700002783 | 9680
Issue Date: 2024-06

User Manual

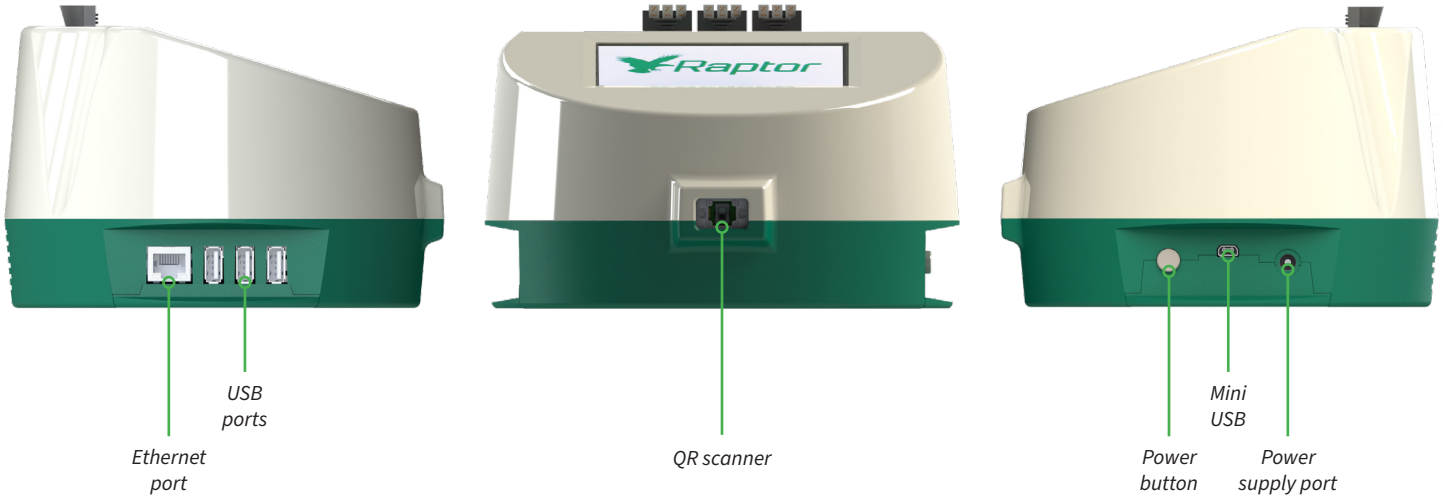
Raptor Integrated Analysis Platform

Introduction

The Raptor® Integrated Analysis Platform is a lateral flow test strip reader with built-in incubation. The instrument provides an easy way to objectively analyze and store the results of Neogen's lateral flow tests. The instrument is capable of analyzing up to three samples independently and simultaneously, provided they are set to the same incubation temperature and time.

Materials Provided

- Instrument
- Calibration cartridge
- Power cable and international adapters
- USB communication cable



Calibration cartridge

Power cable and international adapters

USB communication cable

Port cover

Optional Accessories

- Positive and negative standards (700002788)
- Mini keyboard (700004069 | 9689)
- Raptor thermometer assembly (700002789 | 9686)
- Printer (700004067 | 9687)
- Printer paper (700004068 | 9688)

Positive and negative standards

Mini keyboard

Raptor thermometer assembly

Printer

Printer paper

Getting Started

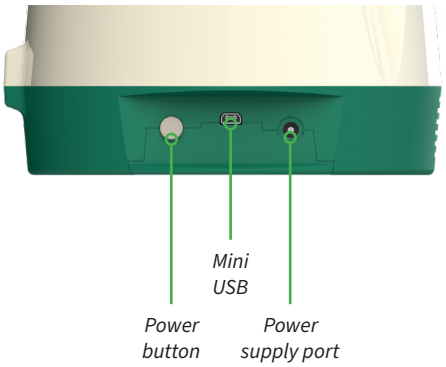
The Raptor instrument must be connected to a power source to be turned on.

Storage Conditions

Store the Raptor instrumen in a dry, dust free environment at normal room temperature. Using the supplied Raptor port cover will help keep the instrument free from dust.

Turning on the Unit

Press the power button on the right-hand side of the reader to turn it on.



Startup Calibration Check

During boot up, the instrument performs a baseline calibration check. This check verifies that the camera is in line with the position of the cartridges. It also confirms that the illumination is consistent with its factory calibrated settings. When the validation passes, the unit will boot up directly to the home screen. If the validation fails, a message will be displayed indicating this failure. Contact Neogen support for further instructions.

Connecting to Computer (USB)

The Raptor reader can be connected to a computer using the mini USB to standard USB cable. Insert the mini USB connector into the reader between the power button and power supply port on the right side of the reader. Connect the standard USB end of the cable into the computer. From the home screen, click the computer icon in the bottom right corner to enter data transfer mode.

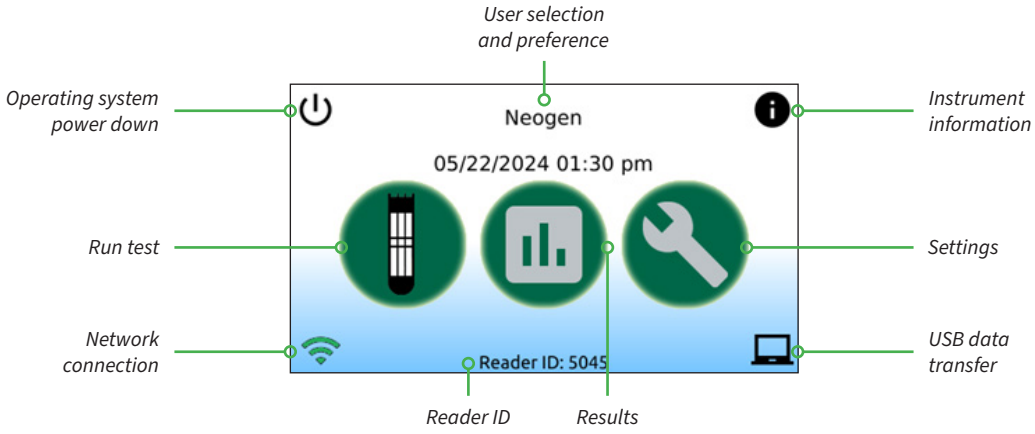
Connect to Local Area Network (Ethernet or Wi-Fi)

The Raptor reader can be connected to a local area network through the available Ethernet port or through available Wi-Fi networks. From the home screen, click the Wi-Fi button in the bottom left corner.

Installing the Data Manager

Raptor Data Manager is a software program that allows the results to be stored and viewed from a computer independent of the instrument. It can be installed onto a computer using the standard software installer on the provided USB flash drive. For more information, see the Data Manager section.

Navigating the Unit

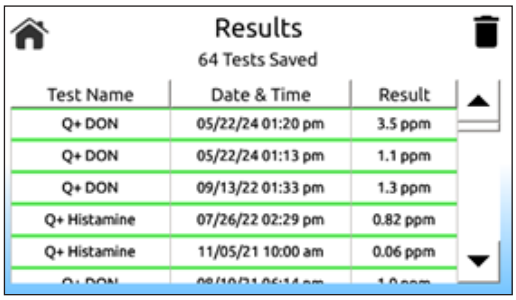


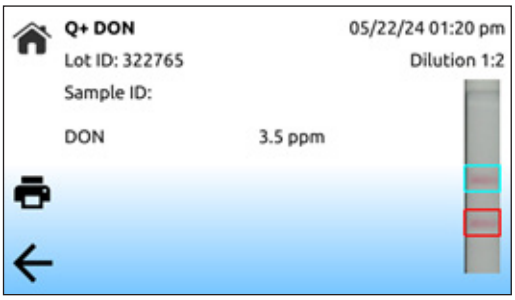
Home Screen

The three large icons in the center of the home screen allow the user to run new tests, view results from previous tests, and configure instrument settings. Additional icons around the perimeter of the home screen allow the user to easily access other useful features with a single touch. Current user, reader ID, and current time and date can also be seen from the home screen.

