run. If the **Hard Disk Full** warning (Figure 41) is displayed, hard disk space must be freed to execute further assays.
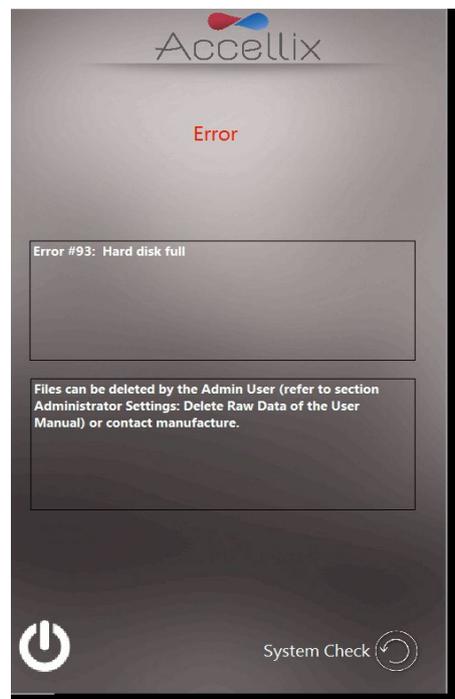
Figure 41: Hard Disk Full warning screen

Hard disk space can be freed by the Admin user using the **Delete Raw Data** function — ⚠ (see instructions regarding Figure 23 above in *Administrator Settings*) or by using the **Move** option from the **Copy Files** function (Figure 20). If further assistance is needed, contact Accellix Support.

Touchscreen Issues:

If the touchscreen does not respond, the user can connect an external mouse and keyboard, as well as a barcode scanner as described in *Installation of Computer* Hardware above.

Other Issues:

In rare instances, inaccurate results may occur due to incorrect usage of the instrument. The instrument should be used in strict accordance with this User Manual. If instrument performance issues are suspected, Accellix Support should be contacted.

If the system does not start, or for further troubleshooting instructions, contact Accellix Support.

Handling Instructions

- Handle the instrument with care. Once installed, the instrument should not be moved. If the instrument requires moving after installation, contact Accellix Support.

- Protect the system from direct sunlight, humidity, and dust.

- Operate only at permitted environmental operating conditions, as follows:

    o Operating Temperature: 20-25°C (68-77°F)

    o Max. Rel. Humidity 85%, Non-condensing

- For information on instrument dimensions and power, refer to *Appendix A – Technical Specifications*.

Maintenance

Annual maintenance of the instrument is recommended. For safety and best results, take note of the following:

- **On-screen Instructions** — The user should follow the instructions provided by the error messages. (See Troubleshooting section above.)

- **Laser Safety note —** This instrument is classified as a Class 1 Laser product, according to IEC-60825-1 edition 3. Internally, the instrument uses a 50mW, 488nm Class 3B laser. The user/technician should never open the laser.

- **Network Connectivity** — If the instrument is to be connected to a local area network (LAN), Wi-Fi network, or to a network printer, this should be performed in consultation with qualified IT personnel. (Connection to a user LAN should be performed using a cable less than 3 meters in length.)

- **Cleaning the System** — Accellix instrument may require cleaning from time to time. In order to maintain the integrity of all Accellix components, perform cleaning according to the following procedure: Wipe the affected instrument surface with any of the materials listed in the next paragraph. Follow the directions provided with the cleaning product.

- **Decontamination** – If a cartridge is damaged after having been inserted into the instrument, biohazardous material may leak into the instrument. In such a case, wipe down the front, sides, top, and bottom of the instrument with Pursept® disinfecting wipes, Medipal 3in1® Disinfectant Wipes, or other similar ethanol based wipe and then wrap a wipe around a long Q-tip and use it to thoroughly wipe the CHU opening. All blood products should be treated as if they may contain pathogens.

- **Disposal Procedure** – The instrument should be disposed of according to local regulations regarding electronics and medical equipment waste. Dispose of used cartridges as a biohazard in accordance with local regulations.

