

USER GUIDE

# DeNIRO<sup>©</sup>

## NIR Fluorometer

# DeNIRO<sup>©</sup> NIR Fluorometer

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Revision 1.0

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## About this guide

### Overview

This user guide describes how to operate the DeNIRO® NIR Fluorometer.

### User documentation

The guides listed below are available with the DeNIRO® NIR Fluorometer.

Guide	Pub. no.
<i>DeNIRO® NIR Fluorometer User Guide</i>	DeNIRO_UG_2017
<i>DeNIRO® NIR Fluorometer Quick Reference Card (QRC)</i>	DeNIRO_QRC_2017

For more information go to [detactdiagnostics.com/deniro](http://detactdiagnostics.com/deniro)

### Text and keyboard conventions

Text and keyboard conventions used in the *DeNIRO® NIR Fluorometer User Guide* are listed below. For safety alert words and symbols used in Detact Diagnostics user documentation, see page 4.

Convention	Use
<b>Bold</b>	<b>Bold</b> text indicates user action. For example: Click <b>Run</b> .
▶	Right arrow symbol (▶) indicates a menu choice, and separates successive commands you execute or select from a drop-down or shortcut menu. For example: Select <b>Settings ▶ Instrument settings</b> .

### User attention words

Two user attention words appear in Detact Diagnostics user documentation. Each word implies a particular level of observation or action as described below.



**Note:** Provides information that may be of interest or help but is not critical to the use of the product.



**IMPORTANT!** Provides information that is necessary for proper instrument operation, accurate installation, or safe use of a chemical.

**Safety alert words** Four safety alert words appear in Detact Diagnostics user documentation at points in the document where you need to be aware of relevant hazards. Each alert word—**IMPORTANT, CAUTION, WARNING, DANGER**—implies a particular level of observation or action, as defined below:



**IMPORTANT!** – Provides information that is necessary for proper instrument operation, accurate installation, or safe use of a chemical.

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**CAUTION!** – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

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**WARNING!** – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

---



**DANGER!** – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

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Except for **IMPORTANT!** safety alerts, each safety alert word in a Detact Diagnostics document appears with an open triangle figure that contains a hazard symbol. These hazard symbols are identical to the hazard symbols that are affixed to Detact Diagnostics instruments (see “**Safety symbols**” in Appendix C).

**SDSs**

The Safety Data Sheets (SDSs) for any chemicals supplied by Detact Diagnostics are available upon request. For instructions on obtaining SDSs, see “**Safety Data Sheets (SDS)**”.



**IMPORTANT!** For the SDSs of chemicals not distributed by Detact Diagnostics contact the chemical manufacturer.

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# 1. Product information

## Product contents

The DeNIRO® NIR Fluorometer is shipped with the components listed below:

Component	Quantity
DeNIRO® NIR Fluorometer	1 each
Universal Power Cord with 4 adaptor plugs (for U.S./E.U./U.K./Australia)	1 each
USB drive (includes the instruction manual)	1 each
DeNIRO® NIR Fluorometer USB cable	1 each
DeNIRO® NIR Fluorometer Quick Reference Card (QRC)	1 each
Certificate of Conformity (COC)	1 each
DeNIRO® NIR Fluorometer Screen cleaning cloth	1 each

The complete instruction manual is also available on our website at [detactdiagnostics.com/deniro](http://detactdiagnostics.com/deniro)

See page 6 for the description and specifications of the DeNIRO® NIR Fluorometer.

### Upon receiving the instrument

Examine the instrument carefully for damage incurred during transit. Ensure that all parts of the instrument, including the accessories listed above, are included with the product. Damage claims must be filed with the carrier; the warranty does not cover in-transit damage.

See page 9 for instructions on setting up the DeNIRO® NIR Fluorometer.

### Registering your instrument

Visit [detactdiagnostics.com/deniro](http://detactdiagnostics.com/deniro) to register your instrument. You will be asked to supply the serial number, your name, and your contact details. Registering your instrument ensures that you will receive notifications of software upgrades and information on new assays for use with the DeNIRO® NIR Fluorometer.

## Product description

### DeNIRO<sup>®</sup> NIR Fluorometer

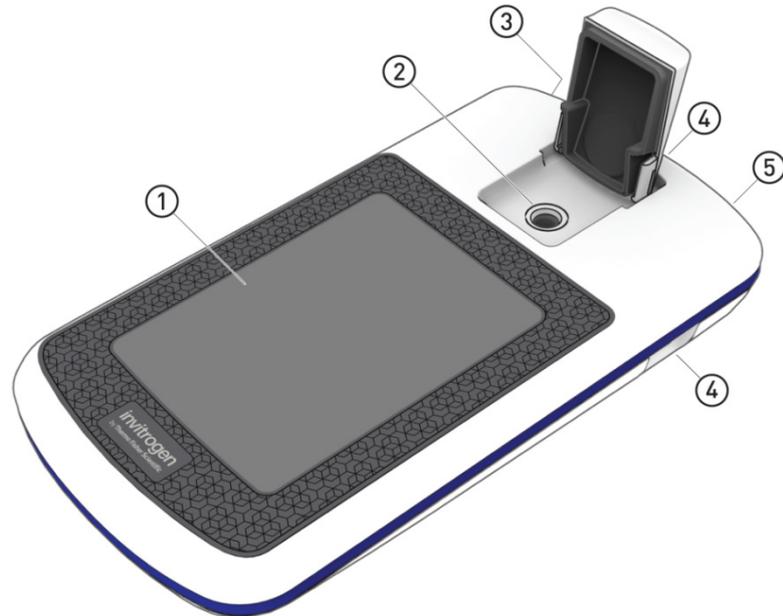
The Detact Diagnostics Near Infra Red Fluorometer (DeNIRO<sup>®</sup> NIR Fluorometer) measures bacterial and/or enzymatic activity using Detact Diagnostics BactoTact<sup>®</sup> and EnzoTact<sup>®</sup> assays. The Relative Fluorescence Units (RFU), emitted by the Detact Diagnostics assays after contact with the target bacteria/enzymes, correspond with a concentration of these bacteria/enzymes according to the diagram found in the assay product Directions for Use (DFU).

### Features

- Fast and highly accurate quantitation of bacteria and / or enzymatic activity in less than 5 seconds per sample.
- High levels of accuracy even with very dilute samples.
- Use of Infra Red minimizes the effects of contaminants in the sample.
- Stores results from up to 1000 samples.
- Large, state-of-the-art color touch screen for easy workflow navigation.
- Saves sample data as a.CSV (comma separated value) file.
- Exports data to a USB drive or directly to your computer via a USB cable.
- Allows easy definition and saving of assay preferences.
- Instrument user interface can be personalized to show only the frequently used assays and to display in the language of your choice including English, French, Spanish, Italian, German, simplified Chinese and Japanese. (Available Q2 2018)

## Instrument exterior components

### Top view



### Back view



- ① **Touchscreen** is the user interface containing the controls for all the functions needed and displays data from the assays.
- ② **Sample chamber** is used to load the assay tube containing the sample into the fluorometer for analysis.
- ③ **USB cable port (type mini-B)** allows you to transfer your data directly to your computer using the USB cable supplied with the instrument or any other similar USB cable.
- ④ **USB drive ports (Type A)** allow you to transfer and save data to your computer using the USB flash drive supplied with the instrument (or any other similar USB drive) for record keeping and printing purposes.
- ⑤ **Power inlet** connects the DeNIRO© NIR Fluorometer to an electrical outlet using the supplied power cord and the appropriate plug, based on the electrical outlet configuration in your country.

