InfraLab® TL Series 9

User Guide

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Issue C

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Proprietary Notice

InfraLab TL Series 9 User Guide

Part Number: 126/17382-01 (5026769)

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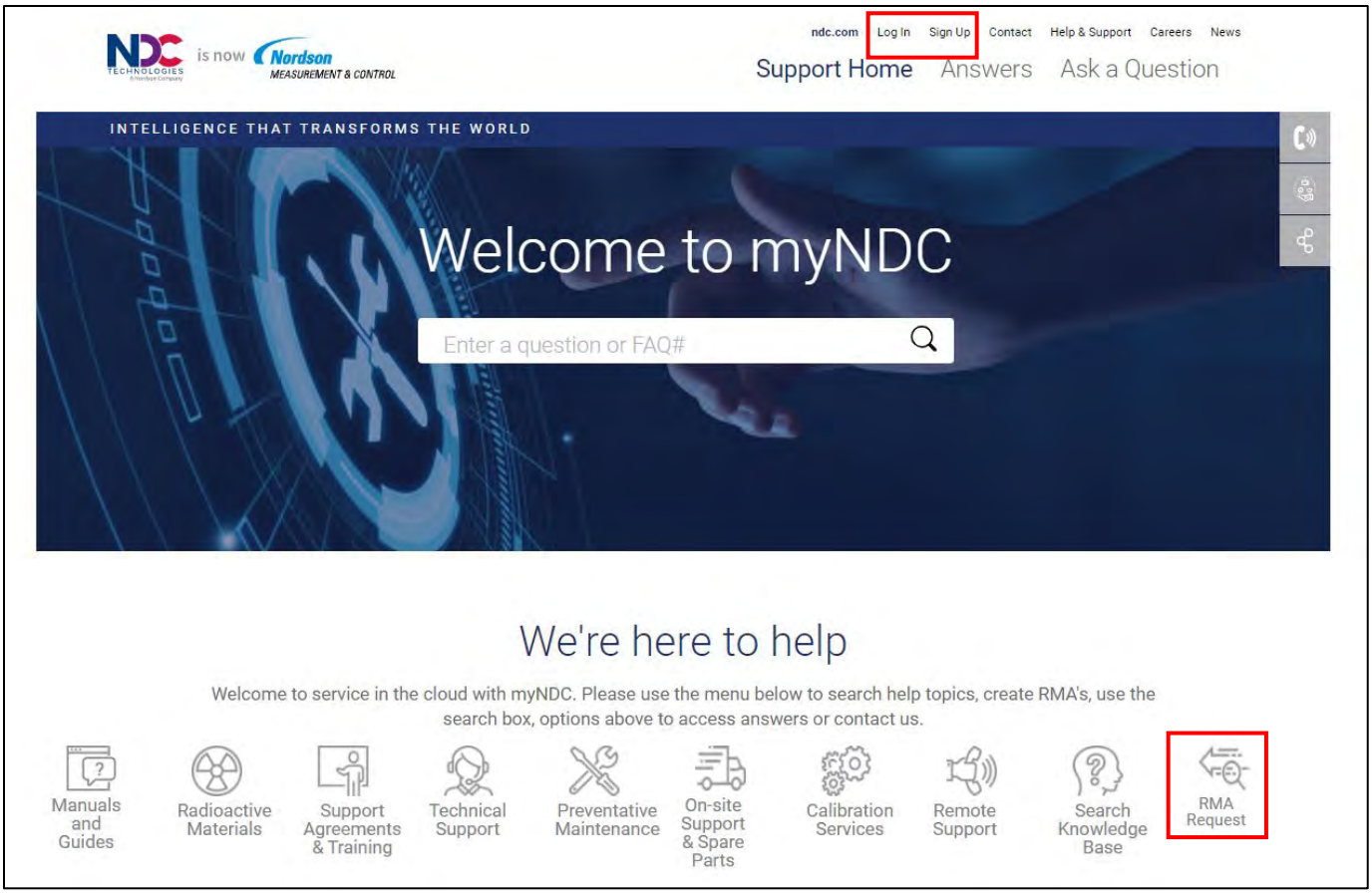

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CHAPTER 1

1 Introduction

1.1 About This Manual

This manual describes the installation, operation, calibration and maintenance of the InfraLab TL Series 9. It is intended for use by installation personnel, suitably-qualified maintenance staff and trained operators.

As an aid to using this manual for installing and setting up the InfraLab TL, the following Quick Setup Guide has been provided, giving the essential steps and links to the sections that describe them.

1.2 Quick Setup Guide

The InfraLab TL Series 9 is designed for ease of installation and setup. Just perform the key steps in the order given below.

1. Install the InfraLab TL (see Chapter 4 - Installation).

   When the unit is powered on, the Configuration Wizard will launch for setting up the InfraLab TL. See Section 4.6.1 - Configuration Wizard.

   You might need to read the Overview (see Section 5.1 - Overview) and Data entry (see Section 5.2 - Data Entry) information in the Operation section before performing the following setup actions on the control panel.

2. Select the user language (see Section 6.7 - Local Settings).

3. Check that no error messages are displayed on the InfraLab TL control panel (see Section 5.1.3 - Responding to Error Messages).

4. Rename the InfraLab TL and measurement channels from the factory defaults as desired (see Section 6.9 - Editing the Gauge and Measurement Names).

5. Reference the InfraLab TL (allowing for a 2 hour warm up time first) (see Section 7.2.3 - Internal Referencing the Analyser).

6. Create a Product recipe (see Section 6.6.1 - Creating a New Product).

7. Select the Product recipe (see Section 6.5 - Loading Products).

8. Auto-trim the InfraLab TL to the desired reading (see Section 7.2.1 - Using Auto-Trim).

9. Check and if necessary, adjust the InfraLab TL trim value against laboratory reference values (see Section 7.2.2 - Trim).

10. If there is a wide measurement range, perform a full-range calibration (see Section 7.2.4 - Performing Full-Range Calibration).

1.3 Associated Documentation

The following documents are associated with this manual:

- **Packaging Sheet** - detailing all dispatched items, for use as a delivery check list
- **Best Practice Guide** available for download from Nordson Service Cloud at https://ndc.custhelp.com - providing:
    - Sample preparation, presentation and InfraLab TL settings
    - Measurement applications codes
    - Calibration recommendations
- **InfraLab Manager PC Software Guide**, available for download from https://ndc.custhelp.com
- **LIMS Connectivity Guide** (optional, part number 126/16915-01), available for download from https://ndc.custhelp.com

1.4 Contact Information

For enquiries relating to the operation and use of the equipment described in this manual, please refer to www.ndc.com, or the Contact section at the beginning of this manual, for company contact details.

CHAPTER 2

2 Safety Information

2.1 Warnings

- To avoid the risk of electric shock, isolate the mains supply to the equipment before carrying out any maintenance or repair work.
- To avoid the risk of burns, allow hot items to cool before attempting any maintenance or repair work.
- The InfraLab TL contains mains potentials and items that rotate at high speed, which could cause injury. Do not operate the InfraLab TL unless it is fully assembled.
- To avoid a potential safety hazard by using an underrated mains cable, only use the detachable mains cable supplied with the equipment.
- If the InfraLab TL is not installed and used in the manner prescribed in this manual, the safety protection afforded by the equipment may be impaired.

2.2 Cautions

- The InfraLab TL contains static-sensitive devices. During maintenance or repair, observe standard electrostatic precautions to avoid damaging the equipment.
- Clean the InfraLab TL window and external equipment surfaces with clean non-abrasive materials only, in accordance with the cleaning instructions (see Section 8.3.1 - Cleaning the InfraLab TL Windows). If in doubt, contact Nordson.
- The light beam emerging from the top of the unit is approximately 28 mm in diameter and diverging with an optical power that is perfectly safe. However, avoid looking directly into the beam as this will cause some discomfort as if looking into the headlights of a car.

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CHAPTER 3

3 General Description

The InfraLab Top Loader (TL) is part of a family of Series 9 InfraLab products that can be used in both the laboratory and at-line environments for quick analysis of samples taken from the process.

The unit uses both IR and VIS light as part of the analysis. It can measure multiple components of the sample presented in a static or rotating sample holder, with moisture and colour as typical measurement examples.

Please refer to Nordson's best practice guides for the intended application for advice on sampling and calibration techniques.

The InfraLab TL supplied comprises the following items:

- Main control unit with integral display and touch screen controls
- Rotating sampling cassette
- Static sample plate
- Memory stick
- 2m Ethernet patch cable
- Set of universal mains supply cables
- Accessory case, containing a sample holder/lid and reference standard