From the main menu, you have access to a number of features:

- Run test – select the Run Test icon on the left-hand side of the home screen and follow the onscreen instructions.
- Results – select the Results icon in the center of the home screen to view completed results. You may view additional details of the result by selecting it from the list. If a printer has been enabled, you can select the Printer icon on the left-hand side of the screen to print the result. Press the Home button (top left-hand corner) to return to the Main Menu Screen.

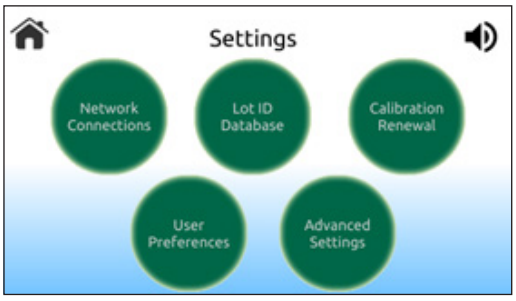




Settings Menu

Select the Settings icon on the right-hand side of the home screen to set up user preferences.

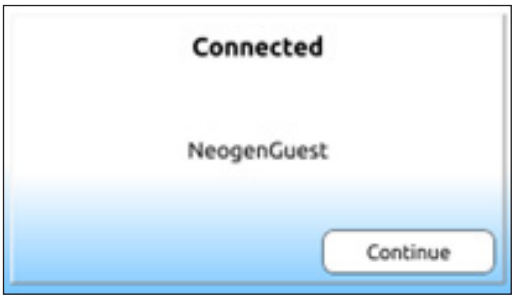
- Pressing the home icon on the top left-hand side of the settings screen will return you to the main menu screen.
- Pressing the volume icon on the top right-hand side of the settings screen allows you to adjust the volume from off to high.



Network Connections

The Raptor can be connected to either a wireless (WLAN) or local (LAN) network. Select the Network Connections button to:

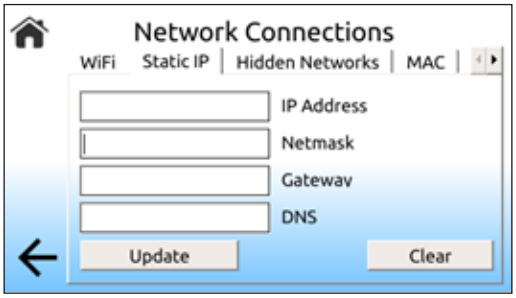
- Connect to a wireless (WLAN) network:



  - Select Wi-Fi on the top left corner of the menu to refresh the list of available connections
  - Select the desired network
  - Enter the network password
  - Select Connect
  - Select Continue once the instrument has connected.
  - Select the Home icon in the top left-hand corner to return to the main menu. The Wi-Fi icon in the bottom left-hand corner should turn from red (disconnected) to green (connected).

- Connect to a local (LAN) network:
  - Select Static IP tab from the menu
  - Enter the IP address, Netmask, Gateway, and DNS information
  - Select Save

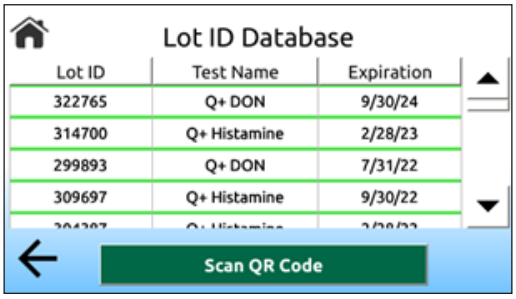
Note: Data cannot be transferred over a wireless (WLAN) network. The wireless connection is to allow for Raptor software/ firmware updates.



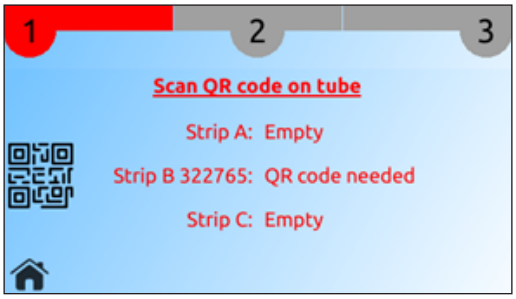
Lot ID Database

The Lot ID database stores lot-specific information.

- Each kit lot has a lot specific QR code that contains all the lot-specific information.
- To run a test strip, the lot information must be saved on the instrument.
- There are two ways to add Lot ID information to the Database:
  - From the Lot ID Database screen, Select Scan QR Code button to add new kit lots to the instrument. The QR Scanner on the front of the instrument will initiate and the user scans the QR code found on the test strip tube. Once the lot specific QR code has been scanned, the lot information will be saved, and the user will not be prompted to scan it again.



  - You can also add the Lot ID information during the Run Test protocol. Once the test strip is placed into a cartridge, and placed into the reader, the system will prompt the user to scan the QR code if the specific Lot ID information is not already saved in the system. Once scanned, the information is added to the database and the user will not be prompted to scan it again.



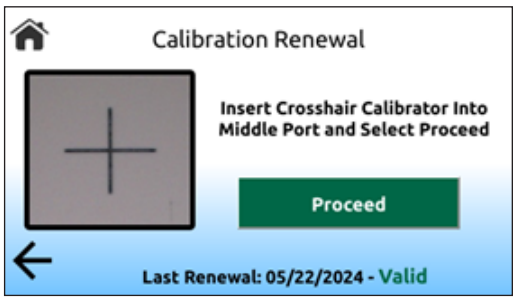
Calibration Renewal

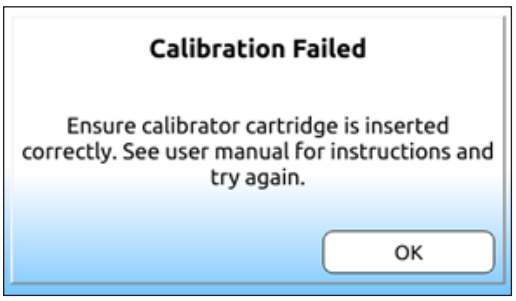
The Raptor requires a yearly Calibration renewal. The annual renewal is used to validated the positional calibration of the internal components of the instrument. Each Raptor instrument includes a white calibration cartridge that is utilized for this process.

Calibration cartridge

To perform the calibration:

- Insert the calibration cartridge into the center port of the instrument with the crosshair (+) facing you. Once in place, press Proceed on the screen.
- The calibration verification will reset to the date of calibration and a valid status will be shown. If you have not placed the calibration cartridge correctly, you may see the failed message. Repeat the process above and if another failure, contact Technical Support.