## Product specifications

Physical characteristics	<b>Instrument type:</b>	Benchtop Near Infra Red Fluorometer
	<b>Instrument dimensions:</b>	5.4" (w) × 10" (l) × 2.2" (h) (13.6 cm × 25 cm × 5.5 cm); rectangular shape
	<b>Weight:</b>	26.2 oz (743 g)
	<b>Operating power:</b>	100–240 VAC, 1.0 A
	<b>Frequency:</b>	50/60 Hz
	<b>Electrical input:</b>	12 VDC, 2.5 A
	<b>Installation site:</b>	Indoor use only
	<b>Operating temperature:</b>	10–40°C
	<b>Operating humidity:</b>	20–80% (non-condensing)
	Technical specifications	<b>Dynamic range:</b>
<b>Processing time:</b>		< 5 seconds/sample
<b>Light source: Excitation filter: Emission filter:</b>		NIR LED (max ~760 nm) Near IR 750-769 nm
<b>Detectors:</b>		Near IR 800-1250 nm
<b>Calibration type:</b>		Photodiodes; measurement capability from 300-1000 nm 1 point blank
<b>Tube type:</b>		0.5-mL Eppendorf (polypropylene) tubes
<b>Warm-up time:</b>		< 35 seconds
USB drive	<b>Capacity:</b>	4 Gigabyte

## 2. Getting started

### Set up the DeNIRO<sup>®</sup> NIR Fluorometer

#### Set up the instrument

The DeNIRO<sup>®</sup> NIR Fluorometer is a stand-alone instrument that does not require connection to a computer.

1. After unpacking the instrument, place the instrument on a flat, level, dry surface.
2. Plug one end of the supplied power cord into the DeNIRO<sup>®</sup> NIR Fluorometer.
3. Attach the appropriate plug adaptor to the other end of the power cord.
4. Plug the power cord into the electrical outlet.



**Note:** Ensure the plug of power adaptor remains accessible to allow disconnection.

5. The instrument automatically powers on, first displaying the splash screen, and then the Home screen (see below).
6. To power down the DeNIRO<sup>®</sup> NIR Fluorometer, unplug it.

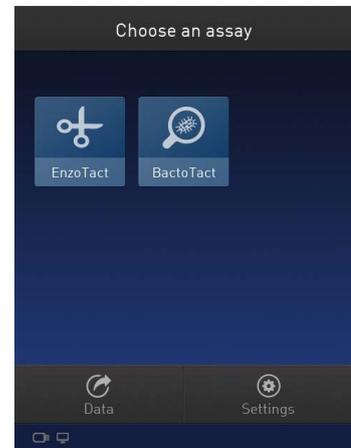


**IMPORTANT!** Use the power cord plug adapter supplied with the instrument that is appropriate for the electrical outlet configuration in your country. Powering the instrument with an unapproved power cord may damage the instrument.

#### Home screen

When the instrument is powered on, the *Home* screen is automatically displayed. From the Home screen, you can:

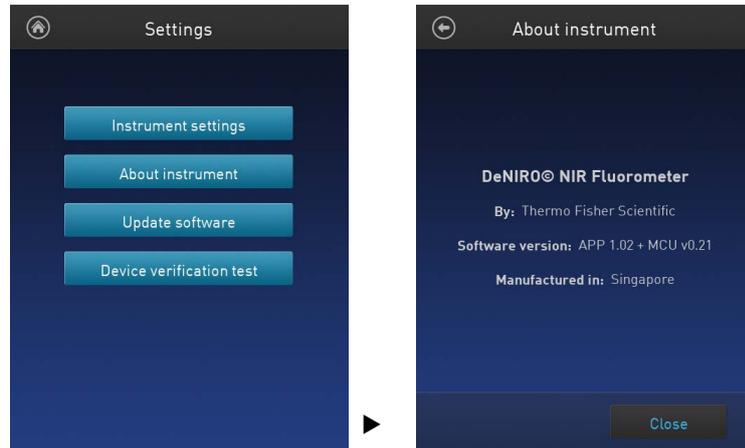
- Select one of the quantitation assays: EnzoTact<sup>®</sup> or BactoTact<sup>®</sup>
- Access saved data
- Configure instrument settings



## About Instrument screen

The *About instrument* screen displays information about your DeNIRO® NIR Fluorometer, including the currently installed software version. To access the About instrument screen:

1. On the Home screen, touch **Settings**.
2. On the Settings screen, touch **About Instrument** to display the About Instrument screen.



3. Touch **Done**, **Cancel**, or **Back** ( ) to return to the Settings screen.

## Optional: Configure Instrument Settings

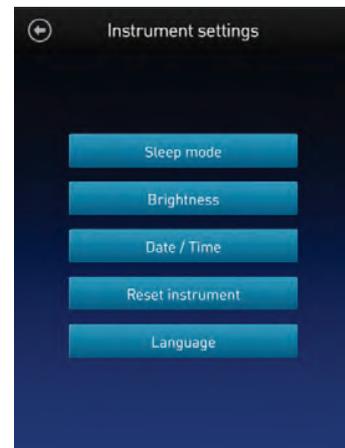
### Introduction

You can configure the following instrument settings for the DeNIRO<sup>®</sup> NIR Fluorometer:

- Sleep mode (page 12)
- Brightness (page 12)
- Date/Time (page 13)
- Reset instrument (page 14)
- Language (page 15)

### Access the Instrument settings screen

1. On the Home screen, touch **Settings**.
2. On the *Settings* screen, touch **Instrument settings** to display the *Instrument settings* screen.

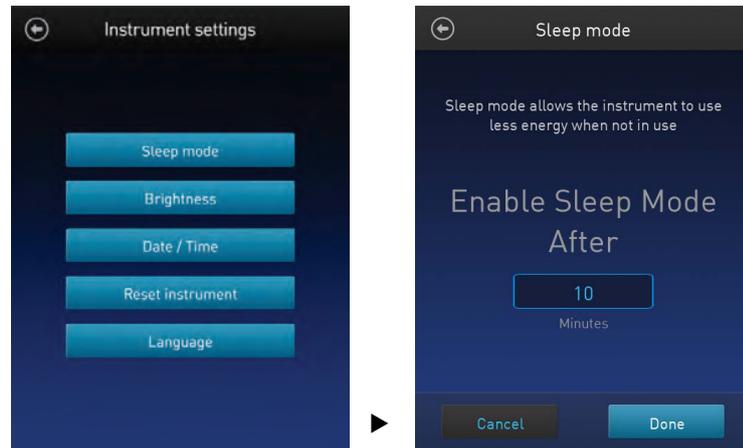


## Adjust the sleep mode

The DeNIRO<sup>®</sup> NIR Fluorometer has a sleep mode (i.e., automatic standby) that is triggered by inactivity.

The system default is 10 minutes of inactivity before the instrument goes into sleep mode. To adjust this time:

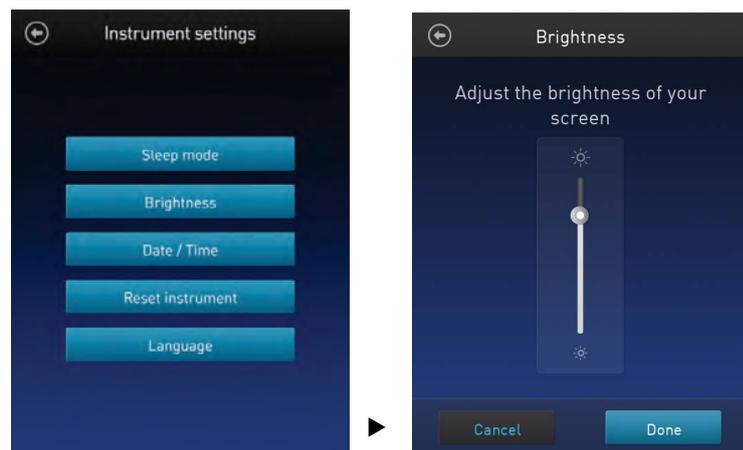
1. On the *Instrument settings* screen (page 11), touch **Sleep mode** to display the *Sleep mode* screen.



2. Enter the time in minutes allowed before the instrument goes into sleep mode by touching the **minutes** text box, then using the pop-up number pad to select a value. The software requires a minimum of 1 minute and a maximum of 60 minutes.
3. Touch **Done** to save the changes and return to the Instrument Settings screen. Touch **Cancel** or **Back** (⏪) to return to the Instrument settings screen without saving the changes.