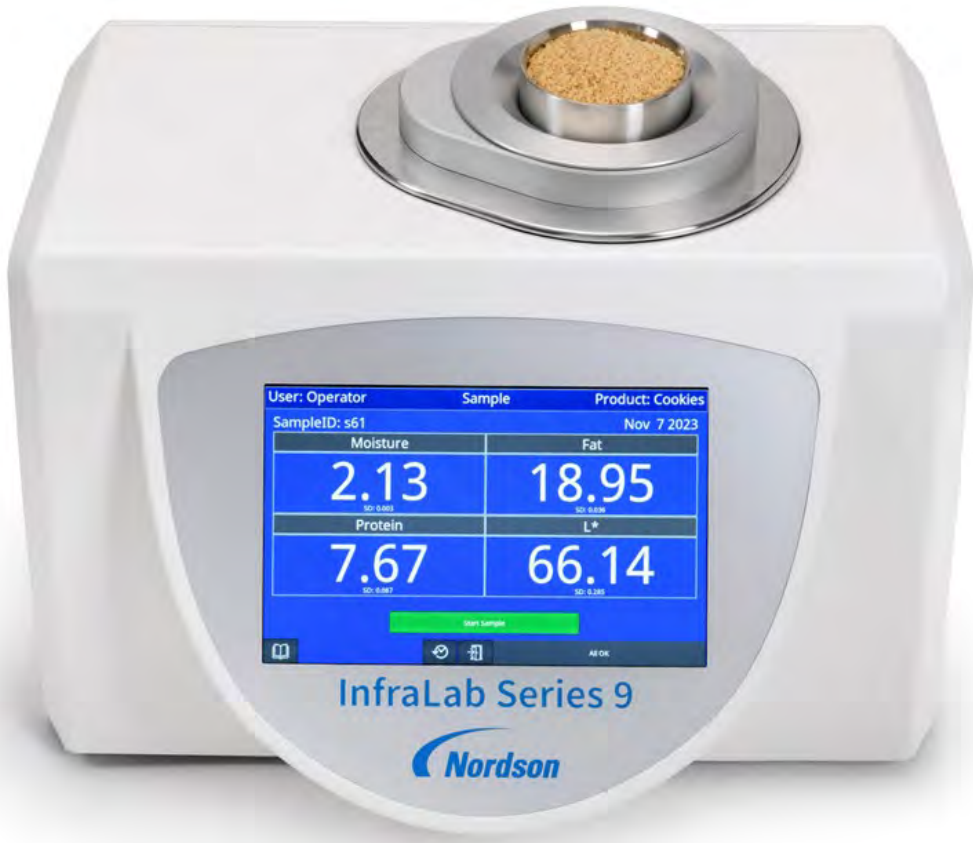

Figure 3-1 InfraLab TL Series 9 analyser

The InfraLab TL includes a number of unique features that provide enhanced performance, as highlighted below.

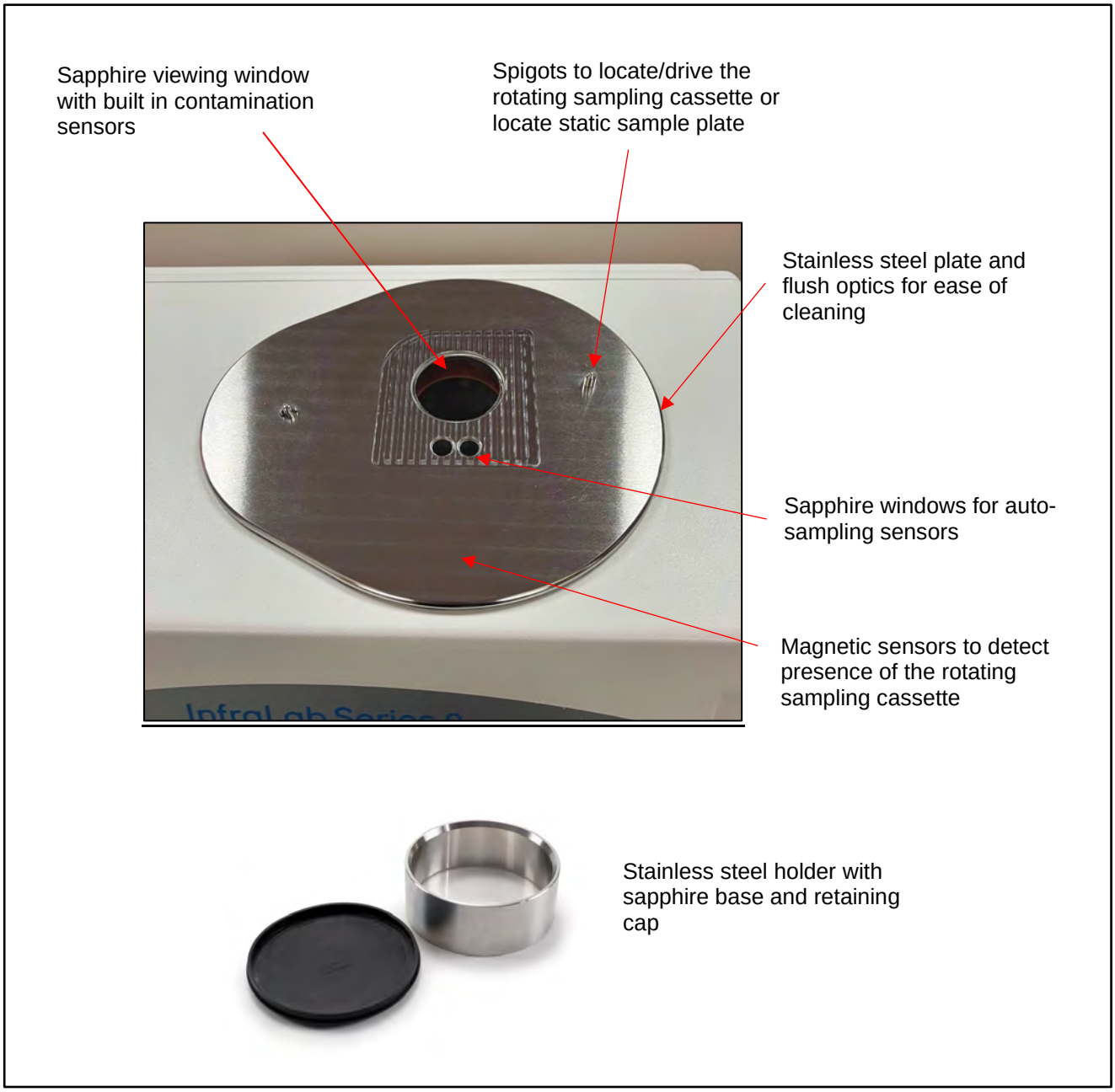

Figure 3-2 InfraLab TL features

InfraLab TL Series 9 has been designed and constructed for use in product processing environments and laboratories. It can measure an extensive range of constituents in a variety of materials. Up to six constituents of a product can be measured simultaneously. The InfraLab TL provides rapid and accurate multi-component analysis of products at any selected stage of production.

Operating as a stand-alone unit, the InfraLab TL runs under the control of embedded firmware. However, it has Ethernet facilities which enable it to be integrated into a network or information management system, and/or communicate with a PC running InfraLab Manager software. It also has two USB ports, one located on the right side, and the other at the rear, for connection to local devices such as flash memory sticks and a barcode reader.

Figure 3-3 Flash memory stick connected to InfraLab TL

3.1 Features

The InfraLab TL Series 9 offers a wide range of features, including:

- On-board storage of up to 10,000 sample files (single or multi-component measurements)
- Ability to store up to 200 Product Definitions
- Automatic history of calibration changes for tracking and audit purposes
- Ability to register up to 200 users each with personalised security/access levels
- Integrated Auto Reference Standard for stability checking and confirmation
- Range of two different bowl types optimised for the nature and size of samples
- Full USB interfacing for memory storage and use with a barcode reader
- Simple intuitive operator interface with multi-lingual capability using LCD touch screen display

- User security protocol for protected access for operator and supervisor levels
- LIMS connectivity
- Integral Window Contamination Monitor (particularly relevant for at-line use in a production environment)
- InfraLab Manager software, downloadable from https://ndc.custhelp.com, as a facility for displaying, logging, analysing and exporting data collected by the InfraLab TL.

3.2 Principles of Measurement

The InfraLab TL Series 9 works on the principle that different product constituents absorb Near Infrared (NIR) light at specific wavelengths. NIR light at these wavelengths is emitted from the light source in the InfraLab TL (often referred to as the 'Gauge'), and the amount of reflected light from a sample of the product is accurately determined. From this, the InfraLab TL generates outputs that are directly proportional to the amount of each measured constituent in the product.

Product samples are placed in a sample holder on the top of the instrument, which rotates to allow an averaged measurement to be obtained.

3.3 Applications

The InfraLab TL Series 9 is factory-configured for the application specified at the time of ordering. Please refer to the Best Practice guide (downloadable), for information on the applications supported by the supplied unit, as well as general information about sample preparation, InfraLab TL configuration and calibration.

3.4 InfraLab Manager Overview

InfraLab Manager is a dedicated display, analysis and calibration software tool supplied with the InfraLab TL Series 9. It runs on Windows-based computers, and provides convenient facilities for displaying, logging, analysing and exporting data collected from individual or multiple InfraLab TL analysers.

In a networked configuration, InfraLab Manager provides the ability to view real-time measurement data from all connected InfraLab TLs, and can also compute and upload new calibration settings to the InfraLab TLs when necessary.

InfraLab Manager may also be used offline, in which case, previously collected analyser data can be loaded for display from stored files.

For detailed information on installing and using the application, please refer to the separate InfraLab Manager User Guide.

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CHAPTER
4

4 Installation

4.1 Installation Good Practice

Observe the following points when selecting the mounting location for the InfraLab TL analyser:

- **Product View**

  Install the analyser at a location where samples that are representative of the product at the relevant stage in the process can be collected and analysed with minimum delay (see Section 4.6 - Installing the InfraLab TL).

- **Site Requirements**

  Check that the mounting position and available services conform to the Site Requirements (see Section 4.2 - Site Requirements).

- **Analyser Support**

  Ensure that the analyser support is a rigid and flat surface, free from vibration during normal operation.

- **Atmospheric Contaminants**

  Ensure that the analyser is protected from high levels of airborne contaminant (e.g. dust and dirt).

- **Electromagnetic Compatibility**

  Follow the EMC precautions to avoid interference from other equipment (see Section 4.3 - EMC and Environmental Precautions).

- **Ambient Light**

  Shield the analyser window and measuring area from direct sunlight, as this may affect the sensitivity of measurements.

4.2 Site Requirements

The installation site for the InfraLab TL should meet the following environmental and supply requirements.

Environmental

Operating temperature range	0°C - 50°C
Relative Humidity	5% - 80% (non-condensing) over the full operating temperature range

Electrical

Mains supply	90 to 264V~, 47 to 63Hz, 100W

4.3 EMC and Environmental Precautions

The following applies to the InfraLab TL analyser:

- Indoor use
- Up to 2000m altitude
- MAINS supply voltage fluctuations ±10%
- Overvoltage category 2
- Pollution degree II
- Not for wet locations

Use the following guidelines for electrical precautions, and to minimise the effects of electrical interference.

