DeNovix®

QFX Fluorometer

User Guide

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1. Introduction

Product Technology

DeNovix QFX Fluorometers are compact, stand-alone instruments with a high-resolution touchscreen. EasyApps™ Software utilizes application specific icons along with a custom operating system to provide an intuitive, easy-to-use instrument for fluorescence measurements.

Key Features include:

- Stand-Alone Design, no-PC required

- Hi-Definition 7-inch Touchscreen Interface

- Simple, Intuitive EasyApps™ Software

- Four LED Excitation Options

- WiFi, Ethernet and USB connectivity

2. Set up and Safety

1. Remove all packing materials including the protective cover on the screen.

2. Plug the unit into a 100-240 VAC, 50-60/Hz receptacle using the grounded power supply (***CUI MPN: ETSA120330U-P5P-SZ, Transformer Dest Top 12V 40W, Lead free / RoHS Compliant)*** included with each unit.

3. For instruments with red LED power indicators, turn on the power switch located in the back of the instrument. For instruments with green LED power indicators, press and release the power switch.

   The Android-based operating system will boot up in less than a minute.

4. Use the **Shut Down** icon (accessed from within each app or on the Home screen) to do a soft power down. For instruments with green LED power indicators, toggle the power switch to restart the instrument.

Cautions

DO NOT REMOVE COVER
No operator serviceable components inside. Refer servicing to qualified personnel.

The QFX is designed for indoor use under the following conditions:

Temperature: 15˚ to 35˚ C
Humidity: 35 to 65 %

Use only the power supply provided with the instrument. Use of the instrument in any manner not specified by the manufacturer may impair the protection provided by the supplied power cord and power supply.

NE PAS OUVRIR L'APPAREIL.
Aucun composant réparable par un utilisateur est inclus. Confiez l'entretien à du personnel qualifié .
Le QFX est conçu pour une utilisation en intérieur dans les conditions suivantes :

Température : 15° à 35˚C

Humidité: ....35 à 65%

Utilisez uniquement le bloc d'alimentation inclus avec l'instrument. Utiliser l'appareil dans des conditions non spécifiées par le fabricant peut compromettre la protection offerte par le cable d'alimentation et le bloc d'alimentation fournis avec l'appareil.

この製品は、技術基準適合証明に関する条例等特定無線設備(MPT省令第37号または1981）の タイプによって認定に準拠しています。 この機器のカテゴリ：第2条、第1項のアイテム(19)　第2条第1項、項目(19)-2

VCCI (Class B) compliance statement for users in Japan:

This is a Class B product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

This equipment has been tested for radio frequency emissions and has been verified to meet CISPR 22.2 Class B.

Instrument Rear Panel

The QFX comes equipped with one Ethernet and three USB ports. The Ethernet feature is provided for internet connectivity only. The USB ports are used to facilitate data transfer to a FAT32 formatted USB storage device. In addition, the USB ports support the use of selected DYMO printers* and an Opticon OPI 3601 USB barcode reader. USB mouse and keyboard devices may also be used with the QFX.

Please refer to www.denovix for a list of supported Dymo printers.

3. Software Quick Guides

Software Icons

＋	**Add**	⠿	**Select All**	⠸	**Export**
🗑	**Delete**	⠿	**Deselect All**	≡	**Sort**
✏	**Edit**	🗐	**Copy**	ⓘ	**Info**
↩	**Undo**	📋	**Paste**	⏻	**Shut Down**

⋮ The **Overflow** (top action bar) is used to access secondary features such as Select Units, Screen Capture, User Guide and Exit.

Busy icons and progress bars are used to indicate the instrument is in the process of making a measurement. Please wait until the icon has disappeared before tapping the screen to perform additional actions.

The **USB Flash Drive Eject** icon appears in the bottom notification bar when a drive is detected. The software will automatically safely unmount the flash drive after a screen capture or a report is exported to the drive. Tap the icon to remove a flash drive when nothing was exported or saved.
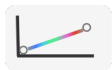
The **Quick Print** icon is only displayed on Report or Graph screens when a DYMO label printer is connected to the instrument.

Auto Export status icons are displayed at the top right of a Run screen. Ensure WiFi is connected prior to making a measurement.

Software Buttons

The fluorescence apps **Standards Measure** button is used to measure standards when building a standard curve.

The **Samples Measure** button is used to quantitate samples.

The fluorescence apps **Replicates On/Off** button is used to define if the standards curve enables one or up to three replicates.

The fluorescence apps **Basic Measure** button is used to make single measurements not being read from a standard curve.

Fields with **Drop-Down Menus** are indicated by black or white triangles located on the bottom right.

Fields with black underlines are editable by the user. Tapping on the field will enable a keyboard, a numeric keypad or a dialog box.

Application specific editor options can be accessed using the **List Add/Edit** button found to the right of some drop-down menus.

Options buttons are used for such purposes as change units or trend line analysis parameters in the fluorescence apps.

An **accept and return** to previous screen button is found in the lower right of some screens. All changes made to a selection are immediate.
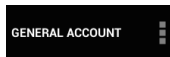
Software Navigation

	Apps are launched using **Home** screen icons. Swipe the Home page to the left for additional icons.
Run Report Graph	The app **Run**, **Report** and **Graph** screens are accessed either by the tabs on the top bar or by swiping the screens left or right.
GENERAL ACCOUNT	Use the **Current Account Tab** drop-down menu on the top action bar in the Run, Report and Graph screens to select a specific account within an app. Use the **Accounts** app to create and manage accounts.
⬅	The bottom bar **Back** button is used to navigate to the main level of the current app.
⌂	The bottom bar **Home** button is used to navigate to the Home screen without closing the app.
▭	The bottom bar **Recents** button is used to as a means of displaying recently used apps. Swipe the app to the left from the Recents list will close the app.
⌄	The bottom bar **Collapse** button is used in place of the Back button whenever a keyboard is enabled. Use this button to dismiss the keyboard.