## Adjust screen brightness

1. On the *Instrument settings* screen (page 11), touch **Brightness** to display the *Brightness* screen.

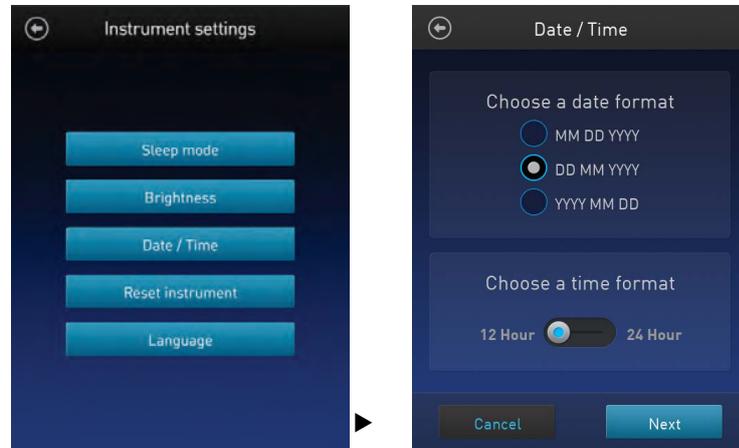


2. Move the slider button up or down to adjust the brightness of the display.
3. Touch **Done** to save the changes and return to the Instrument Settings screen. Touch **Cancel** or **Back** (⏪) to return to the Instrument settings screen without saving the changes.

## Adjust the date and time

The date and time are preset when you receive the instrument. To adjust the date and time:

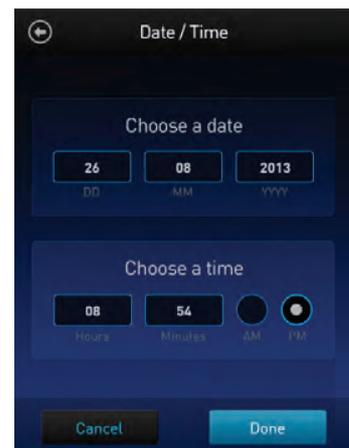
1. On the *Instrument settings* screen (page 11), touch **Date/Time**.



2. Select a date format, select a time format, then touch **Next**.
3. Enter the date and time:

- a. Touch a date field (day, month, or year), then use the pop-up number pad to select a value.
- b. Touch a time field (hours or minutes), then use the pop-up number pad to select a value.
- c. Select **AM** or **PM**.

4. Touch **Done** to save the changes and return to the Instrument Settings screen. Touch **Cancel** or **Back** (⏪) to return to the Instrument settings screen without saving the changes.



## Reset function

The Reset function returns the DeNIRO<sup>®</sup> NIR Fluorometer to its default factory settings, **erasing all saved data, user-defined instrument settings, and custom assays.**

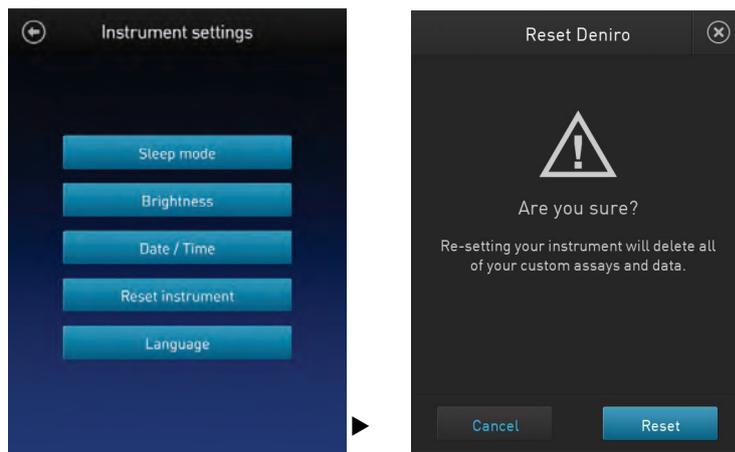


**IMPORTANT!** The reset function is not reversible.

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To return the instrument to its default factory settings:

1. On the *Instrument settings* screen (page 11), touch **Reset instrument** to display the *Reset DeNIRO<sup>®</sup>* screen.

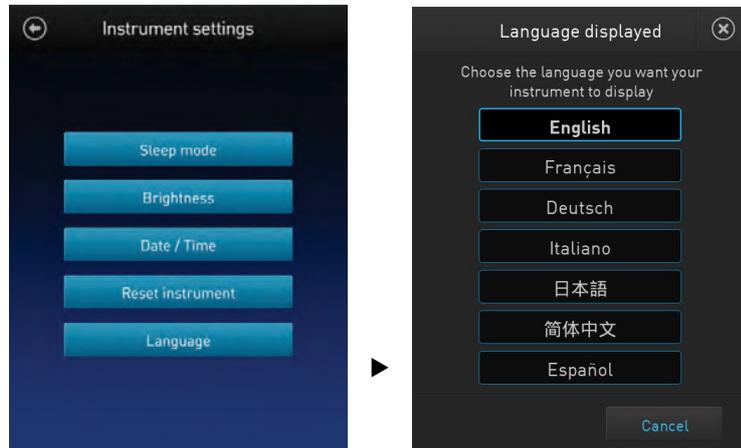


2. Touch **Reset**. After the reset is complete, the Home screen is displayed. All data, user-defined instrument settings, and custom assays are removed. Touch **Cancel** or **Exit** (⊗) to return to the Instrument settings screen without saving the changes.

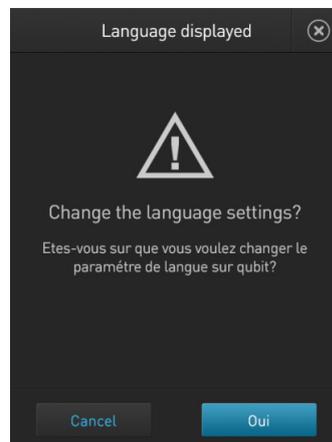
## Change the display language

You can change the language that the DeNIRO® NIR Fluorometer displays to English (default), French, German, Italian, Spanish, simplified Chinese, and Japanese.

1. On the *Instrument settings* screen (page 11), touch **Language** to display the *Language* screen.



2. Select a language, then touch **Next**.
3. Touch **Yes** to confirm the change and return to the Instrument Settings screen. Touch **Cancel** or **Exit** (✕) to return to the Instrument settings screen without saving the changes.



## Guidelines for using the DeNIRO<sup>®</sup> NIR Fluorometer

**Recommendations** To obtain the best results, follow the recommendations below.

- Do **not** operate the instrument in direct sunlight.
- Place the instrument on vibration free surface (i.e. not on same table as vortex or centrifuge)
- Wear gloves during sample handling.
- Use the instrument at room temperature only (22–28°C).
- **At the beginning of every day and with a new batch of Substrate, a blank should be performed.**
- **Keep Substrate refrigerated (2–8°C).**
- Store all reagents refrigerated (2–8°C).
- Insert all assay tubes into the instrument only for as much time as it takes for the instrument to measure the fluorescence.
- Do not hold the assay tubes in your hand before performing a measurement.
- If you are performing multiple readings of a single tube, remove the tube from the instrument and let it equilibrate to room temperature for 30 seconds before taking another reading.

**Assay tubes for the DeNIRO<sup>®</sup> NIR Fluorometer**

Clear 0.5-mL Eppendorf tubes are appropriate for use in the DeNIRO<sup>®</sup> NIR Fluorometer. The minimum assay volume must be 200 µL for an accurate read.