1. Proper earthing is ensured when the customer uses the appropriate power cable for their country.
2. Ensure that the system is supplied with a clean mains supply (instrumentation supply).
3. Place the system in a position for easy disconnect.

4. Ensure that the InfraLab TL analyser and associated cabling are placed away from sources of strong EMI (Electromagnetic Interference). Example sources of EMI:

    - Large electric motors
    - Welding equipment
    - Large static discharges
    - Infrared ovens
    - Microwave ovens
    - Large transformers
    - Transmitters
    - Power control circuits

    For advice or help on installation concerning EMC, please contact the Customer Care Helpdesk at Nordson.

4.4 Unpacking

1. Check against the courier's Delivery Note that all listed items have been delivered.
2. Unpack all equipment in a clean area. Retain the packaging for future use, if possible.
3. Retrieve and keep the documentation included in the packaging:

    Packing Sheet - which lists all supplied items

4. Check the equipment carefully for any signs of damage.
5. If any items are missing or damaged, notify the carrier, Nordson or the agent of Nordson (see Section 1.4 - Contact Information) as appropriate.
6. If there are any discrepancies, notify Nordson or the agent of Nordson (see Section 1.4 - Contact Information).
7. If the equipment is to be stored prior to installation, ensure that the storage conditions are suitable (see Section 4.5 - Storage).

4.5 Storage

Before installation, store the equipment in the environmental range:

Temperature	-20°C to 70°C
Humidity	5% - 95% (non-condensing)

Include desiccant if there is any possibility of condensation. After storage, allow the equipment to reach ambient temperature before installation.

4.6 Installing the InfraLab TL

Installation of the unit is straightforward.

Place the InfraLab TL on the prepared surface.

1. Where relevant, connect the Ethernet cable.

2. Plug the unit into the mains supply using the appropriate mains cable for the region.

3. Switch on the InfraLab TL using the on/off switch on the rear of the unit.

   This will launch the Configuration Wizard for setting up the InfraLab TL. See Section 4.6.1 - Configuration Wizard. When done with setup, the main sampling screen will be displayed (Figure 4-2).

   Additionally, a Warming Up message may be displayed until the internal temperature has stabilised.

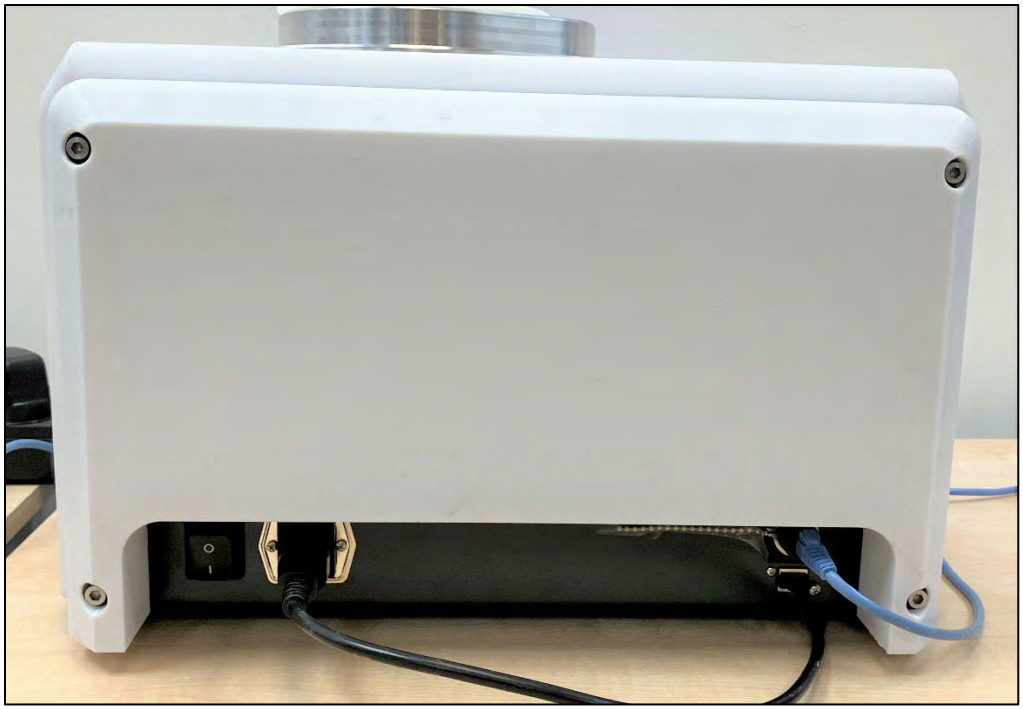

Figure 4-1 InfraLab TL rear panel

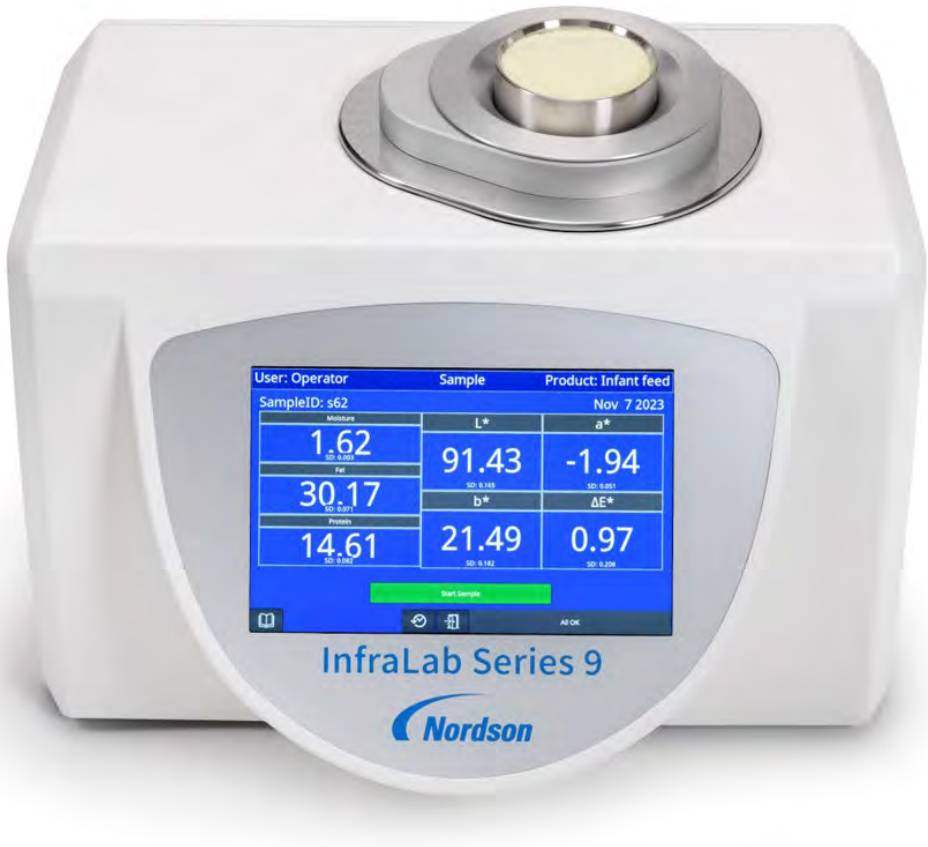

Figure 4-2 Main sampling screen

4. Where required:

    - Connect a USB barcode reader.
    - Configure a USB barcode reader (see Section 6.12.4.1 - Configuring Barcode Readers).

4.6.1 Obtaining the Application Unlock Code

An application unlock code is required to unlock the installed application configuration. Follow the procedure below to obtain this code:

1. Use the QR code

or the web address

https://ndc.custhelp.com/app/answers/detail/a_id/383

shown on labels at the front and rear of the unit to access the InfraLab Series 9 support website (Figure 4-3).