Notification Bar

Information such as available updates, scheduled system backups reminders and WiFi connectivity status are located on the bottom action bar adjacent to the date and time display. Swipe the notification up for details. Tap outside the notification box to minimize the information.
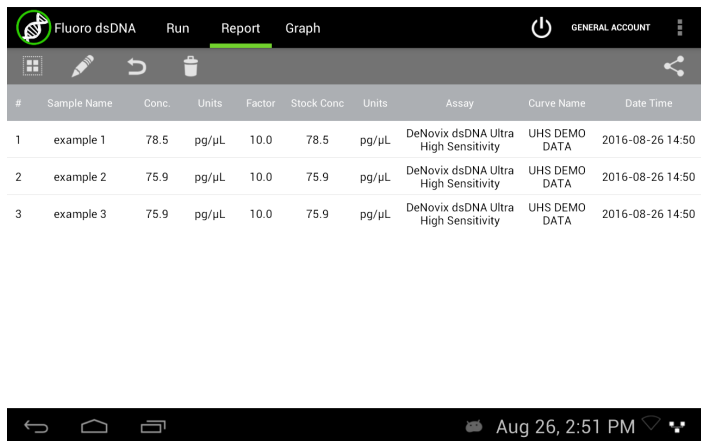
Top Bar Overflow Functions

Screen Capture	A .jpg may be exported as described in the chapter entitled "Screen Capture and Export" using this option.
Export Selected Samples	A .csv file of sample data may be may be exported as described in the chapter entitled "Screen Capture and Export"**.** Network printing is also enabled using this option.
Report Formats	Customized report export formats are configured using this option.
Archive Selected Samples	The **Archive** function exports data as a .csv file to a network folder or USB flash drive and ***permanently*** deletes it from the instrument.
Clear Samples	This function saves and then clears all current sample records from the Report and Graph screens.
User Guide	The **User Guide** may be accessed either from the Overflow icon within any app or by launching the User Guide app.
About	The **About** feature brings up an information box displaying the current app version number.
Exit	Use the **Exit** function to close an application.

4. Report and Graph Screens

The measurement apps generally use a three page structure consisting of the Run, Report and Graph screens. The various screens are accessed either by using the top tabs or by swiping the touch screen left or right.

The Run screens for each type of assay will be described in the specific app chapters.

Report Screen

- The Report screen list includes application specific data fields for each sample measured in the current measurement session.

- Tap rows to highlight and select data for export. The **Select All /UnSelect All** icons are used to quickly select or deselect all rows.

- The change will be applied to the current Report and Graph screen rows as well as to the sample information retrieved using the Data app.

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- Clear highlighted sample records from the both the Report and Graph screens using the **Delete** icon. The data is removed from the current report but is still available using the Data app.

- Highlighted sample data may be exported or printed using the top action bar Overflow **Screen Capture** or **Export Selected** functions. Additional information is provided in the chapter entitled "Screen Capture and Export".

Graph Screen
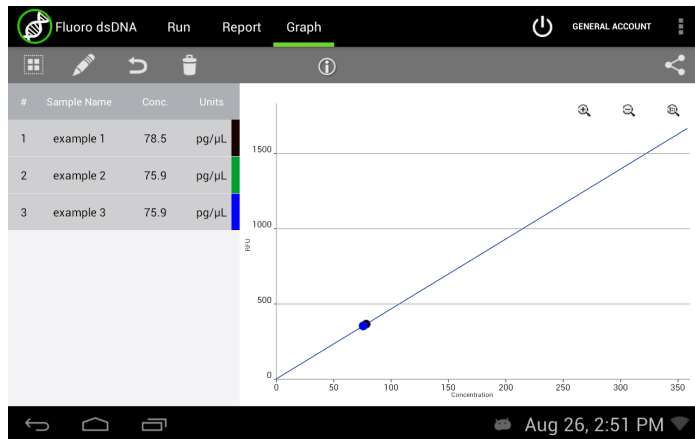
- Tap rows to highlight and select data to display the spectra. The **Select All / UnSelect All** icons are used to quickly select or deselect all rows.

- Up to 24 samples may be overlaid on the graph. The data will be presented as the concentration calculated from the standard curve trend line- not the sample tock concentration which takes dilution factors in consideration.

- Color blocks are used as a legend convention.

- Highlight a single row and then tap the **Edit** icon to add or modify a sample name. The change will be applied to the Report and Graph screen rows.

- Clear highlighted sample records from the both the Report and Graph screens using the **Delete** icon. The cleared data will be available using the Data app.

- Highlighted sample data may be exported or printed using the Overflow **Screen Capture** or **Export Selected** functions. The data will will exported as a .csv file . Additional information is provided in the chapter entitled "Screen Capture and Export".

5. Basic Operation

DeNovix Fluorometer software includes fluorescence EasyApps™ Software. The fluorescence app icons will appear on the Home screen.

The table below lists the four LEDs included in the QFX. Users must select the appropriate LED for the assay that they choose for quantification.

LEDs	Excitation Filter Range	Emission Filter Range
UV	361-389 nm	435-485 nm
Blue	442-497 nm	514-567 nm
Green	490-558 nm	565-650 nm
Red	613-662 nm	665-740 nm

Fluorescence Measurements

1. Launch the app of interest from the Home screen.

2. Insert a micro tube pre-filled with the fluorescent solution. Close the cover and tap **Measure**.

Notes:

- *Use clear thin-walled 0.5 mL plastic PCR tubes only*
- *Measure 200 µl volume samples.*

Screen Saver

- The backlight for the screen will automatically turn off after 10 minutes of inactivity. Simply tap anywhere on the screen to resume the last function.