## 3. Perform assays

### Introduction

This section provides instructions for running blanks and for reading the samples using a BactoTact<sup>®</sup> or EnzoTact<sup>®</sup> kit

- Materials needed
- A BactoTact<sup>®</sup> or EnzoTact<sup>®</sup> kit appropriate for quantifying your samples (see page 35 for ordering information)
  - Samples
  - DeNIRO<sup>®</sup> assay tubes or other appropriate 0.5-mL assay tubes



**Note:** For instructions on the preparation of reagents, see the instructions that accompany the assay you are using.

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- *(Optional)* USB drive or USB cable for data transfer, supplied with the instrument or available separately

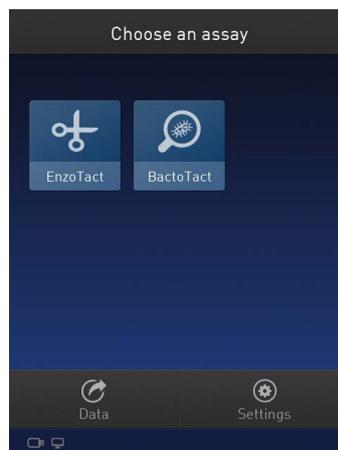
### Running assays on the DeNIRO<sup>®</sup> NIR Fluorometer

#### Introduction

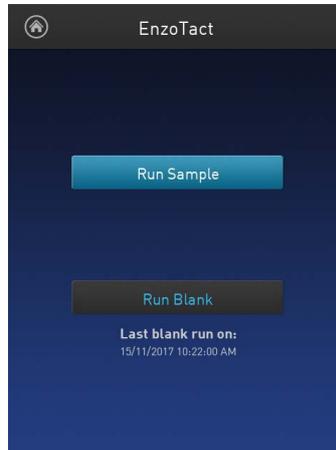
At the beginning of every day and with a new batch of Substrate, a blank should be performed. The blank will automatically be subtracted from readings by the DeNIRO<sup>®</sup> NIR Fluorometer.

#### Read Blank

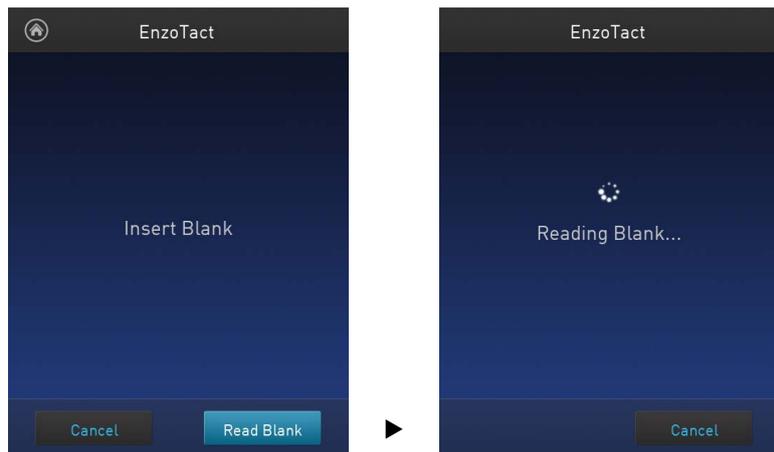
1. On the **Home** screen, touch the **assay** for which you wish to read a blank.



2. In the display you'll find information on Last blank run. To run a new blank. Touch **Run Blank**.



3. The software prompts you to insert the assay tube containing blank. Touch **Read Blank**.

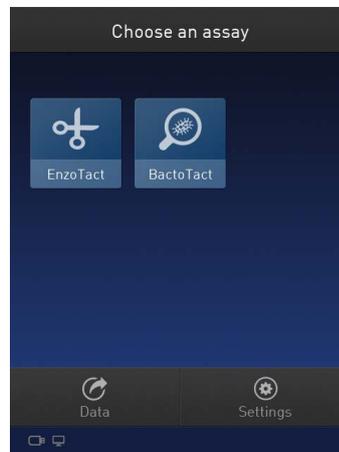


4. The reading takes approximately 3 seconds. The software displays the results. The blank will automatically be subtracted from readings by the DeNIRO© NIR Fluorometer.

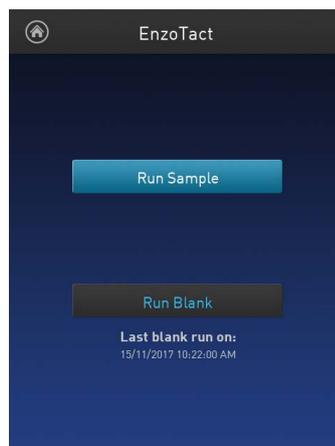
## Read samples

- Before you begin
- At the beginning of every day and with a new batch of Substrate, a blank should be performed. The blank will automatically be subtracted from readings by the DeNIRO© NIR Fluorometer.
  - Prepare the samples. Refer to the instructions provided with the assay.

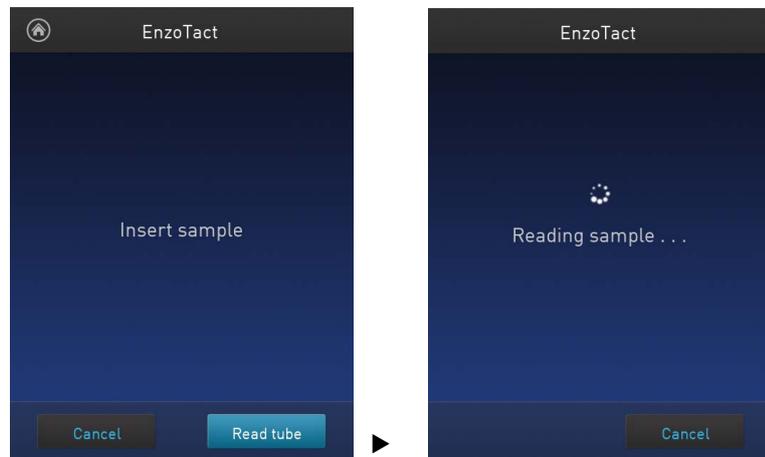
- Read samples
1. On the Home screen, touch the assay for which you wish to read a sample.



2. To run a sample. Touch **Run Sample**.



3. Insert a sample tube into the sample chamber, close the lid, and then touch **Read tube**. The reading takes approximately 3 seconds.



4. The software displays the results. See “Results screen” on page 21.



### Read multiple samples

To read multiple samples for the same assay:

1. Remove the current sample, and insert a new sample.
2. Touch **Read tube**.

# Results

## Introduction

The Fluorometer has an excitation light source (LED), while reading fluorescence in Near Infra Red emission channel only.

The reading is in Relative Fluorescence Units (RFU).

## Results screen

The Results screen displays the results of the sample run. The reading is in Relative Fluorescence Units (RFU).



## 4. Manage data

### Introduction

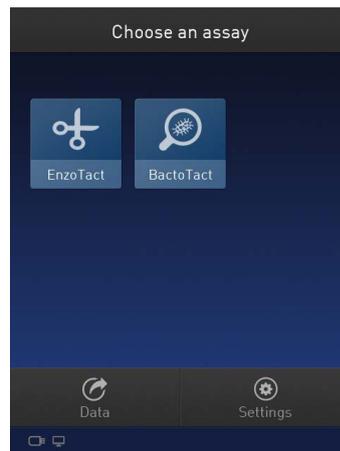
The DeNIRO® NIR Fluorometer can save data for up to 1000 samples. For the saved data, the instrument allows you to:

- View detailed data for each sample (this page).
- Rename data files (page 25).
- Save data as a .CSV (comma separated value) file, and export the .CSV file to a USB drive or directly to your computer (page 26).
- Delete data files (page 29)