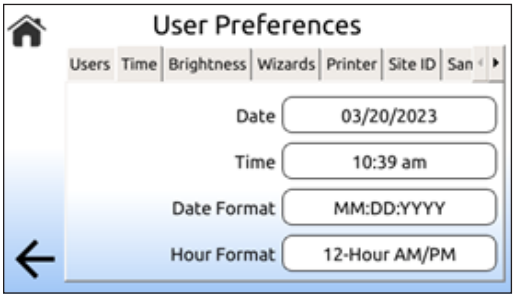




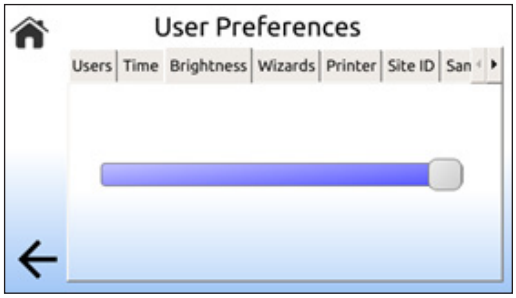
User Preferences

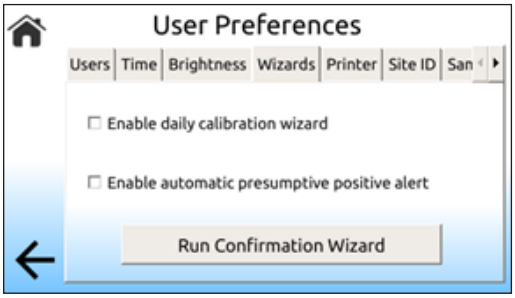
The User Preference Screen has multiple tabs to configure the instrument.

- Users – add or delete operators on this tab; This is where you select the current operator running the assays, so identification is captured with the data.
- Time – the date and time can be set from tis tab and configured for company or regional preferences. The time recorded on the test results will be based on the time set here.



- Brightness – the brightness of the display screen can be adjusted to accommodate different testing environmental conditions.
- Wizards – this feature is currently not active.

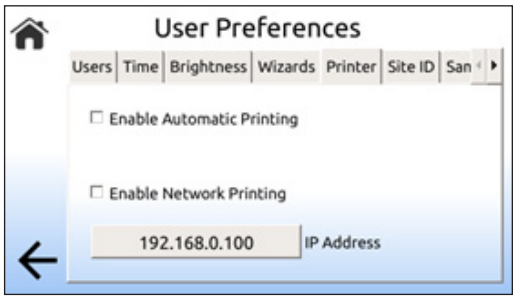


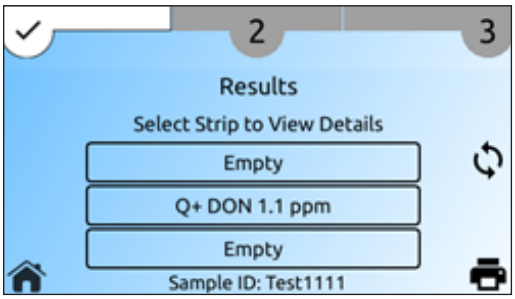


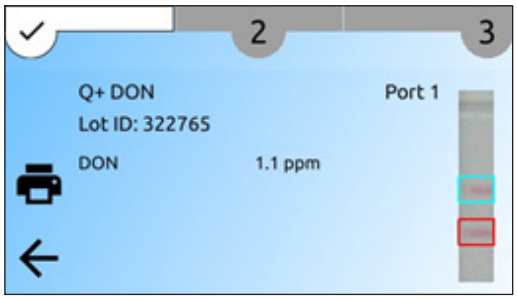
- Printer – enable the automatic or network printing from this screen. When enabled, results will be printed automatically upon completion of the analysis.

  Printing Results from the Raptor

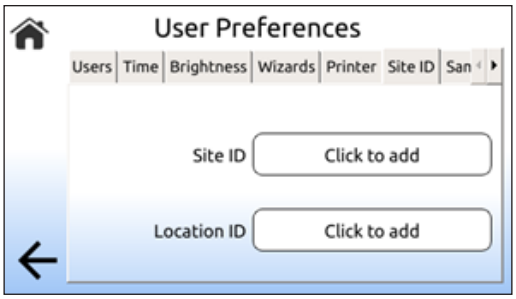
  - A compatible printer must be connected through a USB to print results. There are two methods for printing test results:
    - Automatic Print
      - When enabled, the results are automatically sent to the connected printer when the strip analysis is completed.
      - If a printer is not connected, an error message will alert the user that the results could not be printed.
    - Manual Print
      - From the results page following a test run, the user can press the print button on the lower right-hand corner of the screen to print the results from that assay.
      - You can also print the results from the detail screen.



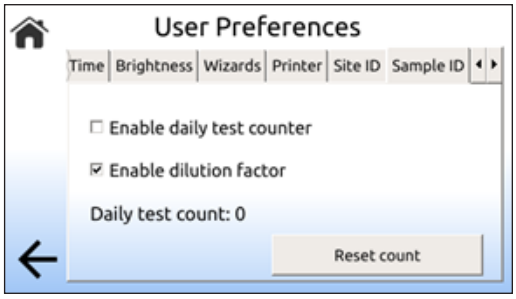


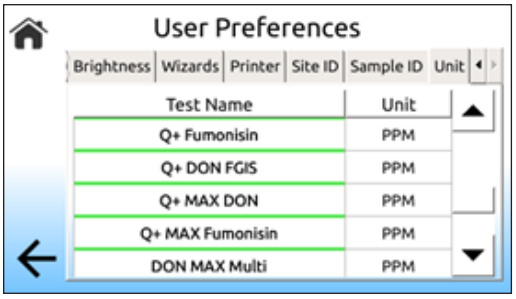


- Site ID – from this tab, you can add optional identification information on the instrument. For example, the location may be City, State, and a site may be QA lab.



- Sample ID – from this tab, you can enable either the daily test counter (shows how many assays performed in a single day) or the dilution factor feature. The dilution factor allows users to enter sample dilution used for results over the curve limit and have the final result shown on the screen and transferred to the data manager to reflect the dilution used.
- Unit – allows the unit of measure associated with an assay to be displayed as PPM, PPB, or PPT based on local regulations and site preferences. Each assay can be set up independently.

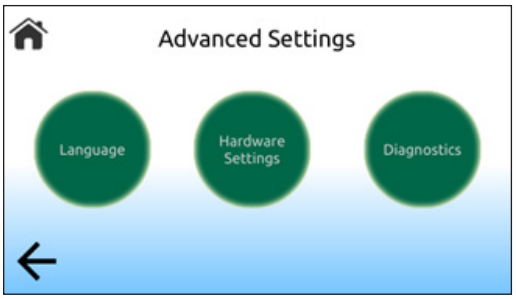




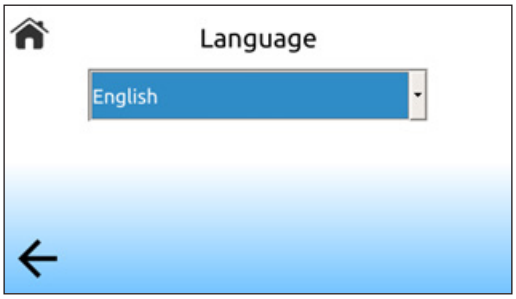
Advanced Settings

The Advanced Settings screen is password protected for certain functions.

To Access the Advanced settings – enter the password and press Accept.



- Language – select the desired language and all functionalities including the keyboard will be set to the selected language.

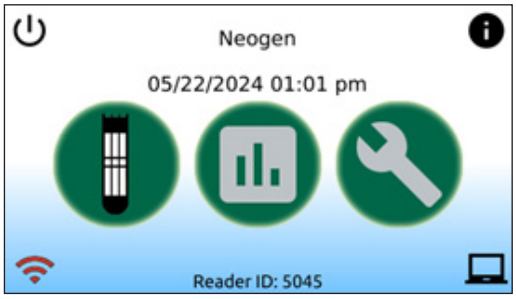


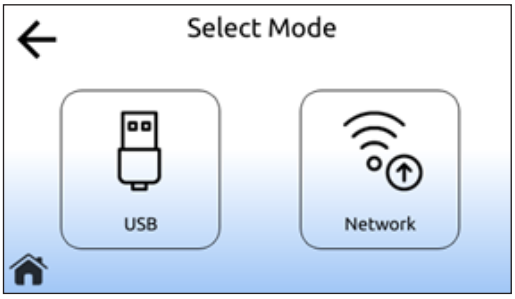
- Hardware settings – these settings are further password protected and may be accessed by technical support personnel.
- Diagnostics – this tab is used to access the heater testing. Please contact technical support personnel for more information. The second tab within Diagnostic will reset factory settings and should only be used when instructed by technical support personnel.