- Although the screen is turned off for the screen saver mode, functions such as the Timer continue in the background. Always check that these apps are not in use in the background prior to turning off the instrument.

Mechanism Busy Indicator

- A progress bar will be displayed on the screen when the measurement mechanism is busy.

- Please do not lift the arm, push software buttons or turn the instrument off while a busy indicator is displayed.

Measurement Sessions

- New measurement sessions begin each time an app is accessed from a closed state or when the account is changed while the application is open.

- In addition, new sessions automatically begin when the number of sample records on the Report screen reaches 9999.

Best Practices

- Ensure all sample concentrations in the thin walled assay tubes fall within the limits of the assay or reagent kit for accurate results.

- Use 200 µL volumes in a clear thin walled PCR tube.

- Lower the cover before tapping the measure button.

- Avoid introducing air bubbles into the sample solution when mixing samples.

- Follow assay reagent manufacturers' recommendations regarding temperature, incubation time, and protection from ambient light.

- Follow assay reagent manufacturers' recommendations regarding suggested standard curve concentrations and data analysis.

- Ensure all samples and standards are treated identically in terms of incubation times and temperature.

- Minimize assay tube and solution temperature fluctuations as these may impact the accuracy of the assay. Samples at higher temperatures will generally have lower fluorescence.

- Do not label the side of an assay tube as this could interfere with the sample measurement.

6. Fluorescence: Standard Curve Method Apps

The EasyApps™ listed below are designed using the same basic architecture. Each app includes a choice of four excitation LEDs (UV, Blue, Red, Green) and a variety of assay. The end user is responsible for selecting the proper choice based on the analyte that will be used for quantification.

	Fluoro dsDNA	•DeNovix dsDNA Broad Range •DeNovix dsDNA High Sensitivity •DeNovix dsDNA Ultra High Sensitivity •Quant-iT™ PicoGreen •Quant-iT™ dsDNA HS •Quant-iT™ dsDNA BR	•Qubit™ dsDNA HS •Qubit™ dsDNA BR •Quantifluor dsDNA •Quantifluor One dsDNA
	Fluoro RNA	•DeNovix RNA Assay •Quant-iT™ RiboGreen •Quant-iT™ RNA HS •Quant-iT™ RNA BR •Qubit™ RNA HS	•Qubit™ RNA BR •Quantifluor RNA •Quant-iT™ microRNA •Qubit™ microRNA
	Fluoro ssDNA	•Quant-iT™ OliGreen •Qubit™ ssDNA •Quantifluor ssDNA	
	Fluoro Protein	•Quant-iT™ Protein •Qubit™ Protein	
	Fluoro Std Assays	•All entries to be defined by the user	

Quick Protocol

1. Launch the app from the **Home** screen.

2. Select the LED using the drop-down menu on the **Run** screen.

3. Generate a new curve:

    • Insert the standard (200 uL in a thin walled PCR tube) into the sample holder and lower the cover. Measure at least one replicate for a minimum of 2 standard concentrations

    • Alternatively, import a saved curve or list of sample concentrations

4. Tap the **Samples** radio button. Enter a sample name.

    • Optional: Enter a dilution factor to be applied to the reported concentration.

5. Quantitate a sample using the **Measure** button.

Refer to the manufacturer of the assay reagent for assay specific instructions.

Note:

•DeNovix and Qubit assays will have predefined standard concentrations and specified units.

Run Screen- Assay and Curve Selections

Excitation Source (LED) and Assay Selection

- Select an LED from the drop-down menu in the left panel. The user must choose the proper LED for the analyte in use (SW V3.52 and later).

- New assays may be entered using the List Add/Edit button.

- User defined assays may be used by all accounts but may be modified or deleted only by the account owner.

Curve Options

Generate New Curve

- Choosing this option will pop-up a dialog window used to enter the concentration values for the standards.

- Verify the concentrations of the standards for the LED / Assay chosen. The standard concentrations for all other assays are determined by the user at the time of the assay.

- Trend line analysis options and concentration units used may be changed using the advanced options button.

  - **Blank:** If selected, the first row in the standards table is used to measure a Blank.The average RFU value of the blank measurements will be subtracted from all standard and sample measurements. If the Blank is not selected, the initial concentration for preconfigured assays will be set to 0.00. This standard is typically the reagent/fluorophore solution without any nucleic acid or protein.

  - **Trend Line:** If selected, the trend line will be forced through the origin (0,0).

Use Previous Curve or Std Values

- Choosing this option will pop-up a dialog window with a radio button selector for saved standard curves and saved standard curve concentration lists.

- All modifications to a curve or list are effective **immediately.** It is important to save the selection with a new name prior to making any changes if you do not want to modify the original curve or standards list. Changes to a curve do not affect previously measured samples.

- Although all saved lists and saved curves are available for use by all accounts, only the account holder may modify the selection.