- **Service Manual** – No servicing is to be performed by the user. All servicing is to be performed by an Accellix Field Application Scientist, according to manufacturing and re-work procedures. For servicing, see Customer Support contact information at the end of this document, and/or see manufacturer website at www.accellix.com.

- **Shipment for Service** – In case shipment for service is required, contact the manufacturer. Customized shipping container and materials, and a packing/shipping procedure will be sent to allow for secure shipment of instrument. Following usage where the instrument is considered contaminated, it should be enclosed in the provided biohazard bag, and then placed inside the shipping container.

- **Calibration** - The instrument performs a self-check to ensure that the functionality of the instrument is tested. If calibration is required for a certain cartridge or assay type, the details of the nature and frequency of the calibration needed to ensure that the instrument operates properly and safely will be described in the Technical Data Sheet for each assay kit.

Assay-Specific Information

Assay-specific information is provided in the Technical Data Sheet and Instructions for Use for that specific assay which is included with each shipment of assay kits.

Appendix A – Technical Specifications

| Instrument Description	Specification
Instrument Dimensions	37 x 23 x 51 cm; 13.5 kg
Electrical Requirements	100-230V AC, 50/60Hz; Power draw: steady-state 35W, peak 90W
Replaceable Fuse	250V, 3A
Operating environment	Operating Temperature: 20-25°C (68-77°F) (max. rel. humidity: 85%, non-condensing) System should be protected from exposure to direct sunlight, humidity, & dust Instrument should have clearance of at least 20cm (8 inches) from both sides
Excitation Laser	488nm, cyan (40-50mW)
Fluorescence Detector	High-performance SiPM (silicon photomultiplier) array (11 channels)

Instrument Description	Specification
Fluorescence Detection Range	510–800 nm
Forward Scatter Detection	Si PD (silicon photodiode); Collection angle: 6-11deg
Focus and Alignment of Optical platform	Real-time focus and excitation alignment, utilizing proprietary image analysis control algorithm
DAQ A/D Resolution, Sampling Rate	16-bit, 100kHz
Software	Accellix custom software, running on embedded PC; Operating System is Windows 10® Enterprise 2016 LTSB (64-bit)
Test Run Automation	Via control of instrument motors that provide functionalities including the following: ● Auto-focus ● Auto-alignment ● Reagent injection/fluid release from cartridge blisters (x3) ● Sample mixing ● Sample reading
Cartridge Description	**Specification**
Cartridge Dimensions	7.9 x 8.5 x 1.2cm
Performance Characteristics	See assay kit Technical Data Sheet
Sample Carryover	None, due to single-use cartridge
Sample Type, Sample Volume, Sample Limitations	Assay-specific and test-specific information can be found in the Technical Data Sheet included with assay kit.
Cartridge Backbone Material	Cyclic olefin copolymer (COC)

Cartridge Description	Specification
Cartridge Automation	The following are general capabilities: ○ Up to three reagent injection steps. Each step enables mixing and incubation time for cell staining. ○ Automated sample reading. ○ Automated data analysis, which provides the user with analyzed data file, e.g. event detection record in .fcs and .csv file formats.

Appendix B – Symbols

Symbol	Used for	Symbol	Used for
	Manufacturer		TUV Mark
SN	Serial Number		Consult instructions for use
CE	CE Mark		Environmentally friendly use period. Actual number of years may vary by product. This symbol is typically orange in color.