### View detailed sample data

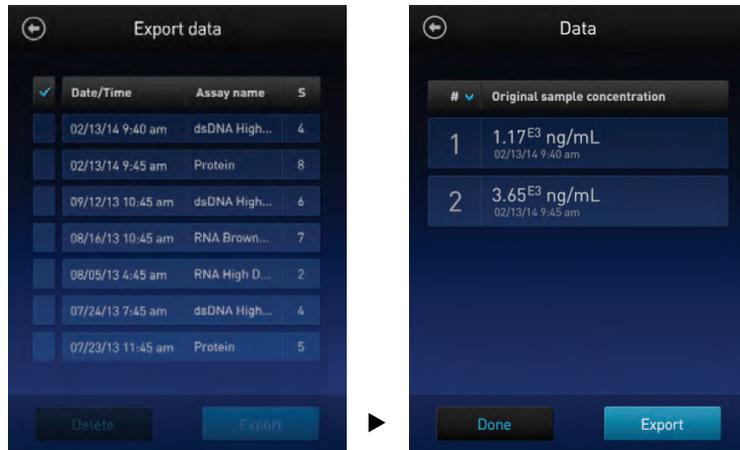
View  
detailed  
sample data

1. From the **Concentration** or **Home** screens, touch **Data**.

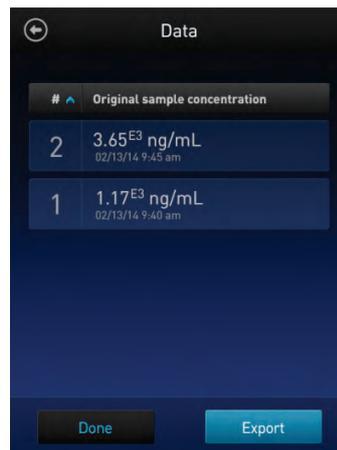


2. On the Export data screen, touch the **data set of interest**.

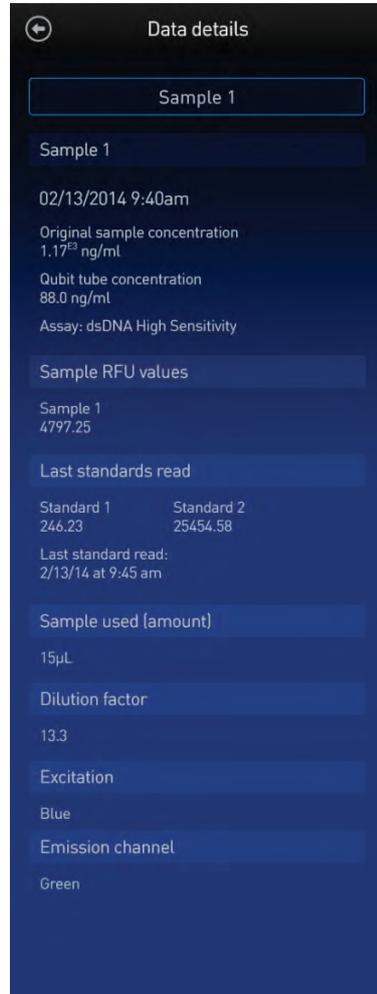
A *Data* screen displaying a list of data entries for that data set appears. To view additional data entries that do not fit in the screen, scroll up or down.



3. To reverse the order in which the data entries appear, press the **blue chevron**  above the sample number column.

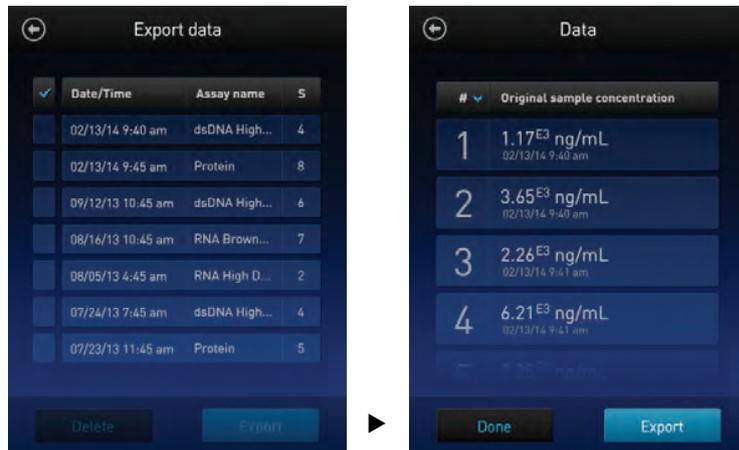


- To view the sample details, touch the **sample of interest**. A *Data details* screen opens.



## Rename data files

- Rename data files
1. From the **Concentration** or **Home** screens, touch **Data**.
  2. On the Export data screen, touch the **data set of interest**.



3. From the list of data entries for the selected data set, touch the **sample of interest** to open the *Data details* screen.
  4. On the Data details screen, touch the **Sample #** text box (indicated by the red arrow).
- On the keyboard which appears, type in the new name and touch **Enter**.



# Export data

## Introduction

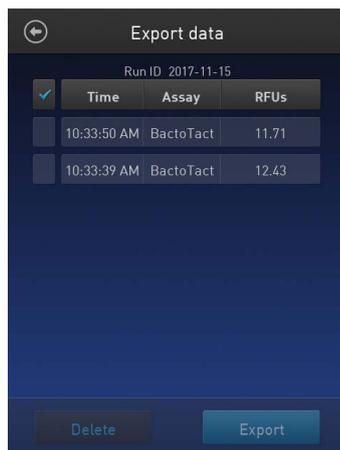
The DeNIRO<sup>®</sup> NIR Fluorometer is designed for standalone use; it does not require an external computer. However, to archive data and generate reports, you can export the numeric data stored in the .CSV file to a computer either by using the USB drive or by saving directly to the computer using the USB cable. You can then import the file into any spreadsheet program.

## Export data using the USB drive

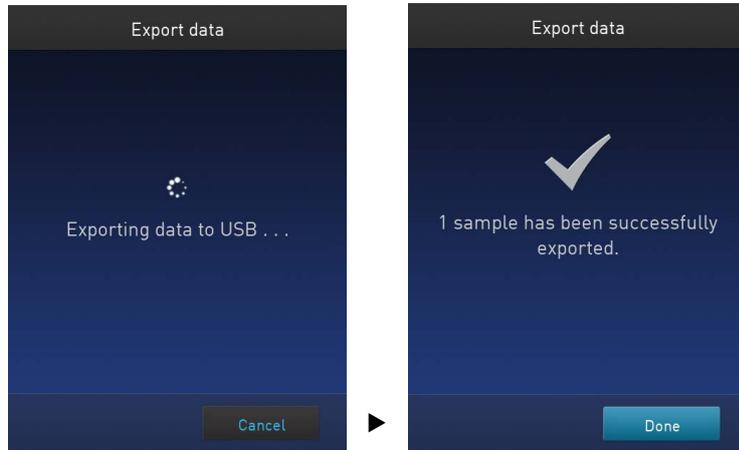
1. Insert the USB drive into the DeNIRO<sup>®</sup> NIR Fluorometer.
2. From the **Concentration** or **Home** screens, touch **Data**.
3. On the *Export data* screen, check the **selection box** to the left of each data set you wish to export.



4. To save only individual data entries from a data set, touch the **data set of interest**, and then check the **selection box** to the left of the sample(s) you wish to export.



5. Touch **Export** to export the data. The numeric data is automatically saved as a .CSV file.



6. Transfer the USB drive to the USB drive port on your computer. You can open the .CSV file using any spreadsheet program.

#### Export data directly to a computer

Data files may also be exported from the DeNIRO<sup>®</sup> instrument to a computer using a USB cable such as the one provided with the DeNIRO<sup>®</sup> instrument. The USB cable must remain connected to both the DeNIRO<sup>®</sup> instrument and the computer during this process.

To export data directly to a computer:

1. Connect the DeNIRO<sup>®</sup> instrument to the computer using the USB cable.
2. From the computer, access the DeNIRO<sup>®</sup> NIR Fluorometer as an external device.
3. Access the files saved on the DeNIRO<sup>®</sup> instrument using the operating system's normal file browsing menus.
4. Copy the desired files to the computer.



**Note:** Files cannot be exported directly to an external computer using the Export workflow on the DeNIRO<sup>®</sup> instrument.