Run Screen- Standard Curve View
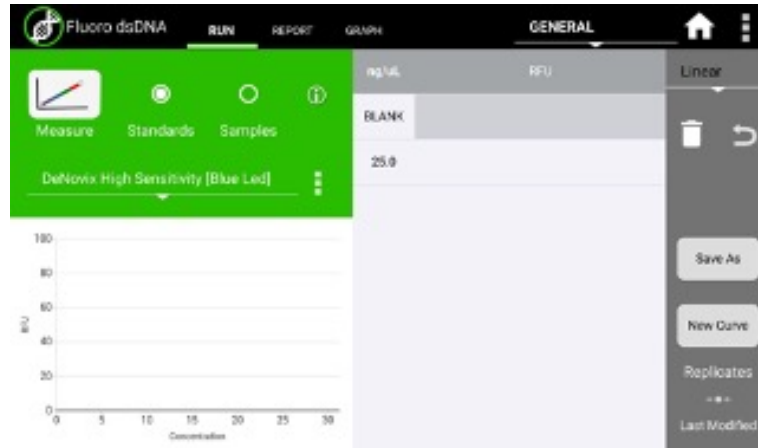
- The **Stds** button will pop-up the Edit Concentrations for Standard Curve window.

- The **Delete and Undo** icons are used to manage the RFU values within the table.

- The **Save** button will pop-up the Save Values window. Either concentration values or concentration values with the associated RFU values may be saved.

- The **New Curve** button is used to generate a new curve or load a previously saved curve. All sample data generated using the Samples radio button will be automatically saved and accessible using the Data app.

- The **Replicates** arrow button enables the use of up to three replicate measurements per standard concentration. The average of the replicates will be used to generate the trend line.

Run Screen- Sample Results View
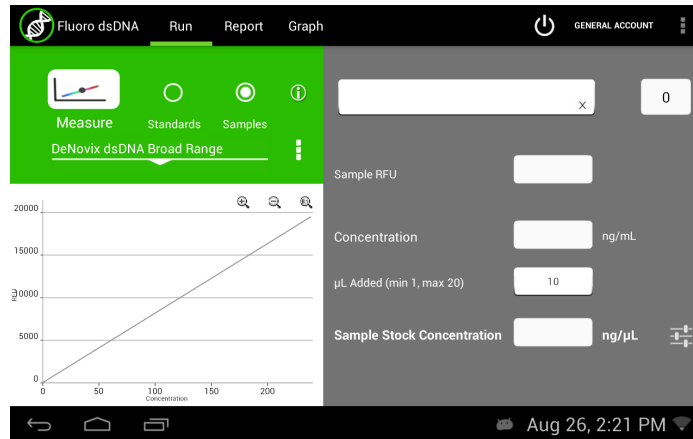
- Use the **Samples** radio button to display the measurement results view.

- The samples **Measure** button will be disabled until one replicate of at least two standards are measured using the standard curve view.

- The **Concentration from Curve** results are calculated directly from the standard curve trend line. Results are reported in terms of the units used to derive the trend line.

- The **Optional Dilution Factor** (or the **µl Added** value for Qubit™ assays) will be applied as a multiplier to the Concentration from Curve value and the result reported in the Sample Stock Concentration field.

- The **Sample Stock Concentration** results are reported in terms of the units selected by the user. The value saved in Report will be displayed in terms of the units in use at the time of the measurement.

New Standard Curve Assays/Methods

Each new method requires a unique name. In addition, the following parameters must be defined:

Excitation Source

- Use LED Radio buttons to select the excitation source.

- The LED Wizard may be used to determine a compatible excitation source if not known. The software will make a measurement using each of the four excitation sources and will report the associated RFU in the color-coded boxes

- Some fluorophores do not exhibit significant fluorescence unless bound to a protein or nucleic acid. It may be necessary to set up an assay reaction to best use the LED Wizard.

- The standard curve assay methods use one excitation source to determine the concentration of a sample based upon the RFU measured using the corresponding emission filter set.

Advanced Options

- Use the **Advanced Option** buttons to set both the Trend Line/Blank selections as well as the standard curve units.

Although all accounts may use any saved method, only the method account holder or an administrator may modify or delete the new method.

7. Basic Fluorometer App

 Basic Fluorometer

This app enables the QFX instrument to be used as a versatile fluorometer for applications such as dye QC checks and assay development. The app is especially useful for fluorophores with significant Stoke shifts as it allows the user to excite a sample with one LED and get RFU results from multiple emission channels.

Quick Protocol

1. Launch the app from the **Home** screen.

2. Select an excitation LED using the radio buttons.

3. Insert the standard (200 μL in a thin-walled PCR tube) into the FX mode sample holder.

4. Optional: Create and Save a used defined method (LED selection and user defined assay name).

5. Optional: Enter a sample name.

6. Tap the **Measure** button.
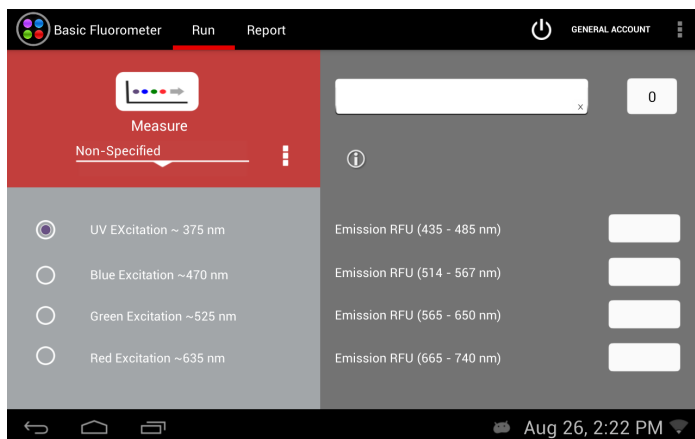
Excitation Selection and Emission Results

- Select an excitation source (LED) or LED plus fluorophore combination.

- The selected LED is the **only** excitation source used during a measurement. However, the emission RFU will be collected for each longer wavelength emission filter set.

    - For example, if the blue LED is selected, the the emission results for the blue, green and red channels will be reported. If the green LED is selected, only the green and red channel results will be reported.

- New fluorophores may be entered using the List Add/Edit button.