Appendix C – Labels
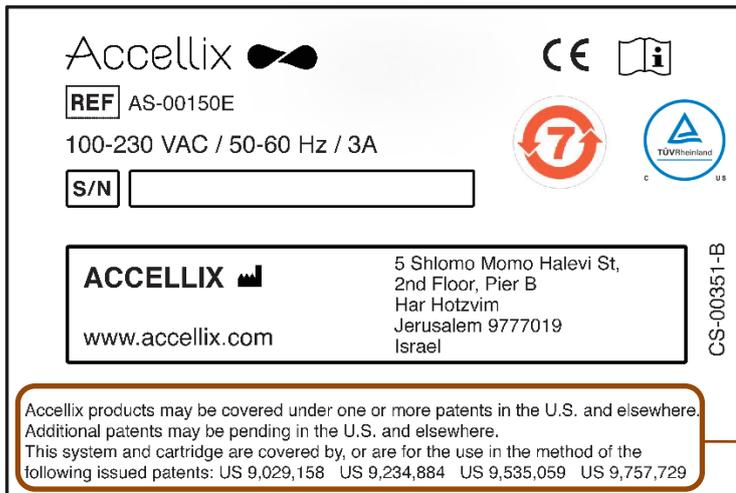
1. Accellix products may be covered under one or more patents in the U.S. and elsewhere. Additional patents may be pending in the U.S. and elsewhere. This system and cartridge are covered by, or are for the use in the method of the following issued patents: US 9,029,158 US 9,234,884 US 9,535,059 US 9,757,729

Appendix D – Safety Information

- Laser exposure — Do not open the Cartridge Access Door while the instrument is processing a sample, as this will cause the assay to be aborted. This is designed to prevent the user from being exposed to the laser while the laser is active.

- Cartridge- and assay-specific safety issues — Refer to the Technical Data Sheet included with assay kit.

- Cartridge disposal—Dispose of the cartridge as a biohazard in accordance with local regulations.

- Electrical safety— The instrument complies with the following standards:
  - IEC/EN61010-1: 2010

    UL61010-1 / CAN/CSA – C22.2 No. 61010-1-12

    Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
  - IEC/EN 61010-2-081: 2015 (ed.2)

    CAN/CSA-C22.2 No. 61010-2-081:15

    Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-081: Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes
  - EN61326 EMC emission and immunity requirements
  - FCC compliance statement: This instrument complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
    (1) This instrument may not cause harmful interference, and (2) this instrument must

accept any interference received, including interference that may cause undesired operation.

- o Per China MIIT Notice No.52 on regulation of micropower equipment:

  (1) The use of the equipment shall comply with the specific provisions and usage scenario, type and performance of the antenna adopted, and the method to control, adjust and switch the equipment in the "Catalogue of Micro-power Short-range Ratio Transmission Equipment and Technical Requirements";

  (2) It is not allowed to arbitrarily change the usage scenario or usage condition, expand the transmission frequency range, increase the transmission power (including additional installation of radio frequency power amplifier) or arbitrarily change the transmission antenna;

  (3) No harmful interference may be caused to any other legitimate radio station, and no protection against harmful interference may be required;

  (4) It shall withstand the interferences from industrial, scientific and medical (ISM) application devices radiating RF energy or interference from other legitimate radio stations;

  (5) If harmful interferences are caused to other legitimate radio stations, the use of radio transmission equipment shall be stopped immediately, and can only be continued after measures have been taken to eliminate the interference;

  (6) For the use of micro-power equipment in aircrafts, in military and civil radio stations established according to the laws & regulations and relevant regulations of the state, such as the radio observatories, meteorological radar stations, satellite earth stations (including measurement and control station, ranging station, receiving station and navigation station), in airports and other electromagnetic environmental protection areas, it is required to comply with the provisions for electromagnetic environmental protection as well as the regulations of competent authorities of relevant industries;

  (7) No remote controller is accessible to the area centering at the center point of runway and in 5000 m radius;

  (8) The environmental conditions of temperature and voltage in the use of micro-power equipment shall meet the operating environment and electrical requirements outlined in Appendix A – Technical Specifications.

Note: Protection provided by the equipment can be impaired if the instrument is used in a manner not specified by the manufacturer.

Appendix E – User Support & Manufacturer Contact Information

Accellix User Support	Accellix, Inc. 2385 Bering Drive San Jose, CA 95131, U.S.A. Telephone: +1 650.396.3035 E-mail: support@accellix.com

▲▲▲	Accellix, Ltd. 5 Shlomo Momo Halevi Street 2nd Floor, Pier B; Har Hotzvim P.O. Box 45409 Jerusalem 9777019, Israel Tel: +972-2-674-4433 Fax: +972-2-674-4455 E-mail: office@accellix.com