USB Data Transfer

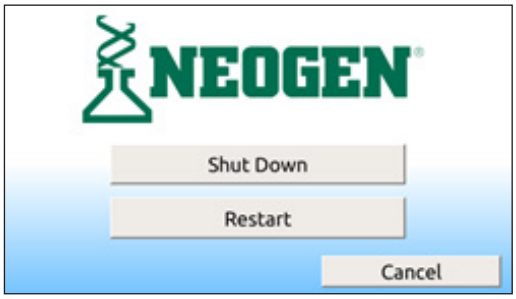
Connecting the instrument to a computer allows the transfer of results to the Data Manager.

Select the computer icon in the lower right corner of the screen to begin the process.

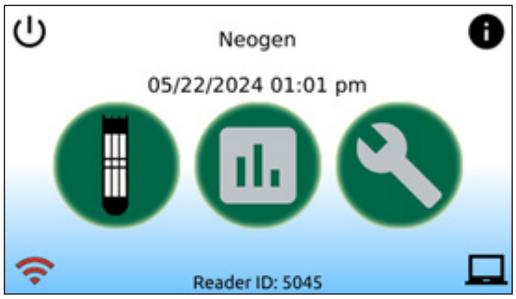


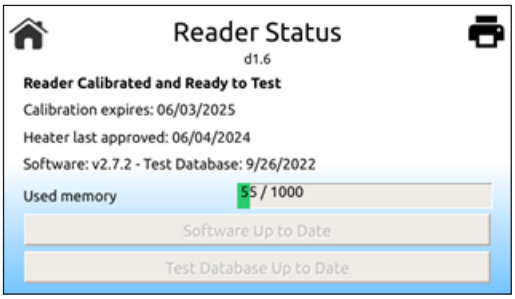


- Reader ID – identifies the Instrument in data manager reports.
- Network connection – the reader is Wi-Fi enabled to allow for remote updates and data transfer.
- Operating system power button – select the power down button on the top left-hand corner of the home screen to prepare the system for shutdown.
  - Select Shut Down, or Restart; follow on screen instructions for proper shutdown of the instrument.



- Instrument Information – select the icon in the upper right corner of the home screen to access the current status of the reader.



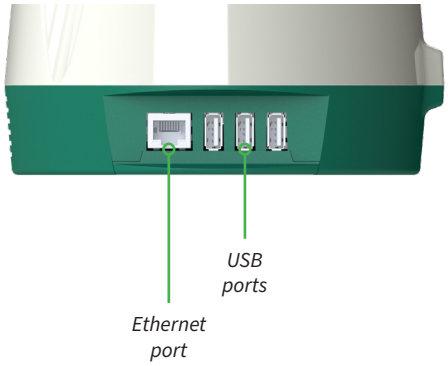


Updating the Instrument

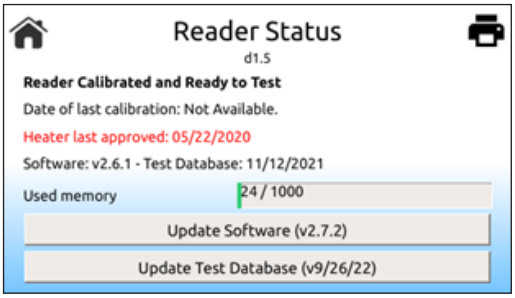
The instrument will require software and test database updates as new features, assays, or test information is added. The instrument can be updated either wirelessly or by using a USB flash drive.

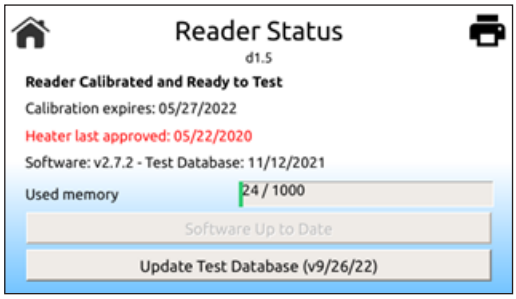
USB Update

- Plug in a USB flash drive with update into an available USB port on the left side of the instrument.



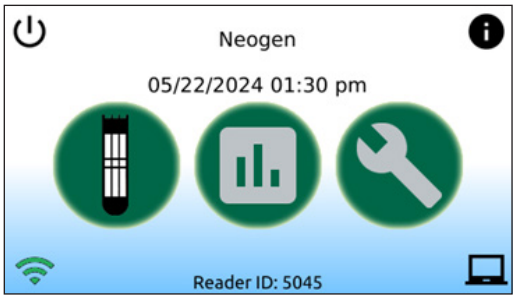
- The USB drive will be scanned by the instrument.
- If a newer update is identified, a button will appear for both a software and test database updated depending on the files included on the attached USB drive.
- Install each update by selecting the button on the screen. (Once updated, the selection will be greyed out).

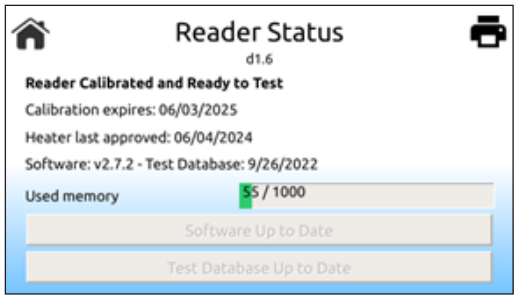




Network Update

- Ensure the Raptor is connected to a network. Icon in the lower left-hand corner should be green.
- The instrument will contact the Neogen File Transfer Protocol (FTP) server to check for updates.
- When a new update is available, the button will display for updates.
- Install each by selecting the available button on the screen.





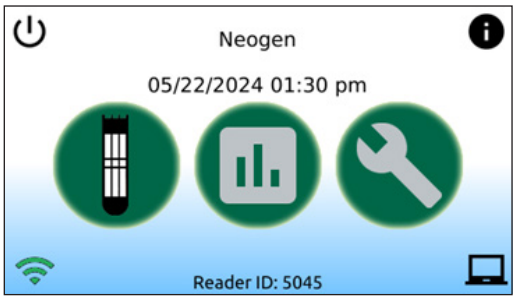
Dilution Factor

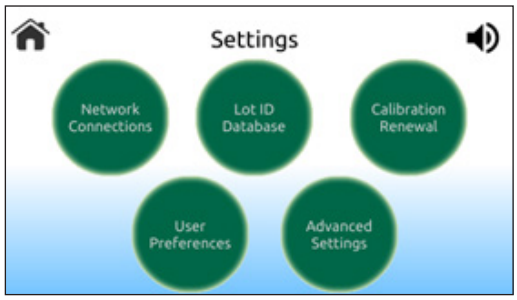
The dilution factor feature adds the dilution that you prepare offline to the results, so the calculation is completed and shown on the final result screen. This result can then be transferred to your data analysis program.

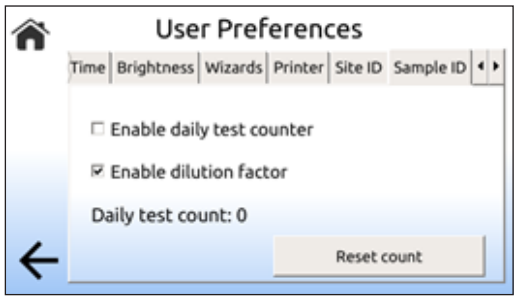
The feature must be enabled in order to access the screeens needed.