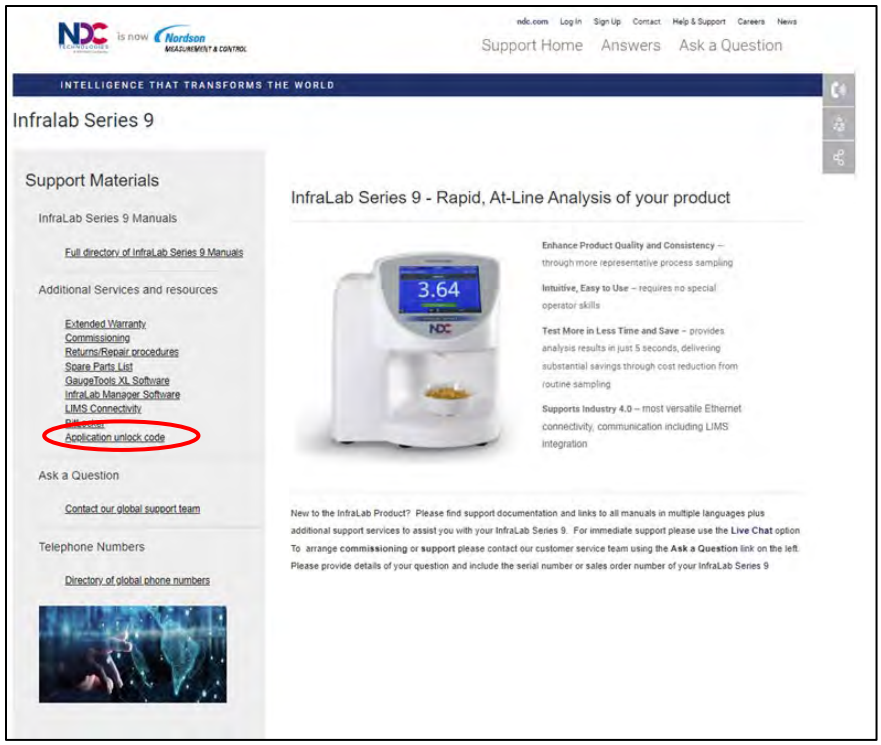

Figure 4-3 InfraLab Series 9 support website

2. Select **Application unlock code** from the left column to access the Unlock Code form (Figure 4-4).

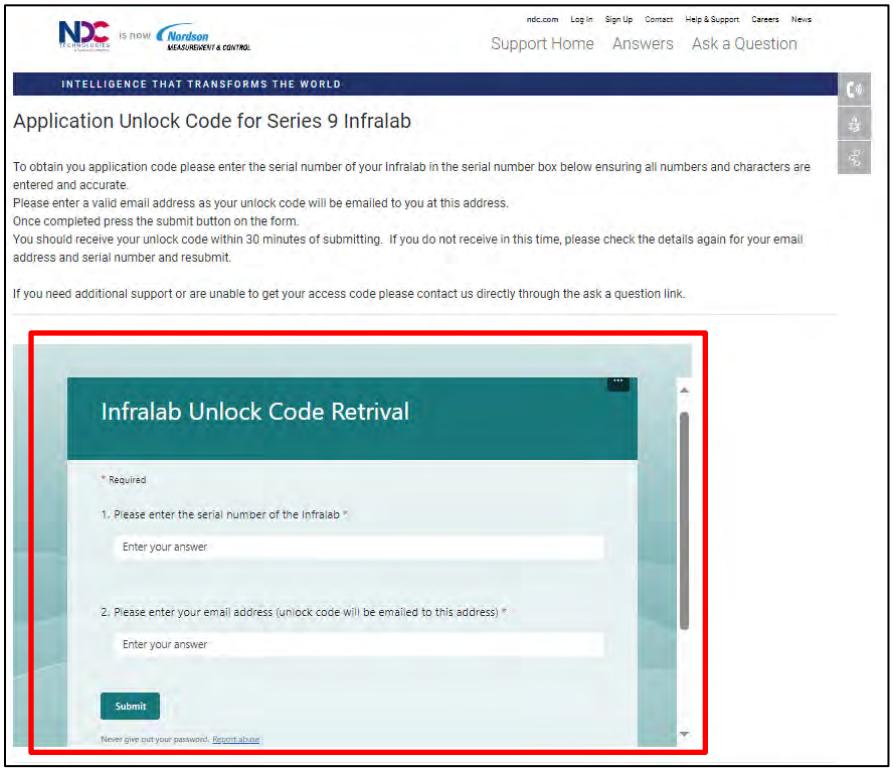

Figure 4-4 Unlock Code form

3. Enter the serial number found on the rear of the unit and your email address, then press **Submit**.

The unlock code will be emailed to you within 30 minutes of submitting. You will need to enter this code in the start-up screens of the unit to access the measurement applications that have been ordered. See Section 4.6.2 - Configuration Wizard. If you need assistance, please contact your customer care representative.

4.6.2 Configuration Wizard

When the InfraLab TL is first turned on, the Configuration Wizard will launch and automatically navigate the user through a sequence of setup pages to:

- Select the language. See Section 6.7 - Local Settings.
- Set the date/time. See Section 6.8 - Setting the Date and Time.
- Link the InfraLab TL control display and gauge. See Section 6.12.2 - Linking the Display.
- Unlock the application by entering the application unlock code that was obtained in Section 4.6.1 - Obtaining the Application Unlock Code. See Section 6.11 - Unlocking the Application.

Note: Some of the configuration steps may be skipped if the InfraLab TL is already configured. For example, if the InfraLab TL control display and gauge are already linked, then this setup step is skipped.

4.6.3 Fitting the Rotating Sampling Cassette

1. Locate and fit the rotating sampling cassette to the top of the unit, engaging the two spigots shown, ensuring that the serrated drive spigot is engaged with the serrated drive socket as shown on the left.

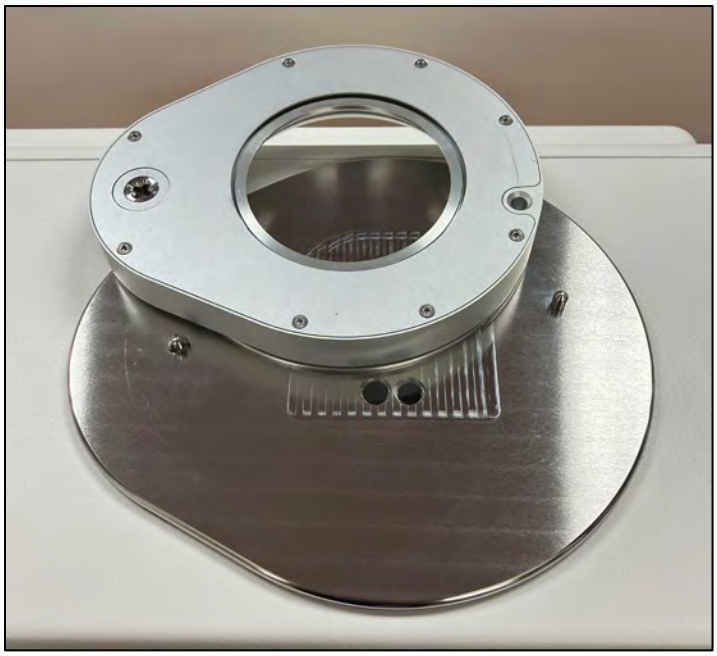

Figure 4-5 Fit the rotating sampling cassette

2. Rotate the holder by hand to ensure that its unit is fully engaged and seated down.

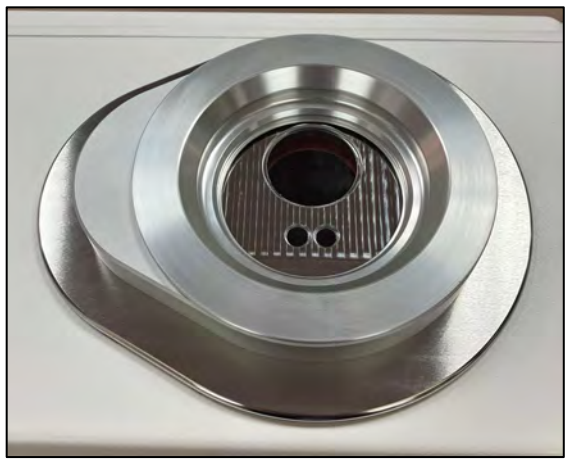

Figure 4-6 Rotate the holder

4.6.4 Using the Sample Cell

1. Locate the sample cell in the accessory case and remove its lid.

Figure 4-7 Sample cell in accessory case

2. Fill the cell with the sample to be measured, ensuring that the sample fully covers the base of the cell and is at least 10 mm in depth.

3. Place the sample cell into the centre of the rotating holder and ensure that it is seated down. The unit will then auto-sample (if enabled), rotating the sample for several seconds before the final measurement is displayed on the screen.

Figure 4-8 Place sample cell in rotating holder

4.6.5 Using the Static Sample Plate

The static sample plate can be used with whole flat products such as cookies, and spaces the product off the window to prevent contamination. The sample is over the hole in the plate.

The plate is located on the spigots on the top of the unit and should be orientated facing upwards so that the hole for the light beam is central with the window, as shown below.

Figure 4-9 Location and orientation of static sample plate

4.6.6 Using the Reference Standard

1. Locate the reference standard in the accessories case and remove it to use with the InfraLab TL.

Figure 4-10 Reference standard in accessories case

2. Before using the standard, check that the surface of the white tile is undamaged and free of marks/contamination. If damaged, contact Nordson for a replacement, and if marked, clean with a damp clean cloth.

3. Ensure that the sample window is clean and if not, clean with a damp cloth. Ensure that both the sample window and the ARS are dry before continuing.

4. Remove the auto-sampler accessory from the top of the unit and note the lines around the sample window, showing the location that the reference standard is to be placed.

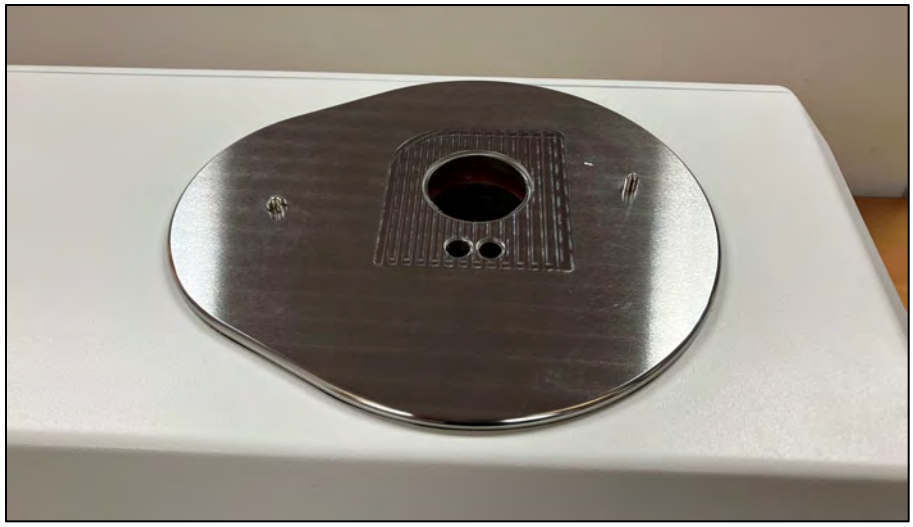

Figure 4-11 Lines around sample window

5. Place the reference standard within the lines as shown, facing downwards, ready for re-referencing or a reference check.