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Information saved  
to the .csv file

**Data details**

Sample 1

Sample 1 ← Sample number

02/13/2014 9:40am ← Date and time

Original sample concentration  
1.17<sup>23</sup> ng/ml ← Original sample concentration and units

Qubit tube concentration  
88.0 ng/ml ← Qubit® tube sample concentration and units

Assay: dsDNA High Sensitivity ← Assay name

Sample RFU values

Sample 1  
4797.25 ← RFU value for the sample

Last standards read

Standard 1	Standard 2
246.23	25454.58

← RFU values for the standards

Last standard read:  
2/13/14 at 9:45 am

Sample used (amount)

15µL ← Volume of original sample used

Dilution factor

13.3 ← Dilution factor

Excitation

Blue ← Excitation

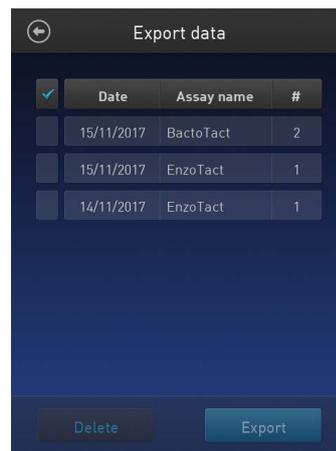
Emission channel

Green ← Emission channel

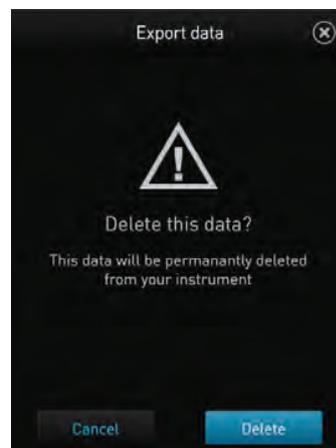
## Delete data

### Delete data files

1. From the **Concentration** or **Home** screens, touch **Data**.
2. On the *Export data* screen, check the **selection box** to the left of each data set you wish to delete.  
To delete only individual data entries from a data set, touch the **data set of interest**, and then check the **selection box** to the left of the sample(s) you wish to delete.



3. Touch **Delete**. A warning screen appears.



4. Touch **Delete** to permanently delete the sample data or data set.  
Touch **Cancel** to return to the screen previously viewed without deleting any data.

## 5. Instrument maintenance

### Maintenance and cleaning

#### Maintenance

The DeNIRO® NIR Fluorometer does not need regular maintenance. To troubleshoot problems with the instrument, contact Technical Support (page 44).

- **Do not** perform any repairs or service on the DeNIRO® NIR Fluorometer to avoid damaging the instrument.
- **Do not expose the DeNIRO® NIR Fluorometer to direct sunlight.**



**CAUTION!** Never disassemble or service the instrument yourself. Do not remove any covers or parts that require the use of a tool. Unauthorized repairs may damage the instrument or alter its functionality, which may void your warranty. Contact your local distributor to arrange for service.

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#### DeNIRO® NIR Fluorometer

We recommend cleaning the DeNIRO® NIR Fluorometer periodically to prevent the buildup of dust and dirt that might reduce its performance and cause contamination.



**CAUTION!** To avoid electrical shock, always disconnect the power cable before cleaning or decontaminating the instrument.

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**IMPORTANT!** Using a cleaning or decontaminating method other than that manufacturer may result in damage to the instrument.

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- Clean the surface of the DeNIRO® NIR Fluorometer with a damp cloth.
- To clean the touch screen, disconnect the power cable, and clean the touch screen with a soft cloth lightly moistened with LCD (liquid crystal display) cleansing detergent.
- Cleaning the screen with excessive force can damage the touch screen. Wipe the screen dry immediately.
- Do not use abrasive cleaning solutions or material to prevent the touch screen from getting scratched.
- To disinfect the instrument, disconnect the power cable from the DeNIRO® NIR Fluorometer and clean the instrument, including the touch screen, with a soft cloth lightly moistened with 70% ethanol, 70% isopropanol, or 10% bleach (0.6% sodium hypochlorite).
- The cloth included with the instrument is not recommended for use with ethanol or isopropanol.
- Ensure that the cleaning solution does not enter the power button, the power inlet, the sample port, or the USB drive ports.
- Never pour or spray any liquids directly on the instrument to avoid electrical shock when the instrument is plugged in.

# Software updates

## Update the software

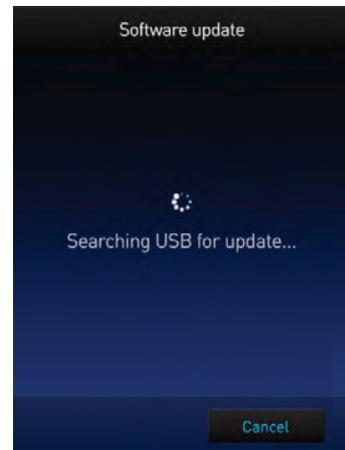
To update the DeNIRO<sup>®</sup> NIR Fluorometer with the latest software from Detact Diagnostics:

1. Download the latest software to a USB drive or to your computer from **detactdiagnostics.com/deniro**.
2. If using a USB drive, insert the USB drive into the instrument. If using a computer, connect the DeNIRO<sup>®</sup> instrument to the computer using a USB cable. The DeNIRO<sup>®</sup> NIR Fluorometer will be recognized as an external device by the computer.



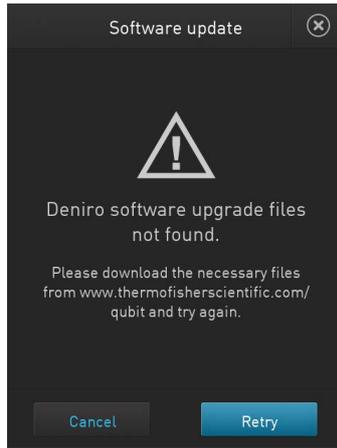
**Note:** The connection between the computer and the DeNIRO<sup>®</sup> instrument must be maintained until the transfer and update (described in the next steps) are complete.

- a. On your computer, find the DeNIRO<sup>®</sup> software update file that you wish to upload.
  - b. Copy and paste or click and drag the software file to the DeNIRO<sup>®</sup> instrument drive. This will save the software file to the root directory of your DeNIRO<sup>®</sup> instrument; however, the software file transfer will not be visible on the DeNIRO<sup>®</sup> instrument.
3. On the Home screen, touch **Settings**.
  4. On the Settings screen, touch **Update software**. The instrument searches the USB drive or the computer for the update.

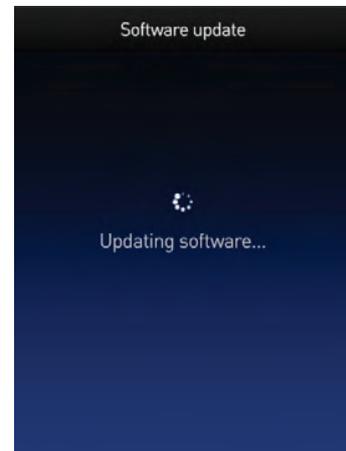
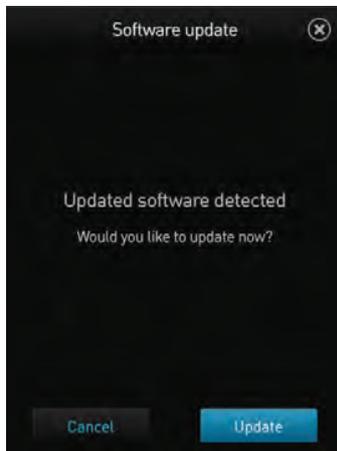


**Note:** If the USB drive is not inserted into the USB drive port or the instrument does not recognize the USB drive, a warning message is displayed.

To proceed with the software update, insert the correct USB drive into the instrument, then touch **Close**.



6. When the appropriate files are detected, the Software update screen is displayed. Touch **Update** to update the software.