Enabling the Dilution Factor

- From the Main menu, select the Settings icon.
- From the Settings menu, select User Preferences.
- From the User preferences menu, press the Sample ID (use arrow to navigate to this tab).
- Check the enable dilution factor box.
- Press the Home icon to return to the main menu.

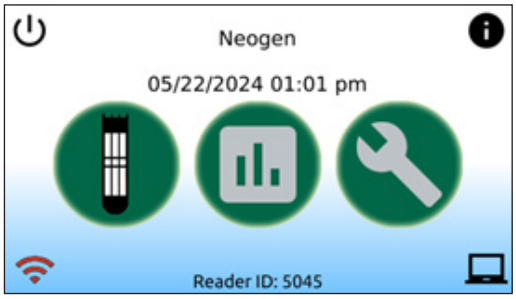


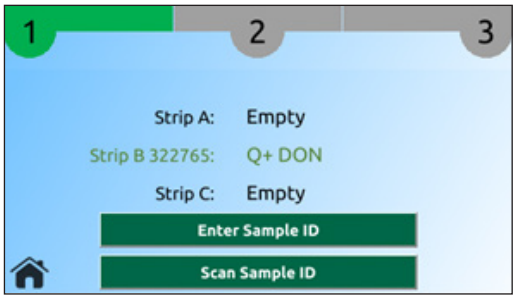


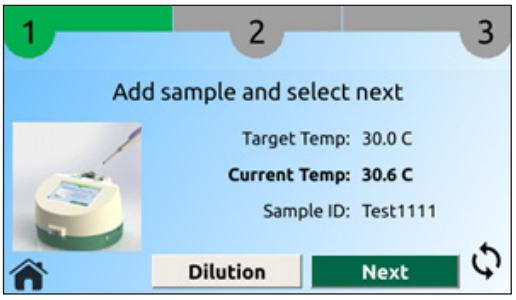


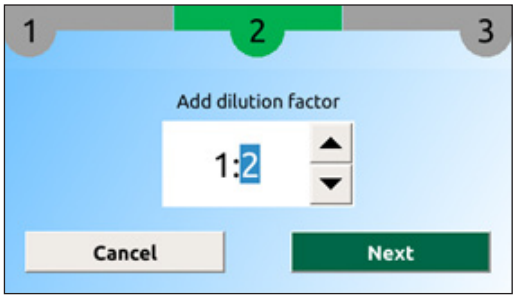
Running an Assay with Dilution Factor Enabled

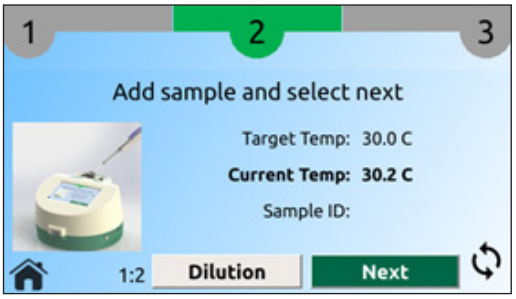
- From the main menu, press the results icon on the left hand side of the screen. The instrument starts the run test routine providing step by step instructions.
- The three numbered tabs at the top of the Insert Cartridge screen indicate which part information is being displayed.
  - Toggle to the desired port by pressing 1, 2 or 3.
    - Each port can test a single sample and can run simultaneously and independently of the other two ports.
  - Insert a test strip into the cartridge and place into one of the ports.
    - The insrument recognizes a cartridge has been inserted and will scan the device found within the cartridge.
    - The test strip barcodes are indentified.
      - Test information is linked by the barcode on the test strip.
    - If the instrument does not have the lot-specific information, the barcode scaner will turn on for the QR code (located on the test strip tube) to be scanned.
      - Hold the tube contaiining the lot-specific QR code within the scanner range. The instrument will accept the data and display the lot number of the test strip in the cartridge.

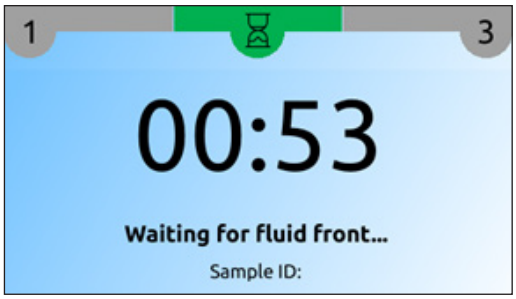


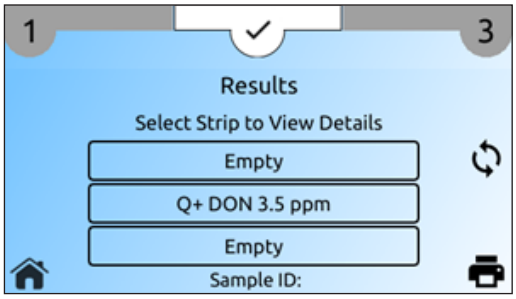


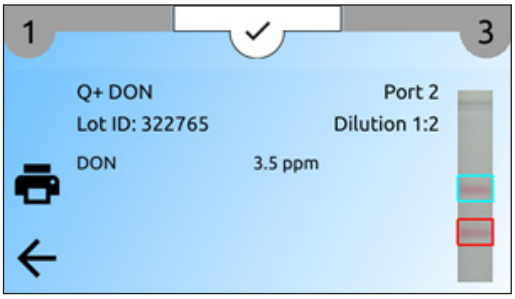






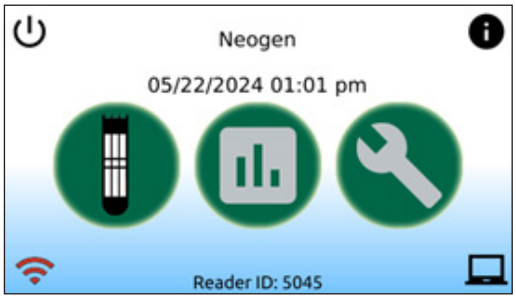




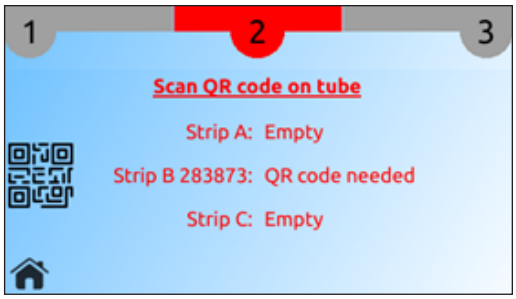


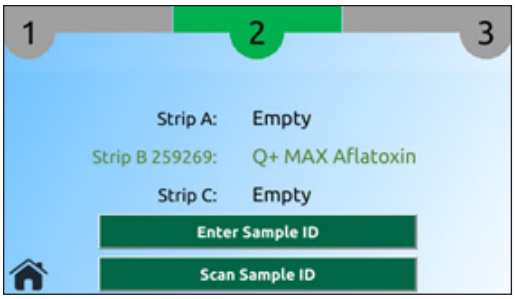
Running an Assay

- From the main menu, press the results icon on the left hand side of the screen. The instrument starts the run test routine providing step by step instructions.
- The three numbered tabs at the top of the Insert Cartridge screen indicate which part information is being displayed.
  - Toggle to the desired port by pressing 1, 2 or 3.
    - Each port can test a single sample and can run simultaneously and independently of the other two ports.
  - Insert a test strip into the cartridge and place into one of the ports.
    - The instrument recognizes a cartridge has been inserted and will scan the device found within the cartridge.
    - The test strip barcodes are indentified.
      - Test information is linked by the barcode on the test strip.