    - The Add button will pop-up a window that includes a LED Wizard. Tapping the Wizard button will result in the sample being excited by each LED and the RFU measured by the corresponding detector. The LED that resulted in the largest RFU at its detector will automatically be chosen as the LED for the method.

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8. Data Export and Print Options

Export Options

The data associated with highlighted samples on a Report or Graph screen may be exported via email, sent to a network folder or saved to a FAT32 formatted USB flash drive as .csv files.

- Data may be automatically exported to a network folder after every measurement. Refer to the "Network Folder Set-up" section for more information.

- To open an exported .csv file on a computer, the DeNovix instrument and the computer must **both** be set to use either period or comma number formats. The QFX number format is determined by the language selected using the Settings app.

Export Formats

Standard Formats

- The default .csv file format for each absorbance measurement app includes all absorbance vs wavelength data for the app specific measurement wavelength range as well as the calculated data displayed on the app Report screen.

Custom Formats

- User specific formats may be defined using the **Export Formats** option accessed from the Report screen Overflow menu.

- The format used when exporting results is selected at the time of the export. Accounts other than the General Account may set a user-defined format as the default selection using the Accounts app.

Defining a New Format:

- Provide a title for the format.

- Hold the arrow icon and drag a column up or down to change the order of the columns.

- Touch on the column name and swipe it left or right to exclude or include it in the exported report.

- Tap on the input field to change the name of a column header in the exported report.

Graph Screen Exports

- Selected sample results exported from an absorbance app Graph screen follow the same format as when exported for the Report screen. Graphs are not exported as part of the .csv file.

- Use the Screen Capture option to export the current graph via email or to save the .jpg image to a network folder or a FAT32 formatted USB flash.

Export Via Email

- Screen captures as well as data .csv files may be exported via email.

- Use the Account app Overflow **Address Book** function to save frequently used recipient email addresses.

- It is recommended that a new, dedicated POP3 Outlook account be used for all outgoing email from the QFX. This type of account works very well with the instrument's operating system and prevents personal incoming email from being stored on the unit.

Email Set-up

1. Ensure that the instrument is connected to WiFi or Ethernet.

2. Swipe the Home screen to the left to navigate to the second page, launch the Email app and follow the prompts using the Manual setup option.

3. Input Incoming Server Information:
   - Select the **POP3** option on the Account Types screen. Do not use an IMAP account as messages from IMAP accounts could occupy a significant amount of the instrument's memory.

4. Set the inbox checking frequency to "Never" on the Account Options screen. The QFX email should be used only to export data and screen captures.

5. Input Outgoing Server Information:
   - Use settings appropriate for the lab email server.

6. Enter a name to display on outgoing messages.

Refer to your local IT support group if additional assistance is required.

Export to a Network Folder

- Screen captures, data report .csv files, as well as instrument backups and data archive files may be sent to a selected network folder.

- The two supported transfer options include Server Message Block (SMB) and File Transfer Protocol (FTP).

- Use the following apps to manage network folder options on the QFX:

Settings App

- Permission to setup a network folder for the General Account as well as standard user accounts are enabled or disabled by an administrator using the Permissions option in the Settings app. "Enabled" is the default selection.

Accounts App

- Network folder paths are defined and saved on a per user account basis from the Accounts app. The primary Administrator network folders are used only for the Backup and Restore function in the Settings app.

Network Set-up

1. Contact your local IT group to confirm that you have access to a local server or FTP site. Ensure that the instrument is connected to WiFi or Ethernet.

2. Launch the **Accounts** app and select a user account.

3. Use the top drop-down menu in the right pane to select the **Add New Network Folder** function.

4. Use the **List Add/Edit** button to add a network folder to the drop-down menu.

5. Select either the SMB or FTP option.

6. Enter a **nickname** for the network path. This is the name displayed in all drop-down menus referencing the network folder.

7. Enter the server computer's **host name.** Contact your local IT group for additional information.

8. Select log-in option. Contact your local IT group to request log-in credentials.

   - **Log in:** Enter the network folder username and password required to access the selected network folder.

- **Anonymous:** No user name or password required.

- **File (SMB only):** Upload a configuration file (file extension .prp) from a USB device. Note: If a username or password is entered that is different from information contained in the config file, the manually typed information will be used in validating the path access.Refer to http://jcifs.samba.org/src/docs/api/overview-summary.html#scp for additional guidance.

9. Use the **Browse** button to locate and select a specific folder path.

10. Use the **Auto Report** checkbox to enable automatic export of sample data after every measurement.

USB

- Screen captures as well as data .csv files may be saved to a FAT32 formatted USB flash drive.

- The **USB Flash Drive Eject** icon appears in the bottom notification bar when a drive is detected. The software will automatically safely unmount the flash drive after anything is written to the drive. If not removed, the software will automatically remount the flash drive when another write operation is performed.

  - Please wait for the "OK to remove" toast message to appear before removing the drive.Tap the icon to safely remove a flash drive when nothing was exported or saved. Failure to follow these instructions may result in the flash drive becoming unrecognizable to the instrument.

- There are three USB ports on the back of the instrument although only one storage device is recognized at a time. The two additional ports may be used for DYMO printers and barcode readers.

Auto Export Icon

When the auto export feature is selected, a status icon will appear at the top right of the screen after the first measurement.

Export in Progress   Export Completed   Export Failure

- Automatic export of every sample measurement to a network folder is enabled on a per user account basis.

- The auto export feature may only be selected for one saved network folder per user account.

- Automatic exports will be stored in a single file per app type per user account per day.

- When selected, the auto export will apply to all measurement apps used by the applicable account.

  Note: All sample data is saved to the instrument even if automatic exports fail due to server connectivity issues.