7. When prompted, touch **Restart** to complete the software update.

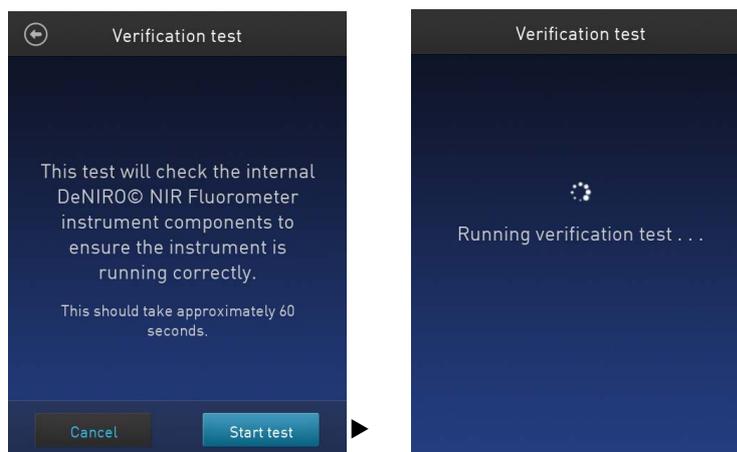


## Device verification test

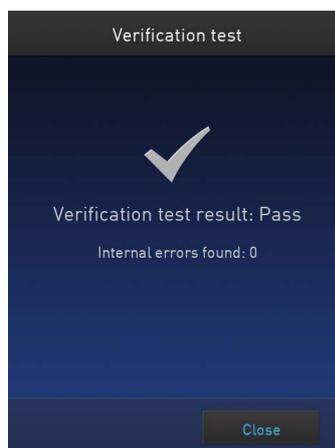
### Perform Device verification test

The device verification test checks the internal components of the DeNIRO© NIR Fluorometer. Perform the device verification test when a problem with the instrument is suspected. It is not necessary to perform verification testing on a regular basis.

1. On the Home screen, touch **Settings**.
2. On the Settings screen, touch **Device verification test**. *Verification test* screen opens.
3. On the Verification test screen, touch **Start test**.



4. When the test is complete, the software displays the error status.
  - If no errors are found, touch **Close** to return to the Settings screen.



- If errors are found, a *Failed message* appears. Be sure the test was run with the lid closed. If the Failed message persists with the lid closed, contact Technical Support for help (page 44).

# Appendix A: Troubleshooting

## Troubleshooting

- Handling samples
- Ensure that the assay tubes are at room temperature at the time the reading is taken. Do not hold assay tubes in your hand and do not leave assay tubes in the DeNIRO<sup>®</sup> NIR Fluorometer for longer than it takes to read the fluorescence.
  - Be careful not to spill sample into the sample chamber. Promptly wipe any spills.
  - The DeNIRO<sup>®</sup> assays are very sensitive and even small amounts of material from a previous sample may result in errors. Use a clean 0.5-mL Eppendorf tube for each reading.
  - The tube **must be clean and dry** on the outside when taking readings. Moisture and condensation on the tube surface can lead to reading errors.
  - Minute bubbles in samples will cause errors in readings. Be sure not to introduce bubbles into samples. Slight tapping on the tube wall or brief centrifugation will often help dissipate bubbles.

## Appendix B: Ordering information

### DeNIRO<sup>®</sup> NIR Fluorometer and accessories

The following products can be used with the DeNIRO<sup>®</sup> NIR Fluorometer and are available separately from Detact Diagnostics. For more information, visit [www.detactdiagnostics.com](http://www.detactdiagnostics.com) or contact Technical Support (page 44).

Product	Quantity	Cat. no.
DeNIRO <sup>®</sup> NIR Fluorometer	1 each	30010
DeNIRO <sup>®</sup> NIR Fluorometer International Power Supply (replacement)	1 each	30011
DeNIRO <sup>®</sup> Assay Tubes 0.5 mL	500 tubes	30020
DeNIRO <sup>®</sup> Assay Tubes 2.0 mL	500 tubes	30030
MySPIN 12 minicentrifuge	1 each	40010
Vortex	1 each	40020
EnzoTact <sup>®</sup> PRO Assay Set	96 tests	10041
EnzoTact <sup>®</sup> PRO Control Solution	controls	10044

# Appendix C: Safety

## Symbols on instruments

### Electrical symbols

The following table describes the electrical symbols that may be displayed.

Symbol	Description
	Indicates a terminal that can receive or supply alternating current or voltage.

### Safety symbols

The following table describes the safety symbols that may be displayed. Each symbol may appear by itself or in combination with text that explains the relevant hazard (see “Safety labels on instruments”). These safety symbols may also appear next to DANGERS, WARNINGS, and CAUTIONS that occur in the text of this and other product-support documents.

Symbol	Description
	Indicates that you should consult the manual for further information and to proceed with appropriate caution.
	Indicates the presence of an electrical shock hazard and to proceed with appropriate caution.

### Environmental symbols

The following symbol applies to all Detact Diagnostics electrical and electronic products placed on the European market after August 13, 2005.

Symbol	Description
	<b>Do not dispose of this product as unsorted municipal waste.</b> Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of waste electrical and electronic equipment (WEEE).

## Safety labels on instruments

The following CAUTION, WARNING, and DANGER statements may be displayed on Life Technologies™ instruments in combination with the safety symbols described in the preceding section.

Hazard symbol	English	Français
	<p><b>CAUTION!</b> Hazardous chemicals. Read the Safety Data Sheets (SDSs) before handling.</p>	<p><b>ATTENTION!</b> Produits chimiques dangereux. Lire les fiches techniques de sûreté de matériels avant toute manipulation de produits.</p>
	<p><b>CAUTION!</b> Hazardous waste. Refer to SDS(s) and local regulations for handling and disposal.</p>	<p><b>ATTENTION!</b> Déchets dangereux. Lire les fiches techniques de sûreté de matériels et la réglementation locale associées à la manipulation et l'élimination des déchets.</p>
	<p><b>DANGER!</b> High voltage.</p>	<p><b>DANGER!</b> Haute tension.</p>
	<p><b>WARNING!</b> To reduce the chance of electrical shock, do not remove covers that require tool access. No user-serviceable parts are inside. Refer servicing to qualified service personnel.</p>	<p><b>AVERTISSEMENT!</b> Pour éviter les risques d'électrocution, ne pas retirer les capots dont l'ouverture nécessite l'utilisation d'outils. L'instrument ne contient aucune pièce réparable par l'utilisateur. Toute intervention doit être effectuée par le personnel de service qualifié.</p>

## General instrument safety



**WARNING! PHYSICAL INJURY HAZARD.** Use this product only as specified in this document. Using this instrument in a manner not specified may result in personal injury or damage to the instrument.

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### Operating the instrument

Ensure that anyone who operates the instrument has:

- Received instructions in both general safety practices for laboratories and specific safety practices for the instrument.
- Read and understood all applicable Safety Data Sheets (SDSs). See “Safety Data Sheets (SDS)”.

### Safety precautions

- Do not install the instrument in heavy humidity such as a greenhouse or an incubator to avoid a danger of electric shock. If water or other material enters the instrument, the adaptor, or power inlet, disconnect the power cord and contact a service person. For operating environment, refer to “Product specifications” (page 8).
- Do not touch the main plug or power cord with wet hands.
- Always ensure that the power supply input voltage matches the voltage available in your location.
- Do not install the instrument on a slant or a place prone to vibrations, which induces the risk of instrument malfunction or damage of the instrument.
- Plug the power cord firmly into the wall outlet and the instrument.
- To avoid potential shock hazard, make sure that the power cord is properly grounded.
- Be sure to position the equipment such that it is easy to disconnect the instrument.
- If the instrument is broken or dropped, disconnect the power cord and contact technical services. Do not disassemble the instrument.
- Use only authorized accessories (adaptor, power cord, and USB drive).
- For operating environment, see “Product specifications” (page 8).
- If the instrument emits smoke, disconnect the power cord from the wall outlet and contact technical services.

### Cleaning or decontaminating the instrument



**CAUTION!** Using cleaning or decontamination methods other than those recommended by the manufacturer may compromise the safety or quality of the instrument.