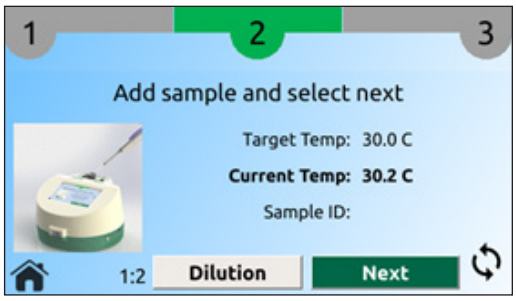


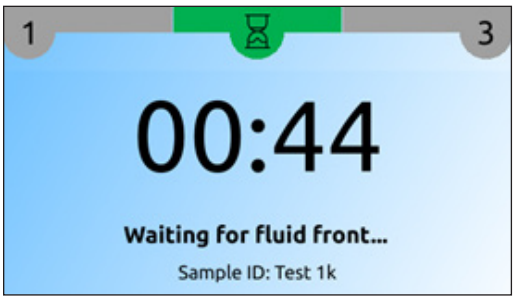
  - If the instrument does not have the lot-specific information, the barcode scaner will turn on for the QR code (located on the test strip tube) to be scanned.
    - Hold the tube contaiining the lot-specific QR code within the scanner range. The instrument will accept the data and display the lot number of the test strip in the cartridge.
  - The Scan Sample ID screen allow you to san a barcode on your sample. If you do not have a barcode, you can manually enter the information by selecting Enter Sample ID and using the keypad to enter the ID. Press Accept to move to the next step.
    - The sample size is always 400 µL whether running 1 test strip, or up to 3 test strips in the cartridge.



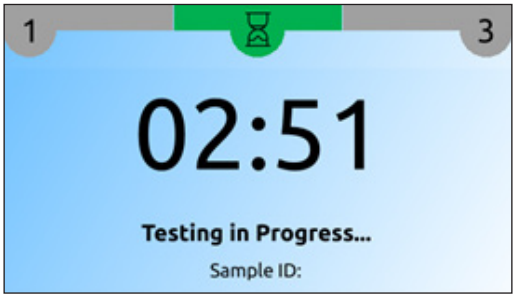


- Add the sample to the cartridge.
  - Using a pipette, collect 400 µL of sample and carefull dispense into the funnel shaped opening at the top of the cartridge.
    - Note: you must dispense the sample in one aliquot (do not use a smaller unit pipettor and dispense several times).
  - Press the Next button. The instrument will automatically wait for the fluid front to be detected and then start the timer for the assay.
    - Each test has a specific run time that must elapse before results can be analyzed by the instrument.
    - The timer on the screen indicated the remaining test time.
- You can start additional tests by selecting an open port and repeat the running an assay protocol for that port.

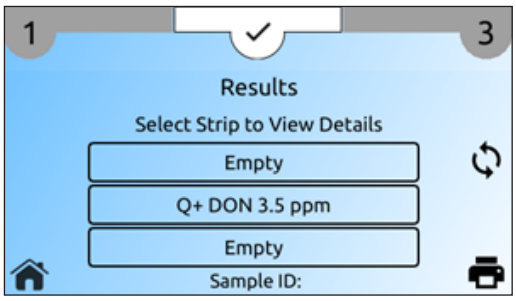


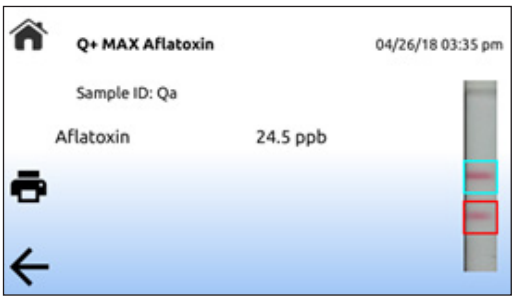


- Once the specified time has elapse, the reaer will automatically capture an image of the strip and analyze and display the results.



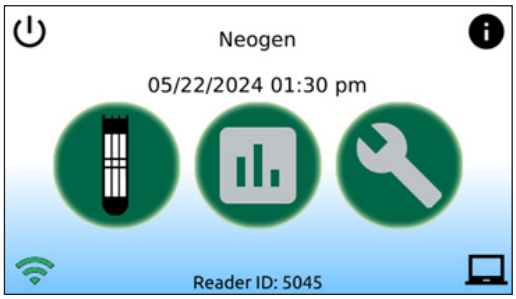
- Results screen
  - After the strips in the cartridge are analyzed, the overall sample port results screen is displayed. An audio one will sound, and all result information is saved on the reader. If auto-print is enabled, the result will automatically print.
  - Click on the strip for more detailed result information including the strip image.
  - Results can be manually printed from either screen by pressing the printer icon.

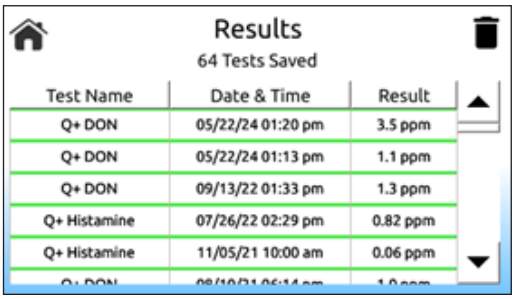




Viewing Results

Select the Results icon in the center of the home screen to view the results of previous strips stored on the instrument.





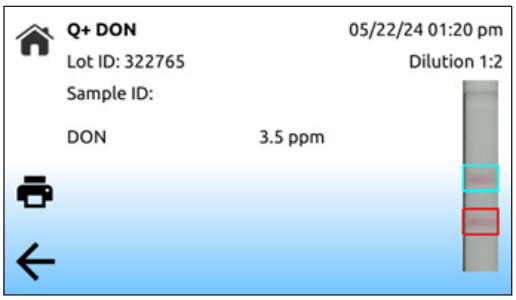
The results screen reports each test strip individually. The information displayed for each strip includes:

- Test strip type
- Date and time the assay was completed
- Test result

The list of results can be sorted by any of these three categories.

- Tap on the column header to sort the results.

Select an individual result line to bring up additional test strip information.



Data Manager

The Data Manager software may be installed on Windows and Mac Operating Systems. Data Manager is compatible with Windows 7 and above operating systems.

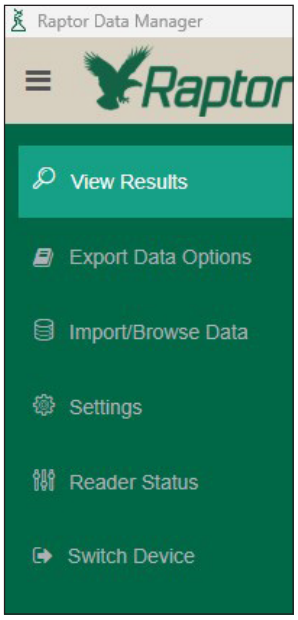
Home Screen

The launch of the software will display the home screen featuring an animation and a link to the Neogen software license agreement.

- Select the Raptor Data Manager icon from your desktop screen to continue.