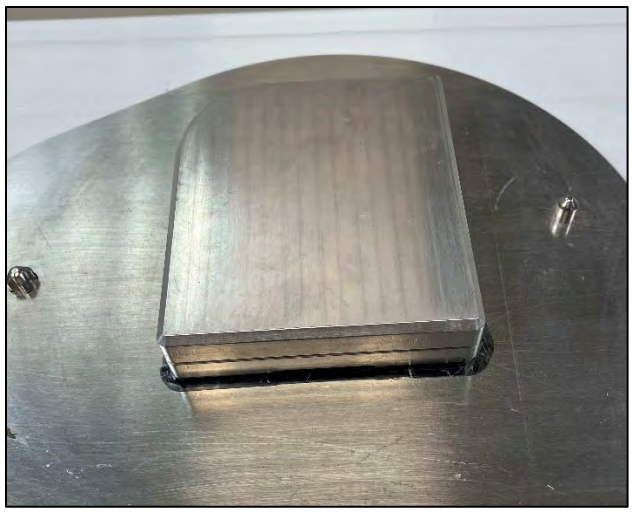

Figure 4-12 Place reference standard within lines

4.7 Installing USB Devices

Connected USB devices will automatically be identified and shown on a diagnostics page. Typically, these may include:

- a storage device (USB flash memory device or external hard disk) for mass storage of sample results.
- barcode readers, which are user-configurable (see Section 6.12.4.1 - Configuring Barcode Readers) for identification of samples, products or users.

Compatible Barcode Readers

The following barcode readers can be used with the InfraLab TL:

- Wasp WCS3900 Handheld Barcode Scanner

- Zebra LS2208 Handheld Barcode Scanner

Contact Nordson for further support.

Flash Memory Drive Specification

Most USB flash memory drives with the following specification are supported.

- Maximum 42 Gb capacity
- FAT 32

BitLocker encrypted USB's are also supported.

Note: A BitLocker encrypted USB takes longer to mount than a standard USB, so it may take several seconds before the USB appears on the Diagnostics page.

See Section 6.12.4.2 - USB Flash Memory Drives. Contact Nordson for further support.

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CHAPTER 5

5 Operation

5.1 Overview

The control panel touch screen provides access to all user-controllable functions, including those used for InfraLab TL configuration and calibration. On startup, the login screen is displayed (Figure 5-1). The login screen varies, depending on the application. Sample login screens are shown in Figure 5-2.

Figure 5-1 Login screen

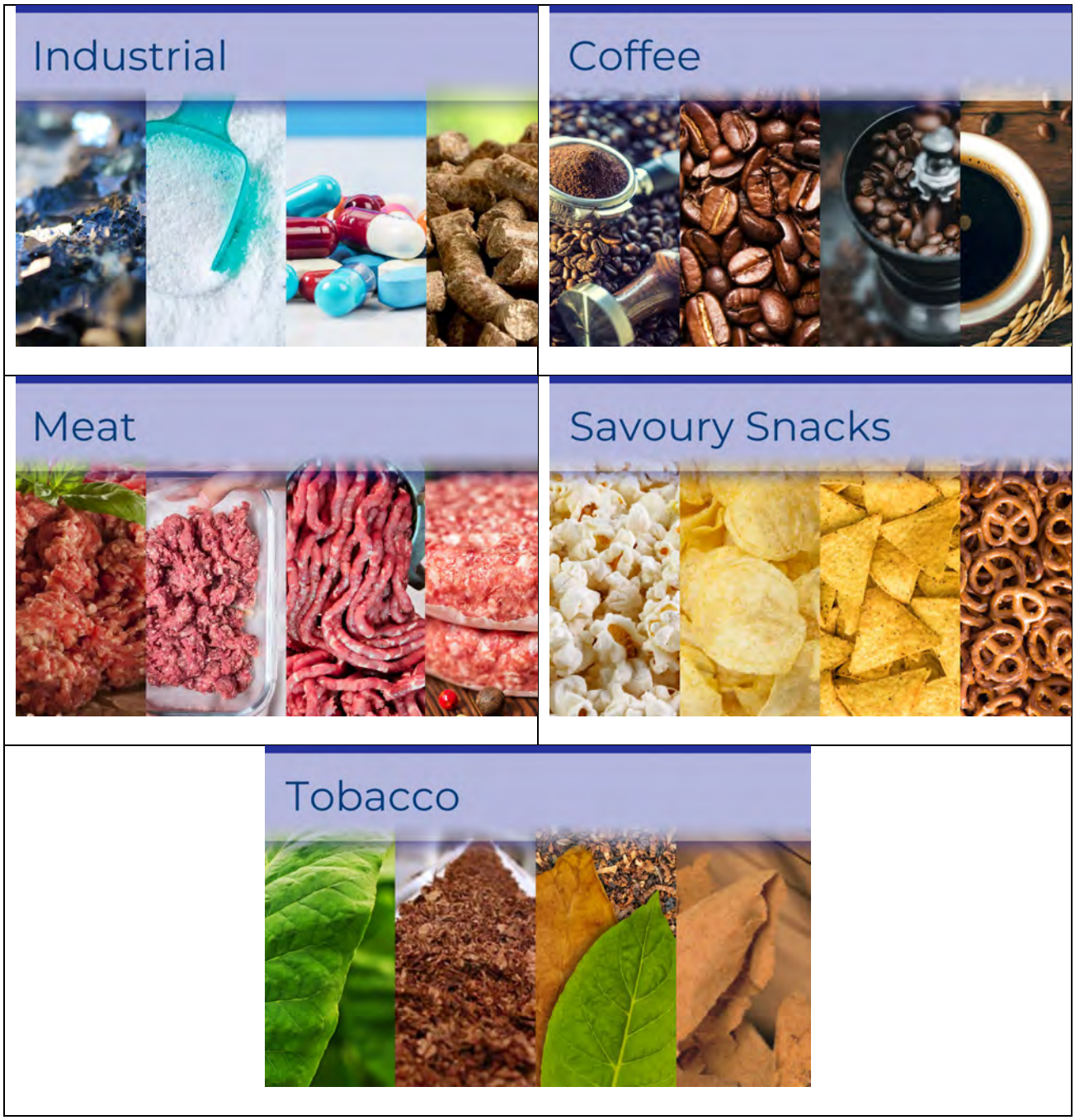


Figure 5-2 Sample Login screens

5.1.1 Logging In and Out

5.1.1.1 User Levels

The InfraLab TL analyser supports three user levels:

- **Operator** – this user has access to basic functions such as product sampling and system diagnostics. An Operator user may be set up with or without a password.
- **Supervisor** – this user requires a password. The default password for Supervisor is “1111”. A user logged on as a Supervisor has access to more functions than the Operator user.
- **Engineer** – this user is primarily for use by engineers. It also requires a password. The default password for Engineer is “2222”. A user logged on as an Engineer has access to more functions than the Supervisor or Operator user. For example, only the Engineer level can access the barcode reader configuration.

5.1.1.2 Logging In

To log in:

1. Tap the Login screen (Figure 5-1, Figure 5-2).
2. The User Login screen will appear (Figure 5-3).

   Select the user and enter the password if prompted.

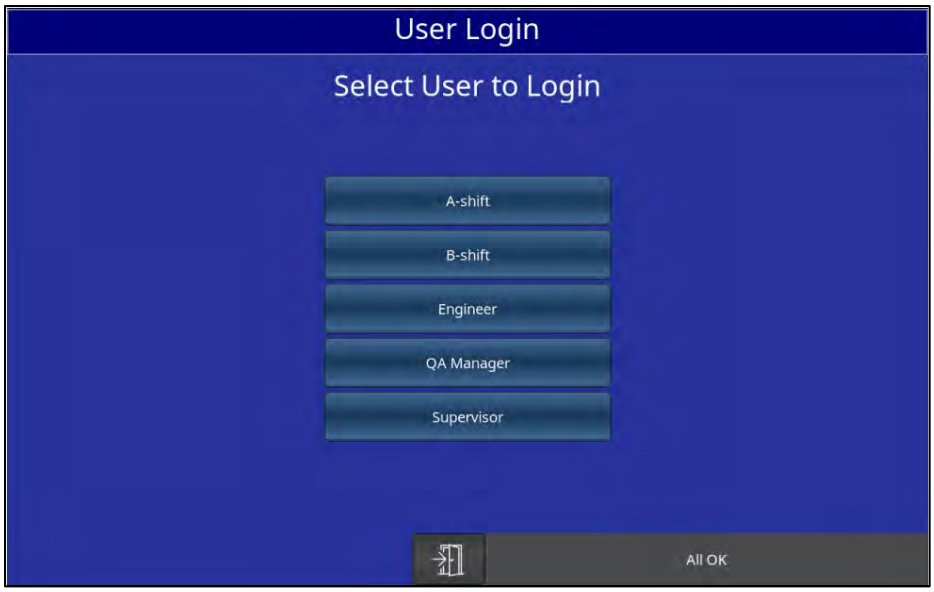


Figure 5-3 User Login screen

5.1.1.3 Logging Out

To log out, touch the  **Log Out** button, then press **Yes** to confirm.

5.1.1.4 Auto Logoff

When setting up a user, a Supervisor or Engineer has the option of entering a Logout period for automatically logging a user out if there is no screen activity within that period. See Section 6.12.1.3 - Adding a User. Note that a Supervisor may edit the Logout period for any user except an Engineer.

5.1.2 Toolbar Buttons

The following toolbar buttons appear at the bottom of the screen. They vary, depending on the current mode and the currently logged in user.

Button	Description
	**Back** – Returns to the previous page.
	**Select Product** – This button brings up the page for selecting a product. After a product is selected, the screen switches to the Sample page for taking a sample. See Section 5.3.2 - Presenting Samples.
	**Sample History** – This button brings up the page for viewing the sample history. See Section 5.4 - Viewing the Sample History.
	**Configuration** – This button is available only to a Supervisor or Engineer. It brings up the Settings page.
	**Gauge/Reference Check** – This button appears on the Gauge Diagnostics page. It brings up the Gauge/Ref. Check page. See Section 7.2.5 - Checking Analyser Stability.
	**Calibrate** – This button is available only to a Supervisor or Engineer. It brings up the Calibration page. See Section 7.2.2.1 - Obtaining Samples and Calibration.