Troubleshooting Tips

- Confirm that there is WiFi or Ethernet connectivity. Use the Browser app on the second page of the Home screen to confirm connectivity or check the connectivity status icon on the right of the bottom navigation bar.

- Confirm that the log in credentials are valid for the network folder option selected and that the hostname is correct.

- For internet connectivity issues, network folder access failures and all other server related issues, contact your local IT support group.

Print Options

The QFX software supports printing to networked printers or to selected DYMO printers*. All Dymo print-outs are in black and white.

*Please refer to www.denovix for a list of supported Dymo printers.

WiFi and Networked Printers

Screen shots as well as selected sample data and graphs may be printed to both Wifi enabled and networked printers.

- Use the Overflow menu to select either Screen Capture or Export Selected Samples to bring up a dialog box with Network Printer as a radio button option.

- Selecting this option will display a preview of the print-out along with many customizable options.

- To select a printer, ensure that the instrument has WiFi or Ethernet connection and then tap the first item listed under Printer Options. This will bring up a list of available printers. If no printers are listed, tap the Network Printers icon in the left pane to search for nearby printers.

The current software supports approximately 90% of printers on the market. DeNovix will continue to add new drivers to accommodate as many new printers as possible in future software updates but cannot guarantee compatibility with all printers.

Please contact DeNovix or your local distributor for a list of recommended printers if your current printer is not compatible with the software.

DYMO Printers

- The software enables the use of three DYMO paper or label sizes:

  - 4x6 labels (DYMO 4XL only) and 2.5 inch paper rolls are used to print screen captures and selected sample results from the Report or Graph screens.

    o   Report and Graph print column formats will be as shown on the instrument display.

  - 1 x 0.5 inch labels are used to print sample names, stock sample concentrations, units and the date on individual labels suitable for standard microfuge tubes.

  - For the basic fluorometer app- the label will include the excitation LED and the associated channel RFU value.

- A Quick Print button will be displayed on the Run, Report and Graph screens when a DYMO printer is detected. Label sizes may be selected by tapping the printer icon displayed next to the date and time in the bottom notification bar.

- Although sample names may include up to 48 characters, the DYMO printed label will print 2 rows of characters per sample name. The exact number of sample name characters may vary depending on the language in use.

9. Utility Apps and Functions

Accounts   Data   Settings   Updater

Accounts App

User accounts manage default settings within specific apps as well as saved sample and dye types, wavelength lists and user methods. Accounts are also used as a means of segregating data when performing searches in the Data app. The **Add New Network Folder** function is accessed from a drop-down menu on the right side of the screen. The **Address Book** function accessed from the Overflow menu in this app allows users to save frequently used recipient email addresses for easy reference.

System Accounts

There are two preconfigured system accounts built into the software:

- **Primary Administrator**
  - This account is used to manage instrument settings. It is not used within the measurement applications.
  - The primary administrator account is not initially password protected. A password may be applied at any time. Contact DeNovix if help is required to reset the primary administrator account password.

- **General Account**
  - This account is used as the default selection for all apps each time an app is opened. This account may not be password protected or deleted.

User Added Accounts

All added administrator or standard user accounts may be password protected.

- **Administrator Accounts**

  - An administrator level account may only be created by another administrator.

  - Administrator accounts may modify or delete user entries of any sort created from within any account.

  - Administrators may change the password for any account as well as delete any account.

- **Standard Accounts**

  - Any user may add a standard level account.

  - Standard accounts may only modify or delete sample or dye types, wavelength lists or user methods created from within their account.

If an account is deleted, all associated sample and dye types, wavelength lists and user methods are still available for general use unless deleted by an administrator.

Contact the holder of an administrator account if a standard user account password is forgotten. Contact DeNovix customer support or your local distributor if the Primary Administrator password is forgotten. Please have the serial number of the instrument available when requesting help for the Primary Administrator password reset.

App Default Selections

Some application specific default settings may be defined on a per account basis. Launch the Accounts app from the Home screen and then use the drop-down menus to select the account, the app and the setting of interest.

Note: The default selections for the General Account may not be modified.

Data App

This app allows the user to search for past data using either a Advanced Search or Quick Search option. Data can then be added to the Report and Graph screens for review and export. In addition, data may be archived from the Search Screen.
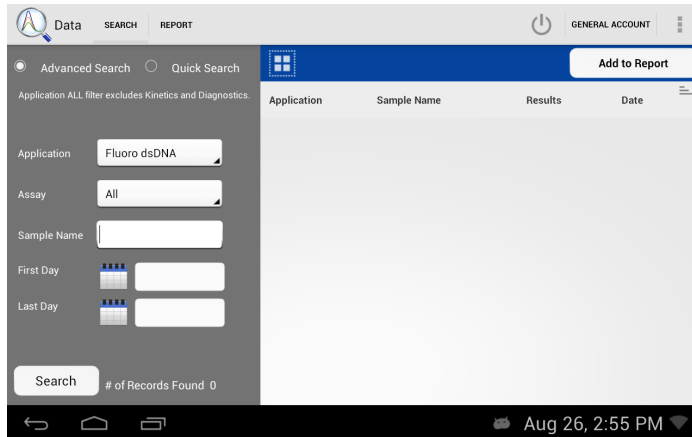
Search Options

- Data is automatically filtered based upon the Account selected using the tab on the top action bar.

- The **Advanced Search** allows multiple filters to be applied in a single search. The **Quick Search** option enables the user to filter by a single criteria in addition to the automatic Account filter.

- Diagnostics results are not accessible using Quick Search.

- Once the filter criteria have been selected, tap the **Search** button at the bottom of the screen. Tap any column header to sort the results list.