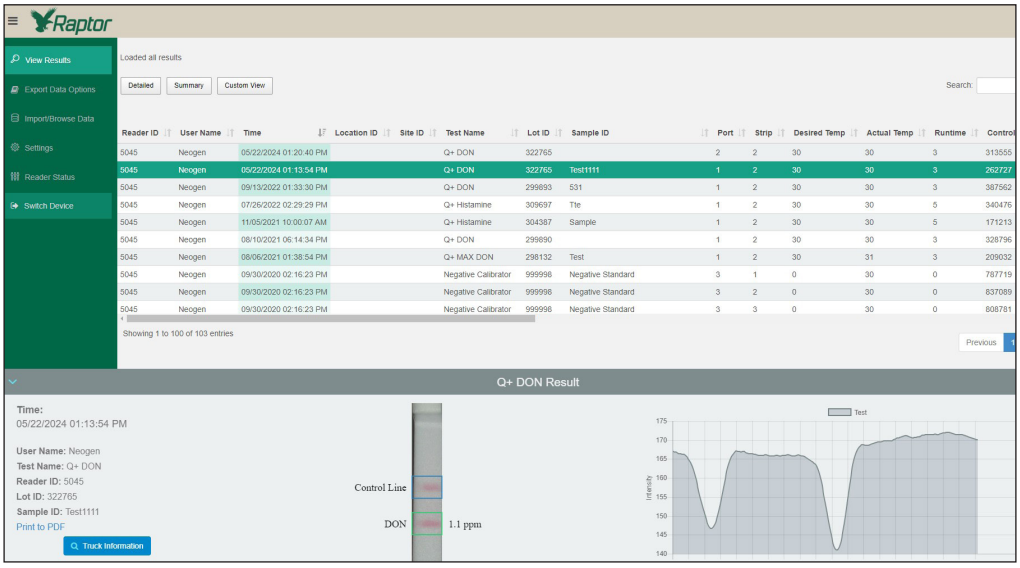
- Select Raptor.

- The Side Menu has 6 options:

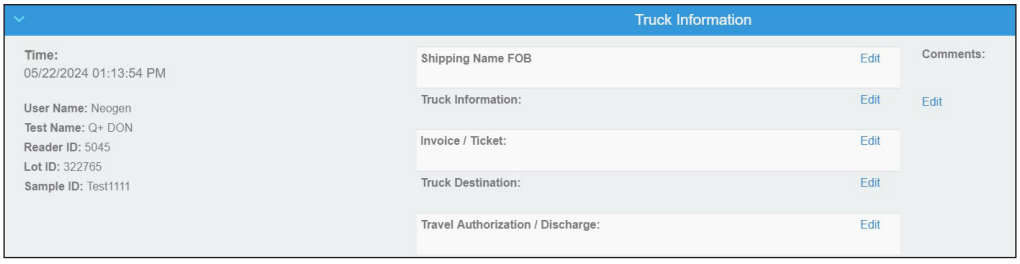


View Results

- The results screen can be configured using these options:
  - Detailed view-shows all parameters selected.
  - Summary view- shows limited parameters.
  - Custom view – allows you to choose what information shows on the views.
- There is a search tool that will query the test data base for information of interest on the top right-hand corner of the screen.
- Data can be sored in ascending or descending order for each column by clicking on the column title.
- Select a data row for a specific result to get a detailed test view in the lower half of the screen.



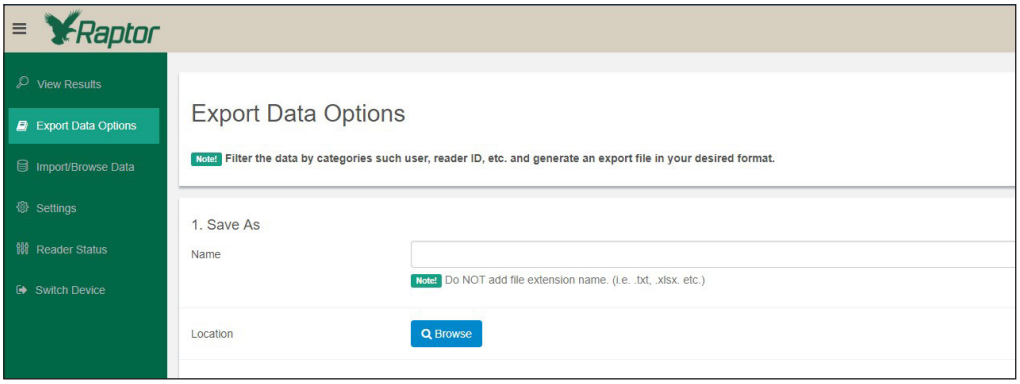
- Contains an image of the device.
- Test information and graph of test and control line intensity values.
- Truck Information tab (if enabled in the settings menu).
  - Allows you to enter information on the transport truck.
    - Shipping Name FOB
    - Truck Information
    - Invoice/Ticket
    - Truck Destination
    - Travel Authorization/Discharge
    - Comments



Export Data Options

Data can be exported in common file formats for further analysis or integration into Laboratory Information Management Systems (LIMS).

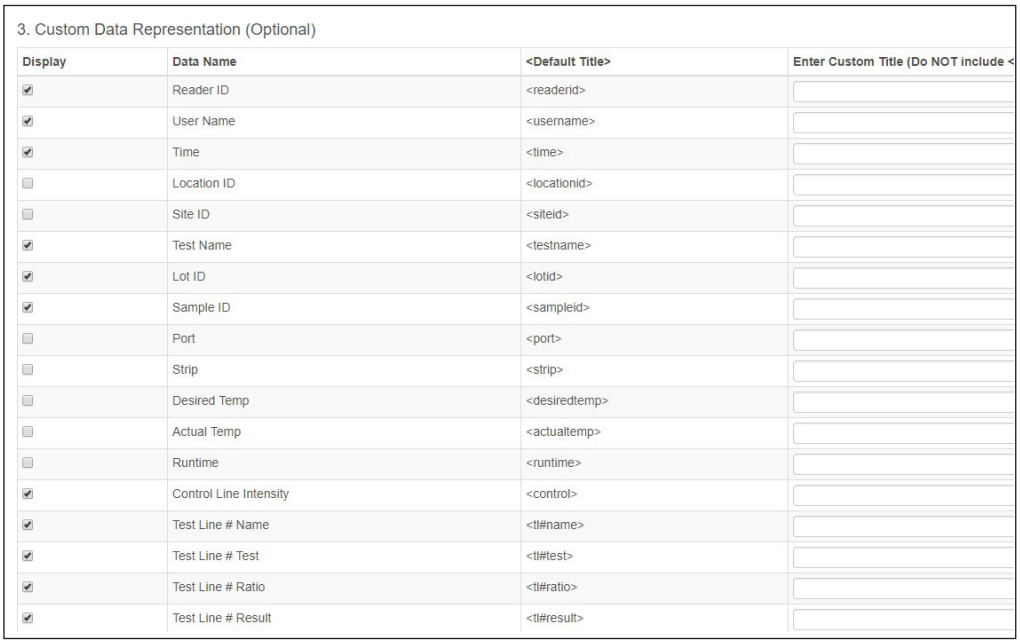
- Select the destination location for the file export and name the export file.
  - Note: do not add a file extension at this point of the process.



- Filter Data
  - Date range filters and specific category filters can be applied prior to export.

- Custom Data Representation (Optional)
  - This feature allows the field name to be changed prior to export to comply with the original data model used – (for example Username may be User ID in your system).

- In the Display column, select the results that will be transferred to the new file location.