Button	Description
	**Audit Trail** – This button is available only to a Supervisor or Engineer. It brings up the Audit Trail page. See Section 5.6 - Audit Trail.

5.1.3 Responding to Error Messages

The InfraLab TL Analyser Status is shown in the box on the bottom right of every screen (Figure 5-4). If the InfraLab TL analyser is functioning properly, the message “All OK” is displayed.

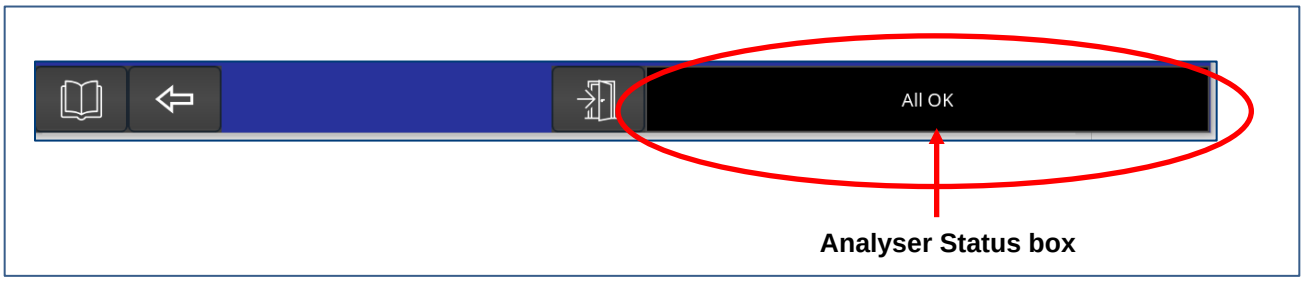


Figure 5-4 Analyser Status box

Touch the Analyser Status box to bring up the Gauge Status page (Figure 5-5). This page shows the Gauge Name, Status, IP Address and uptime duration.

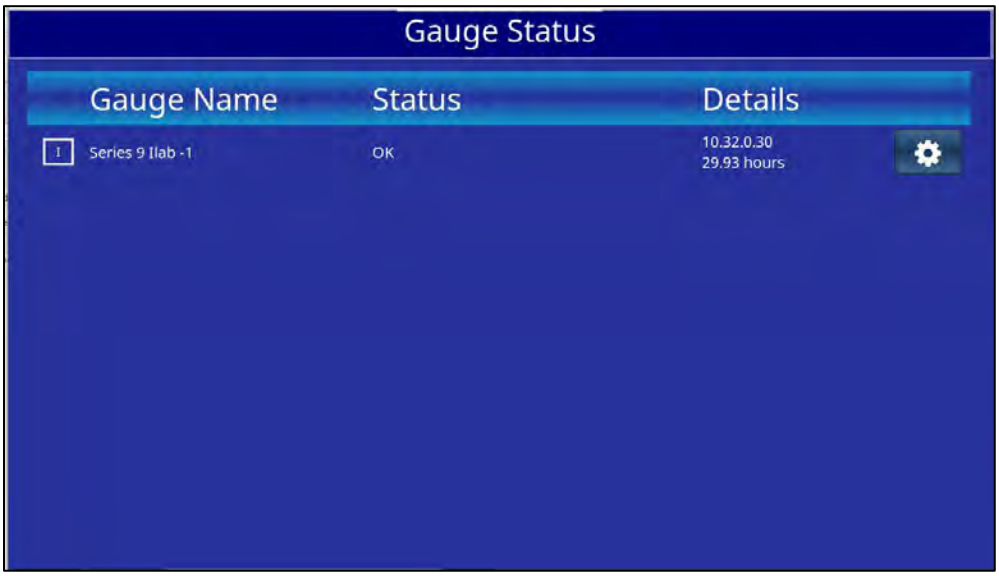


Figure 5-5 Gauge Status page

When a fault occurs on the gauge, it is indicated by a highlighted message in the Analyser Status box, in place of the normal “All OK” message. If there are multiple errors, the one with the highest priority is displayed.

1. Touch the highlighted error message to display the Gauge Status page.

   This lists the gauge with its current status, showing the errors.

2. Refer to the error message descriptions (see Section 9.1 - System Error Messages), and take the relevant actions to clear the error conditions.

3. As each error condition is cleared, the associated error message is automatically removed. On removal of the last error, the message reverts to “All OK”.

5.1.4 Viewing the Software Version

To display the page that shows the software version, slowly tap the Analyser Status box on the bottom right of the screen (Figure 5-4). After seven taps, that page should appear (Figure 5-6). If the page appears briefly, then disappears, continue tapping until it reappears.

The information shown on this page will be helpful if you are contacting Nordson for technical support.

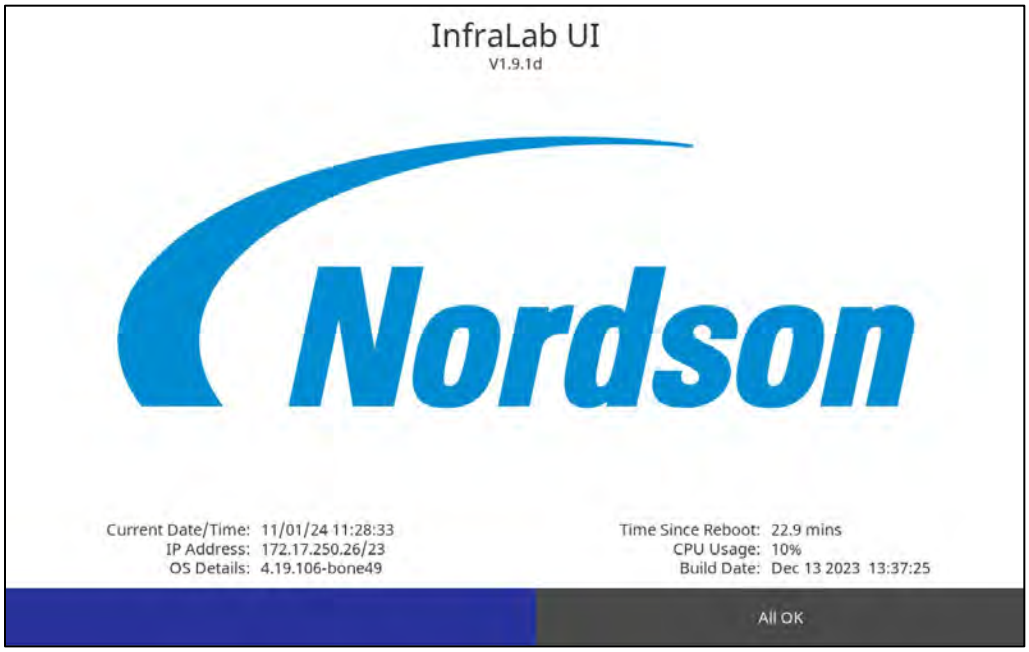


Figure 5-6 Software Version

Note: The information above is also accessible to a Supervisor or Engineer by selecting **Information** on the Local Settings page. See Section 6.7 - Local Settings.

5.2 Data Entry

Pages that allow any sort of data entry, such as a name or numerical value, have touch-sensitive fields which appear as white boxes. For example, Figure 5-7 shows editable boxes on the InfraLab Settings page.

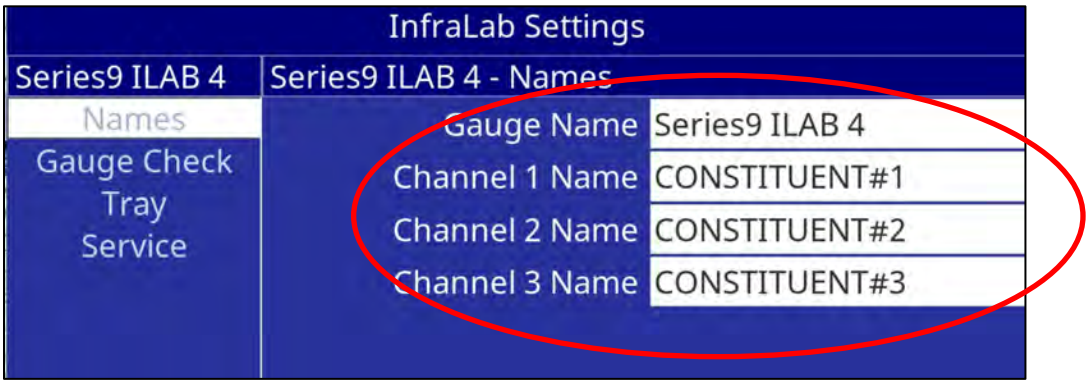


Figure 5-7 Editable boxes on InfraLab Settings page

If a setting is shown in a lightly shaded grey box (such as the ones shown on the Gauge Diagnostics page, Figure 5-8), this indicates that it is read-only.

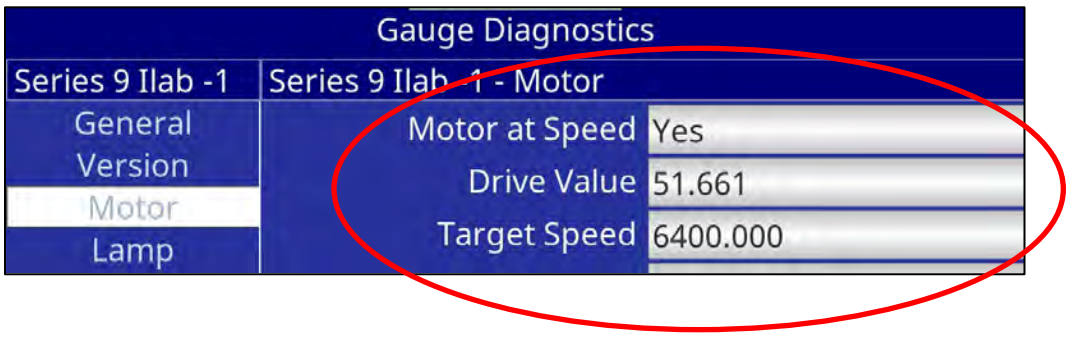


Figure 5-8 Lightly shaded grey boxes on Gauge Diagnostics page

When you touch a data entry field, a full-text keyboard or numerical keypad is displayed, as appropriate for the required entry.