- Highlight the sample(s) of interest and tap the **Add to Report** button to include the samples on the Report and Graph screens. Blank measurements may be included in the list but will not provide any absorbance data.

- All data must be from the same app type for the samples to be added to the Report or Graph screens.

    - Note: The Data app does not include a Graph screen for fluorescence apps.

Export vs Archive

- All data is automatically saved to the QFX onboard computer database at the time of measurement.

    - The Auto Export feature is available when a network folder is set-up using the Accounts app.

- The **Export Selected Samples** function available from the Report and Graph screen overflow menus creates a .csv that can be emailed, sent to a network folder or saved to a FAT32 formatted USB flash drive.

    - When the export function is used, the data is **not** deleted from the database and can be accessed using the Data app.

- The **Archive Selected Samples** function available from the Run and Report screen overflow menus creates a .csv file with sample data that can be exported to a folder entitled ds11 on a FAT32 formatted USB flash drive or saved to a network folder.

  - When the archive function is used, the data is ***permanently*** deleted from the instrument database and cannot be restored to the instrument.

- The archiving privilege for standard accounts is enabled or disabled using the Settings app. When disabled, only administrative accounts may archive data.

- The storage capability of the QFX is sufficient for several years of data for a lab with average use. Therefore, it is recommended that the archiving function be used only as an infrequent method of deleting old data from the QFX database. Although archiving a large amount of data may take a considerable amount of time, the archive process continues to work even when the interface goes to sleep after 10 minutes of no user activity. Touch the screen to wake-up the user interface and update the progress message.

- Use the **Cancel** button to stop the archive button. Samples already copied up to the stop point may be deleted from the instrument at the user's discretion.

Settings App

The Settings app may be found on the second Home screen page. Only administrator accounts may access and change settings.

The app provides access to the following functions:

Backup and Restore

- The backup process exports a copy of all user-defined app settings, methods, dyes, sample types, email addresses, shared folder paths, user accounts and sample results to either a USB flash drive or a network folder.

- Backup files include a DeNovix specific extension and may not be opened on a computer. The files may be restored back onto the QFX at any time.

- Automatic backup reminders may be enabled using the checkbox on the Backup screen.

- The restore function is used to recover user defined app settings, methods, dyes, sample types, email addresses, shared folder paths, user accounts and all sample results saved at the time of the backup. There are two options:

  - **Recover All:** Restores user defined app settings, user entered methods, user added dyes and sample types, email addresses, shared folder paths and saved user accounts as well as previous sample results. All new methods, sample and dye types, emails addresses, network folders, user app settings and data results accumulated since the time of the back-up will be overwritten during the restore process.

  - **Recover User Info Only**: Use this option to recover settings, methods, dyes, sample types, email addresses, shared folder paths and user accounts. This option will not restore sample data or overwrite new data.

Date/Time

- Select manual or automatic date and time options.

Language

- Although the Android system provides translations for some routine functions in many languages, the majority of the app specific text will be available in a limited number of language options.

- The QFX number format is determined by the language selected.

- Exit all apps before changing languages.

Network Information

- The WiFi and Ethernet media access control addresses can be found under this setting.

Permissions

- This selection is used to enable the following options:

  Archive: Use this selection to enable or disable all standard accounts, including the General Account, to archive (delete) data from the instrument. Refer to the Export vs Archive section for additional information regarding archiving.

  Automatic Updates: Use this selection to enable or disable automatic updates of the software.

  Network Folder: Use this selection to enable or disable the general account and/or standard user accounts to set-up network folders for data export/archive and system backups.

Sound

- Volume controls are available for media and timer alarms.

Storage

- Displays storage statistics.

WiFi

To enter static IP addresses :
1. Ensure the WiFi is on. Select **WiFi** from the Settings list.
2. Tap the **Add** icon on the right side of the top action bar.
3. Dismiss the keyboard using the chevron on the bottom action bar.
4. Select the **Show Advanced Options** checkbox.
5. Select **Static** using the IP settings drop-down.
6. Enter the appropriate information and tap **Save.**

Ethernet

To enter static IP addresses :
1. Ensure the Ethernet cable is connected. Select **Ethernet** from the Settings list.
2. Tap the name of the connection. Use the drop-down menu to select **Static**. Enter the appropriate information and tap **Apply**.

Note: WiFi will take precedence over the Ethernet when both are connected.

Contact your local IT department if additional help setting up WiFi or Ethernet static IP addresses is needed.

Updater App

This app is used to update all apps to the most current available versions. The latest updates are available at www.denovix.com. For instruments without internet access, a zip file with the latest updates may be downloaded from the website onto a FAT32 formatted USB flash drive.

Procedure

If the QFX is connected to the internet via WiFi or Ethernet proceed to step 3.

1. Download the required package from the www.denovix.com website directly to the root level of the flash drive. Do not unzip the file folders.

2. Shut down all open apps.

3. Swipe to page 2 of the Home screen and launch the Updater app.

4. Click **OK** if a message is displayed that indicates new firmware is required. Do not turn off the power to the instrument during the 10- to 15 second firmware update process.

Note: Some installed apps are used for important background system functions and will not be visible on the Home screen.

10.Lab Tool Apps

ATCG Calculators   Timer

Calculator App

Three calculators are included within the app. Use the tabs in the top action bar to navigate between the options.

Oligo Calculator

This calculator analyzes a user-inputed ssDNA or RNA sequence of interest.

- Outputs include:

    - **Length**

    - **Molecular Weight (g/mol)**

    - **GC Content**

    - **Mass Extinction Coefficient (µg/OD @260 nm):** This result may be copied and pasted into the Factor Input field used for nucleic acid concentration calculations in both the ssDNA and the Microarray apps.