3. Custom Data Representation (Optional)

Display	Data Name	<Default Title>	Enter Custom Title (Do NOT include <
☑	Reader ID	<readerid>	
☑	User Name	<username>	
☑	Time	<time>	
☐	Location ID	<locationid>	
☐	Site ID	<siteid>	
☑	Test Name	<testname>	
☑	Lot ID	<lotid>	
☑	Sample ID	<sampleid>	
☐	Port	<port>	
☐	Strip	<strip>	
☐	Desired Temp	<desiredtemp>	
☐	Actual Temp	<actualtemp>	
☐	Runtime	<runtime>	
☑	Control Line Intensity	<control>	
☑	Test Line # Name	<tl#name>	
☑	Test Line # Test	<tl#test>	
☑	Test Line # Ratio	<tl#ratio>	
☑	Test Line # Result	<tl#result>	

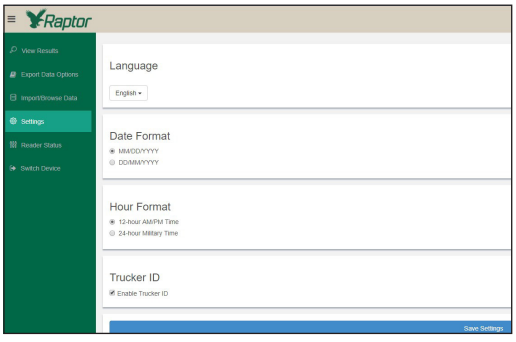
- Export Settings
  - Defines the frequency of the export, the file types, and how data is separated for certain file times.
    - Note: real-time export can only be used with Network Data Transfers.

Once the selections have been made, the settings may be saved by selecting Save Export Settings.

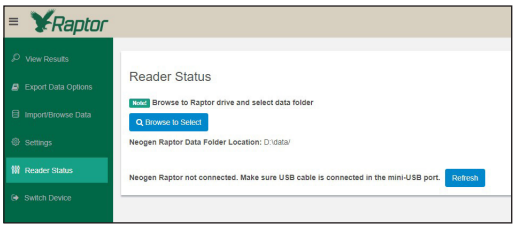
Data may be exported by Selecting Export Now.

Settings

- Language, time, and date preference can be configured within this menu.
- Enabling the Trucker ID allows extra information to be entered per sample.



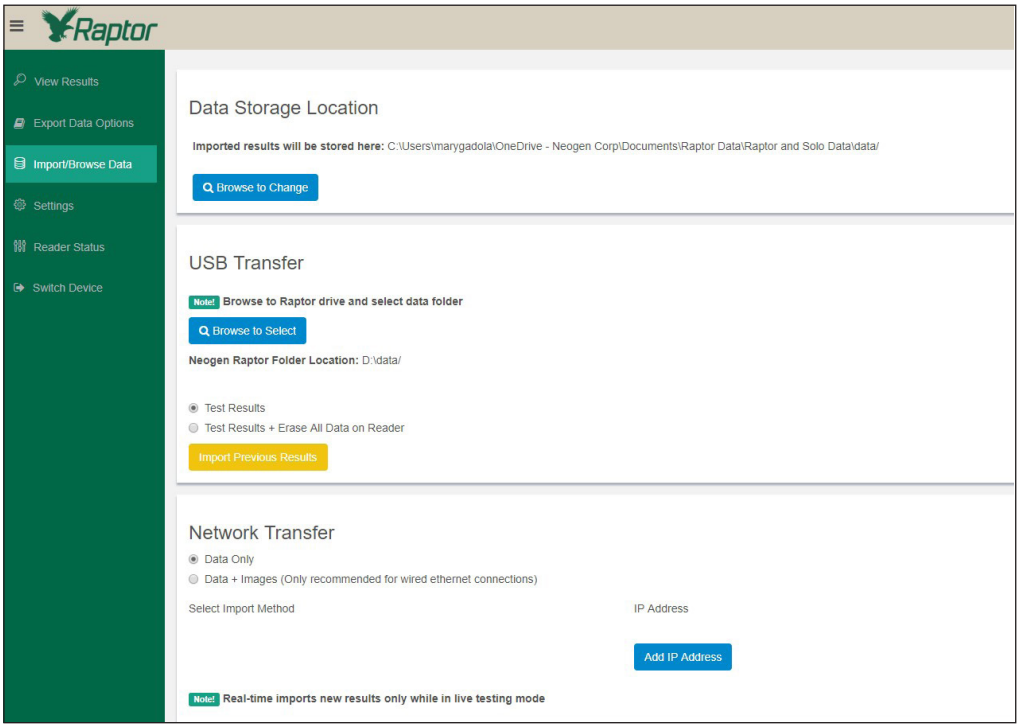
Reader Status



Switch Device

Brings you back to the main menu to select either Raptor or Raptor Solo.

Import/Browse Data



Data Storage Location

- Select the destination folder by selecting the Browse button.
  - Choose an existing folder or create a new folder.
    - This is where the data files will be stored.
  - A network folder must be selected as the destination folder.

USB Transfer

- Import via the USB cable is another option to transfer the data to your computer.
  - Connect the mini-USB cable (supplied with the instrument) to your computer.
  - Make sure your computer and the instrument are turned on.
  - Ensure the instrument is in Data transfer mode by selecting the computer icon on the lower right-hand corner of the home screen.

- The instrument will be recognized as a mass storage device – select Do Not Scan to continue.
- Select the Browse to Select button to choose the source folder.
  - Note: the D:Raptor/data folder must be selected to continue.
- Choose Test Results or Test Results + Erase all Data on Reader.
- Select the Yellow Import Button.
  - A progress bar will display import progress.

Network Transfer

- Import via Network connection will transfer data through a wired network connection.
  - Identify the unique IP address for the instrument by selecting the wireless icon on the screen of the instrument.
  - Enter the IP address for the instrument.
  - Select Import to transfer data from the instrument.
  - A progress bar will display import progress.

Troubleshooting

For technical support

Neogen Corporation
620 Lesher Place
Lansing, MI 48912 USA
(800) 234-5333 (USA)

Maintenance

General Care

- This device contains sensitive electronic and optical components and must be treated with care.
- To clean the touchscreen on this device, wipe it gently with a soft cloth. Avoid using any liquid solvents to clean the screen.

Spills

- In the event that sample is spilled in the instrument, turn off the device and carefully remove any sample cartridges. Keep the instrument upright and allow any excess liquid to drain out of the holes at the bottom directly below the port openings. Wipe up the liquid from under the reader with a cloth. For any remaining liquid inside the device use a long cotton swab to clean the internal incubators.
- For minor spills on or around the exterior of the device, wipe away any liquid quickly. Ensure no liquid has come into contact with any external ports or buttons before proceeding.
- For more severe spills, contact your Neogen representative.

Technical Specifications

Power

- Main input to power supply - 100–240 V~, 50/60 Hz, 1.7A
- Input to device - 12 volt DC, 40 W

Size

- 0.64 kg
- 18.5 cm width x 10.8 cm height x 16.9 cm depth

Safety Information

Service

- This instrument has no user serviceable parts and must be returned to Neogen for service.

Power

- To power the instrument, assemble the power cable by connecting the desired regional power adapter to the power supply. Plug the AC line into an outlet and insert the plug into the instrument.
- This instrument should be on the lab bench so that the main power supply is not inadvertently disconnected during operation.
- Components such as power supply and built-in information technology equipment shall be used in accordance with their specified ratings unless a specific exception is made.

Design Conditions

- Indoor use only
- Altitude up to 2,000 m
- Temperatures 5–40°C
- Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C.
  Note: If this instrument or any of its associated parts are used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.

Warranty

The Raptor Integrated Analysis Platform carries a 12-month limited warranty on defective materials and workmanship. Buyer assumes all risk and liability resulting from the use of this product. There is no warranty of merchantability of this product, or of the fitness of the product for any purpose. Neogen shall not be liable for any damages, including special or consequential damage, or expense arising directly or indirectly from the use of this product.

NEOGEN®

Neogen Corporation, 620 Lesher Place, Lansing, MI 48912 USA.