If a new value is entered for a field in a product, that field is shown in a lightly shaded yellow color until the new value is saved or the changes are cancelled (Figure 5-9).

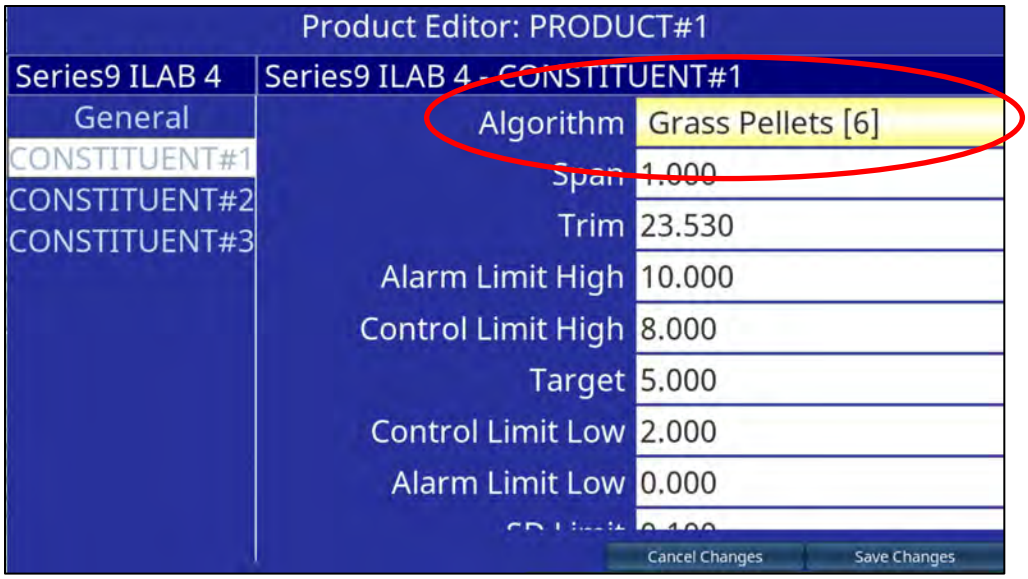


Figure 5-9 Changed value shown in box with light yellow background

There are several different versions of both the full-text keyboard and numerical keypads. The version displayed depends on the current interface language (see Section 6.7 - Local Settings), and on the particular data entry function.

5.2.1 Numerical Keypad

Figure 5-10 shows a sample numerical keypad that is displayed when the **Span** box is touched on the Edit Product page. Note that the position of the cursor is indicated by the flashing vertical line.

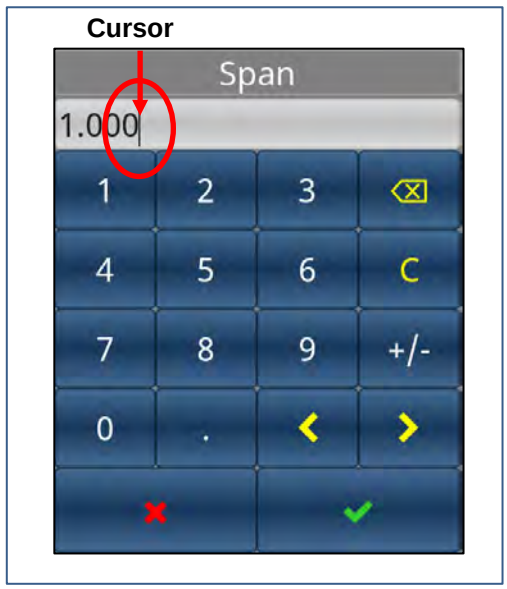


Figure 5-10 Sample numerical keypad

Selected keys appearing on the numerical keypad are described below.

Key	Function
	**Delete** – Deletes the character previous to the cursor
	**Clear** – Clears the current entry
	**+/-** – Changes the sign of the current value (e.g., to enter a minus sign (-) to designate the value as negative)
	**Decimal Point** – Inserts a decimal point
	**Back** – Moves the cursor back by one character
	**Forward** – Moves the cursor forward by one character
	**Cancel** – Cancels the current entry
	**Enter** – Confirms the current entry and closes the keypad

5.2.2 Full-Text Keyboard

Figure 5-11 shows a sample full-text keyboard that is displayed when the **Rename** button is touched on the Configure Products page. Note that the current position of the cursor is denoted by the flashing vertical line.

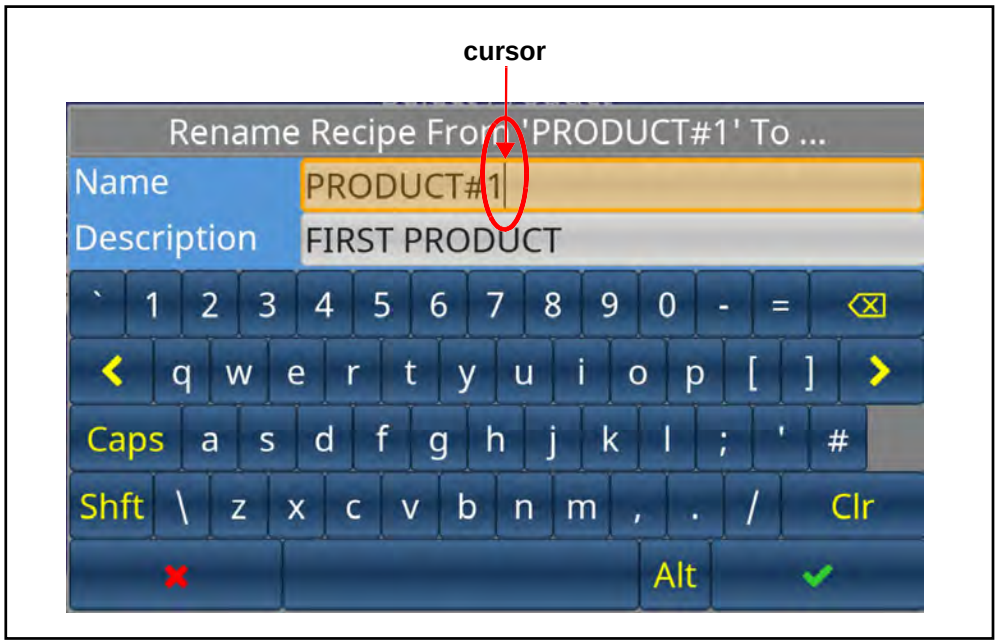


Figure 5-11 Sample full-text keyboard

Some of the keys (e.g., **Enter** and **Cancel**) on the full-text keyboard are identical to those on the numeric keypad. See Section 5.2.1 - Numerical Keypad for a description of those keys. Additional keys are described in the table below.

Key	Function
	**Caps** - Toggles between upper-case and lower-case text entry. The alphabetical keys show the current state. Lower case is the default state.
	**Clear** - Clears the current entry

Key	Function
	**Shift** - Toggles Shift mode on and off. Shift mode is automatically cancelled after a character is entered.
	**Alt** - Toggles full-text keyboards between alternative characters and the standard keypad display.
 , 	**Modified Characters** - Where relevant for the current language, these enable accented and other modified characters to be entered.
	**Pinyin** - Toggles between Pinyin and standard entry modes when the current language is Chinese.
	**Change** - Toggles the full-text keyboards between Hiragana, Katakana and standard entry modes when the current language is Japanese.

The full-text keyboard is included in the following three categories:

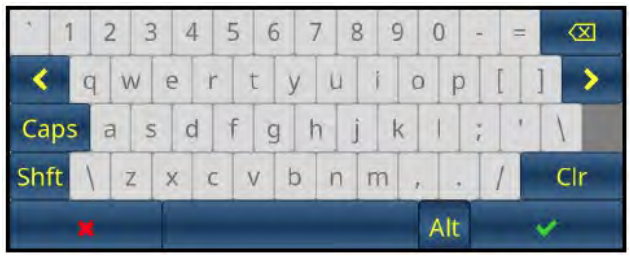
- Standard localised keyboard for languages using Roman and Cyrillic alphabets (see Section 5.2.3 - Standard Localised Keyboard)
- Chinese (see Section 5.2.4 - Chinese Keyboard)
- Japanese (see Section 5.2.5 - Japanese Keyboard)

5.2.3 Standard Localised Keyboard

The standard localised keyboard provides access to the basic Roman and Cyrillic character sets of upper and lower case letters, numbers and punctuation. It also supports language-specific alternative and modified characters.

There are several modes of operation, as shown in the table below.

Lower-case mode (Default) Toggle the **Caps** key to select this mode. This mode provides numbers and lower case letters.	
Caps mode Toggle the **Caps** key to select this mode. This mode provides numbers and upper case letters.	
Shift mode Touch the **Shft** key to select this mode. This mode provides punctuation characters and upper case letters. Shift mode is automatically cancelled after a character is entered.	

Alternative mode Touch the **Alt** button to select this mode. This mode provides alternative characters appropriate to the current language. Alternative mode is automatically cancelled after a character is entered.	
Modified Character mode Provides accented and other modified characters. Modified Character mode is automatically cancelled after a character is entered.	

5.2.3.1 Modified Characters

Where modified characters are available, one or more character modifier keys are added. These keys are displayed in orange, for example:

 or

To enter a modified character:

1. Touch the appropriate character modifier key.

   The modifier is entered in the text box, and keys that have modified alternatives are displayed.

2. If necessary, touch the **Shft** key to access other characters.

3. Do one of the following.

   - Touch the required character key. The character will appear in the text box, and the modified character mode will be cancelled.

   - Touch the **Space** key to exit modified character mode.