    - **Melting Temp:** For sequences up to 13 nucleotides, the equation used is $Tm = (wA+xT) * 2 + (yG+zC) * 4$ where w,x,y,z are the number of the bases A,T,G,C in the sequence. For sequences longer than 13 nucleotides, the equation used is $Tm = 64.9 + 41*(yG+zC-16.4)/(wA+xT+yG+zC)$. Both equations assume that the annealing occurs under the standard conditions of 50 nM primer, 50 mM Na+, and pH 7.0.

Scientific Calculator

Use this calculator for standard mathematical and scientific functions.

Dilution Calculator

This calculator is a useful tool to calculate how much of a stock solution should be added to a buffer solution to result in a final specified solution concentration.

- Both molar and mass units are available. However, conversions between the two types of units are not enabled.

Timer App

This app is a lab tool that allows a user to set two independent timers.

- At the end of a specified period, an alarm will sound for a maximum of 90 seconds.

- Push the **Off** button to silence the alarm.

- The alarm can be acknowledged via the notification bar or by going back to the Timer app.

- The Timer will work in the background while other measurement apps are in use as well as when the screen is in the dark screen saver mode.

11. Maintenance

Guidelines

- Use only a dry, soft, lint-free cloth to clean the front screen.

- Do not use a spray bottle to apply water or any other solutions onto any surface of the instrument as the liquid may damage internal components.

ScreenLocker App

Launch the ScreenLocker app from page 2 of the Home screen prior to cleaning the touch screen. This will disable swiping motions from activating other software activities. Tap the Droid icon three times to unlock the screen.

Fluorescence Mode Holder Cleaning

The tube holders may be cleaned of excess dust using canned air or a damp (not wet) lint free cotton swab.

- Do not allow any liquid to drip into the holders as it may damage the internal components of the instrument.

Customer Support

Contact DeNovix Customer Support at 1-302-442-6911 or info@denovix.com if additional help is required. Please include the serial number of your instrument when contacting Customer Support by email.

Outside of the US, please contact your local distributor for assistance.

12. Diagnostics

Fluorometer Diagnostics

The Fluor Diagnostics app is used to confirm that the LED excitation sources and detectors are functioning properly.

Procedure

1. Ensure sample measurement tube holder is empty and the lid is closed

2. Launch the **FX Diagnostics** app and push the **Start** button.

    - The software tests that each LED is firing and each detector is functioning properly. Results will be reported as Pass/Fail.

Technical Support

Contact DeNovix Customer Support if additional help is required. For US customers, please email the results directly to info@denovix.com using the Diagnostics app Overflow **Tech Support** function. Include your name, phone number, institute/company, and return email address. Please note responses will not be sent directly to the instrument email account.

The Tech Support email includes encrypted files that can only be opened by DeNovix technical support team.

Outside of the US, please contact your local distributor for assistance.

13. Troubleshooting

Quick Help

Most issues concerning *accuracy and reproducibility* are sample or technique related and are resolved by following the suggestions below:

- Ensure all solutions are homogenous and well-mixed prior to sampling.

- In the case of fluorescence quantitation assays, ensure sample concentrations fall within the reagent kit limits as described by the reagent manufacturer.

Fluorescence Mode

- Use 200 µL volumes in a clear thin walled PCR tube

- Avoid introducing air bubbles into the sample solution when mixing samples.

- Ensure all sample concentrations in the thin walled assay tubes fall within the limits of the assay or reagent kit for accurate results.

- Follow assay reagent manufacturers' recommendations regarding temperature, incubation time, and protection from ambient light.

- Follow assay reagent manufacturers' recommendations regarding suggested standard curve concentrations and data analysis.

- Confirm that the correct LED excitation source was used.

- Confirm that standard concentrations and dilutions were performed correctly.

- Confirm that the correct concentration units for the standard curve and the unknown samples were used to calculate the stock concentrations.

- Ensure that the correct optional dilution factor (or uL added in the case of Qubit® assays) is entered into the appropriate Run screen field ***before*** a measurement is made.

- Ensure all samples and standards are treated identically in terms of incubation times and temperature.

- Minimize assay tube and solution temperature fluctuations as these may impact the accuracy of the measurement.

- Do not label the side of an assay tube as this could interfere with the sample measurement.

Additional troubleshooting resources (technical notes and FAQs) are available at www.denovix.com.

Software Errors

Pop-up messages will provide guidance for software-based errors or invalid user actions. In most cases, simply relaunching the app will allow the user to continue to make measurements. Update the software using the **Updater** app if experiencing a reoccurring software error.

Contact DeNovix Customer Support 302-442-6911 or info@denovix.com if additional help is required. Please include the serial number of your instrument when contacting Customer Support by email. The serial number may be found on the bottom of the instrument.

Outside of the US, please contact your local distributor for assistance.

Printer and Barcode Scanner

The QFX is compatible with selected DYMO printers* and Opticon OPI 3601 USB barcode scanners. For accessory product troubleshooting and warranty information, please contact the manufacturer of the product. DeNovix support is limited to the specific use of the product with a QFX instrument.

*Please refer to www.denovix for a list of supported Dymo printers.

14. Customer Support

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Wilmington, DE USA 19810
302-442-6911
info@denovix.com
www.denovix.com

Please include the serial number of your instrument when contacting Customer Support by email. If sending Customer Support a Screen Capture or a report .csv file using the QFX email feature, include your name, institute/company, phone number and return email address. **Please note responses will not be sent directly to the email account used by the instrument.** Outside of the US, please contact your local distributor for assistance.

Warranty

All product(s) and accessories sold by DeNovix Inc. are under warranty against manufacturing defects in parts.

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