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### Removing covers or parts of the instrument



**CAUTION! PHYSICAL INJURY HAZARD** The instrument is to be serviced only by trained personnel or vendor specified in the user guide. Do not remove any covers or parts that require the use of a tool to obtain access to moving parts.

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## Chemical safety

Chemical hazard  
warning



**WARNING! CHEMICAL HAZARD.** Before handling any chemicals, refer to the Safety Data Sheet (SDS) provided by the manufacturer, and observe all relevant precautions.

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**WARNING! CHEMICAL STORAGE HAZARD.** Never collect or store waste in a glass container because of the risk of breaking or shattering. Reagent and waste bottles can crack and leak. Each waste bottle should be secured in a low-density polyethylene safety container with the cover fastened and the handles locked in the upright position. Wear appropriate eyewear, clothing, and gloves when handling reagent and waste bottles.

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General  
safety  
guidelines

To minimize the hazards of chemicals:

- Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. (See “Safety Data Sheets (SDS)”)
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the SDS.
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood). For additional safety guidelines, consult the SDS.
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer’s cleanup procedures as recommended in the SDS.
- Comply with all local, state/provincial, or national laws and regulations related to chemical storage, handling, and disposal.

## Chemical waste safety

Chemical waste hazard



**CAUTION! HAZARDOUS WASTE.** Refer to Safety Data Sheets (SDSs) and local regulations for handling and disposal.

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Chemical waste safety guidelines

To minimize the hazards of chemical waste:

- Read and understand the Safety Data Sheets (SDSs) provided by the manufacturers of the chemicals in the waste container before you store, handle, or dispose of chemical waste.
- Provide primary and secondary waste containers. (A primary waste container holds the immediate waste. A secondary container contains spills or leaks from the primary container. Both containers must be compatible with the waste material and meet federal, state, and local requirements for container storage.)
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the SDS.
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood). For additional safety guidelines, consult the SDS.
- Handle chemical wastes in a fume hood.
- After emptying the waste container, seal it with the cap provided.
- Dispose of the contents of the waste tray and waste bottle in accordance with good laboratory practices and local, state/provincial, or national environmental and health regulations.

Waste disposal

If potentially hazardous waste is generated when you operate the instrument, you must:

- Characterize (by analysis, if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- Ensure the health and safety of all personnel in your laboratory.
- Ensure that the instrument waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.



**IMPORTANT!** Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

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## Electrical safety

	<hr/>  <b>DANGER! ELECTRICAL SHOCK HAZARD.</b> Severe electrical shock can result from operating the DeNIRO® NIR Fluorometer without its instrument panels in place. Do not remove instrument panels. High-voltage contacts are exposed when instrument panels are removed from the instrument. <hr/>
Power	<hr/>  <b>DANGER! ELECTRICAL HAZARD.</b> Grounding circuit continuity is vital for the safe operation of equipment. Never operate equipment with the grounding conductor disconnected. <hr/>
	<hr/>  <b>DANGER! ELECTRICAL HAZARD.</b> Use properly configured and approved line cords for the voltage supply in your facility. <hr/>
	<hr/>  <b>DANGER! ELECTRICAL HAZARD.</b> Plug the system into a properly grounded receptacle with adequate current capacity. <hr/>
Overvoltage rating	The DeNIRO® NIR Fluorometer has an installation (overvoltage) category of II, and is classified as portable equipment.

## Biological hazard safety



**WARNING! BIOHAZARD.** Biological samples such as tissues, body fluids, and blood of humans and other animals have the potential to transmit infectious diseases. Follow all applicable local, state/provincial, and/or national regulations. Wear appropriate protective eyewear, clothing, and gloves. Read and follow the guidelines in these publications.

**ATTENTION! BIOHAZARD.** Les échantillons biologiques tels que les tissus, les fluides corporels et le sang des humains et d'autres animaux ont la possibilité de transmettre des maladies infectieuses. Suivre tous les règlements municipaux, provinciaux/provincial et / ou nationales en vigueur. Porter des lunettes de protection approprié, des vêtements et des gants.

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### In the U.S.:

- U.S. Department of Health and Human Services guidelines published in *Biosafety in Microbiological and Biomedical Laboratories* (stock no. 017-040-00547-4; [www.cdc.gov/OD/ohs/biosfty/bmbl4/bmbl4toc.htm](http://www.cdc.gov/OD/ohs/biosfty/bmbl4/bmbl4toc.htm))
- Occupational Safety and Health Standards, Bloodborne Pathogens (29 CFR§1910.1030; [www.access.gpo.gov/nara/cfr/waisidx\\_01/29cfr1910a\\_01.html](http://www.access.gpo.gov/nara/cfr/waisidx_01/29cfr1910a_01.html))
- Your company's/institution's Biosafety Program protocols for working with/handling potentially infectious materials.
- Additional information about biohazard guidelines is available at: [www.cdc.gov](http://www.cdc.gov)

### In the EU:

- Check your local guidelines and legislation on biohazard and biosafety precaution, and the best practices published in the World Health Organisation (WHO) Laboratory Biosafety Manual, third edition [www.who.int/csr/resources/publications/biosafety/WHO\\_CDS\\_CSR\\_LYO\\_2004\\_11/en/](http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/)

# Safety and Electromagnetic Compatibility (EMC) standards

This section provides information on:

- U.S. and Canadian safety standards
- European safety and EMC standards
- Australian EMC standards

U.S. and  
Canadian Safety  
Standards



This instrument has been tested to and complies with standard:

UL 61010-1/CSA C22.2 No. 61010-1, "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements."

European Safety  
and EMC  
Standards



## **Safety**

This instrument meets European requirements for safety (Low Voltage Directive 2006/95/EC). This instrument has been tested to and complies with standards:

IEC/EN 61010-1:2001, "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, Part 1: General Requirements."

IEC/EN 61010-2-081:2003, "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"

## **EMC**

This instrument meets European requirements for emission and immunity (EMC Directive 2004/108/EC). This instrument has been tested to and complies with standard IEC/EN 61326 (Group 1, Class B), "Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements."

Australian EMC  
standards



This instrument has been tested to and complies with standard AS/NZS CISPR 11, "Limits and Methods Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific, and Medical (ISM) Radio-frequency Equipment."

## Documentation and

### support Obtaining support

Technical support	<p>For the latest services and support information for all locations, go to <a href="http://www.lifetechnologies.com">www.lifetechnologies.com</a>.</p> <p>At the website, you can:</p> <ul style="list-style-type: none"><li>• Access worldwide telephone and fax numbers to contact Technical Support and Sales facilities</li><li>• Search through frequently asked questions (FAQs)</li><li>• Submit a question directly to Technical Support (<a href="mailto:techsupport@lifetech.com">techsupport@lifetech.com</a>)</li><li>• Search for user documents, SDSs, vector maps and sequences, application notes, formulations, handbooks, certificates of analysis, citations, and other product support documents</li><li>• Obtain information about customer training</li></ul>
Safety Data Sheets (SDS)	<p>Safety Data Sheets (SDSs) are available on request.</p> <hr/> <p> <b>IMPORTANT!</b> For the SDSs of chemicals not distributed by Detact Diagnostics contact the chemical manufacturer.</p> <hr/>
Limited product warranty	<p>Detact Diagnostics warrant their products as set forth in the Thermo Fisher Scientific General Terms and Conditions of Sale found on Thermo Fisher Scientific website at <a href="http://www.thermofisher.com/termsandconditions">www.thermofisher.com/termsandconditions</a>.</p> <p>If you have any questions, please contact Thermo Fisher Scientific at <a href="http://www.thermofisher.com/support">www.thermofisher.com/support</a>.</p> <hr/> <p> <b>IMPORTANT!</b> Wiping the DeNIRO NIR Fluorometer computer (i.e., erasing the hard drive to remove all programs, files, and the operating system) voids the product warranty.</p>

**For more information go to [detactdiagnostics.com/deniro](http://detactdiagnostics.com/deniro)**

December 2017