5.2.4 Chinese Keyboard

When the selected language (see Section 6.7 - Local Settings) is Chinese, the keyboard has two main operating modes.

Pinyin (default) Pinyin is a system for entering Chinese characters by spelling out their sound using standard Roman characters. Literally translated, Pinyin means 'spell sound' or the 'spelling of the sound'.	
Standard mode The keyboard operates as described for the standard localised keyboards (see Section 5.2.3 - Standard Localised Keyboard).	

The **Pinyin** key toggles between the two modes.

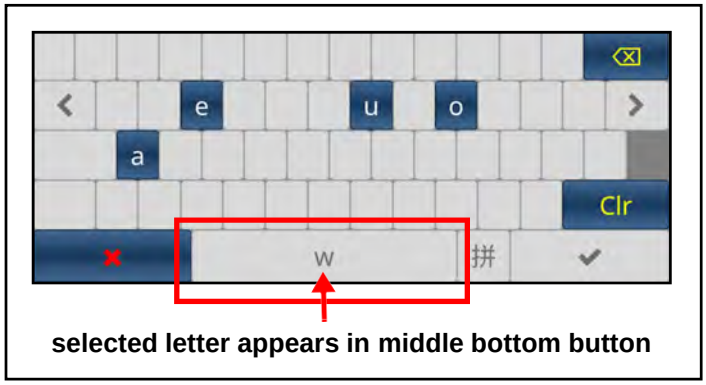
The general procedure for using Pinyin entry is as follows.

1. Select Pinyin mode.

   The keyboard enables only those letters that are valid for starting a character sound.

2. Touch the appropriate letter.

   This appears in the middle bottom button, and the letters that are valid for continuing the sound are enabled on the keyboard.



3. Continue using the letter keys to spell out the required character sound until the number keys are enabled.

   At this point, you can either:

   - continue to select letter keys to define the sound or;
   - select a number key to define the tone of the sound (approximately similar to adding an accent).

     When a number key is selected, the top row of keys changes to display valid Chinese characters for the spelled sound.

4. Touch the required character, which then clears the roman letters and number in the middle bottom button.

5. Repeat this process to add all required characters.

Note: Extensive information on the Pinyin entry system can be found at: http://www.pinyin.info/ and http://en.wikipedia.org/wiki/Pinyin.

5.2.5 Japanese Keyboard

When the selected language (see Section 6.7 - Local Settings) is Japanese, the keyboard provides access to three writing systems, each of which has different operating modes.

Hiragana (default) In Hiragana, you can also access the Kanji entry system.	
Katakana The keyboard provides for direct entry of full- and half-width characters.	 
Standard The keyboard operates as described for the standard localised keyboards (see Section 5.2.3 - Standard Localised Keyboard).	

The **Change** key toggles between the three writing systems.

5.2.5.1 Hiragana

The Hiragana keyboard provides two systems of character entry.

Direct Hiragana mode in which characters selected on the keyboard are added directly to the text box.	
Kanji mode (default) Provides the ability to enter Kanji characters by selecting a sequence of Hiragana characters.	

The **Kanji** key toggles between the two systems.

Using Direct Hiragana Entry

1. Select the **Kanji** key.

2. Enter characters, as required, direct from the keyboard.

3. Use the 

   ,  , or  key as necessary to access shifted characters and voiced modifiers (see Section 5.2.5.3 - Voiced Modifiers).

Using Kanji Entry

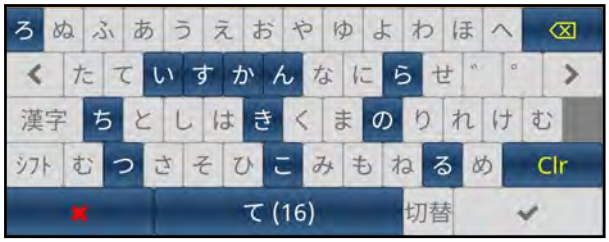
The general procedure for using Kanji entry is as follows.

1. Touch the required character key.

   This will narrow the keypad selection to only those characters that can still complete a Kanji character. The **Space** key shows selected character, with the total number of Kanji characters available for selection in parentheses.

   For example, after touching the 

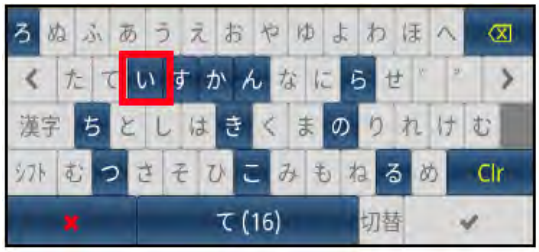
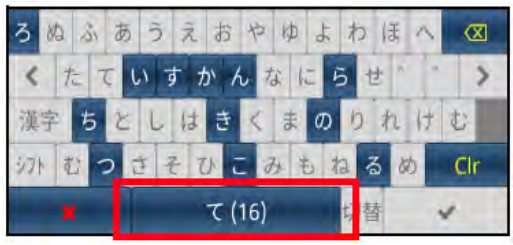
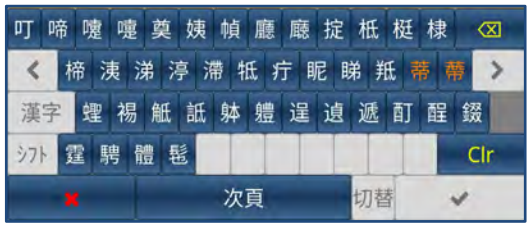
key, the keyboard shows this:

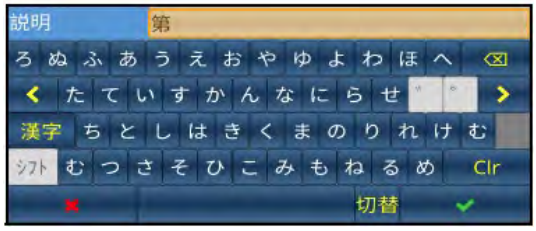


2. At this point, you can do **either** of the following:

   - Narrow the search for Kanji characters by selecting further characters.
   - View currently available Kanji characters.

The procedures are illustrated in the examples below.

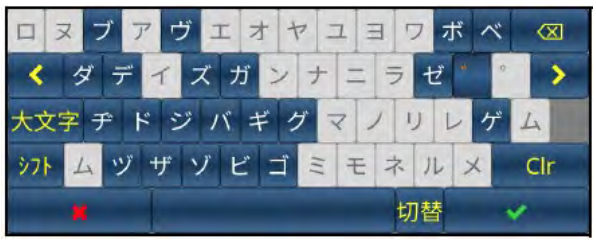
Narrow the search	View Kanji characters
• Select another character. The number of keys available for further selection is reduced. 	• At any point in the process of entering characters, the **Space** key shows the number of available valid Kanji characters. Touch the key to view them. 
• Continue to add keyboard characters. When the search cannot be narrowed any further, the available Kanji characters are displayed. 	• If there are more Kanji characters than it is possible to display, touch the **Space** key to view more. 

Narrow the search	View Kanji characters
• Select the required Kanji character. The selected character will appear in the text box. 	• If the required Kanji character is available, select it to enter it into the text box. • If not, touch the **Delete** key to return to the narrowing process. 
• The keyboard is now ready for entry of the next Kanji character.	
• Repeat this process to add all required Kanji characters.	

Note: Extensive information on the Kanji entry system can be found at: http://en.wikipedia.org/wiki/Kanji

5.2.5.2 Katakana

The Katakana writing system provides several modes of operation:

Caps mode Use the 大文字 key to toggle in and out of Caps mode.	
Shift mode Use the シフト key to toggle in and out of Shift mode. Shift mode is automatically cancelled after a character is entered.	
Half width mode displays a keyboard of half-width characters. Use the **Change** 切替 key to toggle between half width and full width characters.	
Modified Character mode Use the シフト, ゛, or ゜ key as necessary to access shifted characters and voiced modifiers (see Section 5.2.5.3 - Voiced Modifiers). Modified Character mode is automatically cancelled after a character is entered.	

5.2.5.3 Voiced Modifiers

The Hiragana and Katakana full-width modes support character modifiers for voiced and semi-voiced sound marks. The associated keys are displayed in orange.

To enter a modified character:

1. Touch the appropriate character modifier key.

   The keys that have modified alternatives are displayed.

2. If necessary, touch the 

key to access other characters.

3. Do one of the following.

   - Touch the required character key. The character will appear in the text box, and the modified character mode will be cancelled.

   - Touch the **Delete**  key. The modified character mode will be cancelled.

5.3 Taking Samples

Refer to the Best Practice Guide for details.

Taking a sample is the process of allowing the InfraLab TL to measure one or more constituents in a product sample and present the results. The measurements are shown immediately on the touch screen and are also stored in internal memory for analysis at any time. They can be written to an external USB storage device for permanent mass storage or added to a database within a PC running InfraLab Manager software, either directly via Ethernet or manually transferred using a USB storage device.

Taking a sample involves:

1. Preparing the product sample for measurement.
2. Placing the sample in the InfraLab TL.
3. Selecting the InfraLab TL Product (see Section 6.5 - Loading Products) that has been pre-defined for the material being measured.
4. Starting the sample function.

Depending on the configuration of the InfraLab TL:

- The sample function may start automatically when the sample bowl is placed in position, or require a manual start by pressing an on-screen button.
- Each sample may be automatically given a unique ID, or depending on the configuration of the InfraLab TL, the ID can be entered manually or via a barcode reader.

These actions are covered in the Sampling instructions (see Section 5.3.1 - Sampling Settings and Section 5.3.2 - Presenting Samples).

5.3.1 Sampling Settings

There are two groups of settings for configuring the sampling process:

- **Sample settings** - accessible only to a Supervisor or Engineer
- **Tray settings** - accessible only to an Engineer

Sample Settings

1. Touch the  **Configuration** button to bring up the Settings page.
2. Touch the  **Sample Settings** button to bring up the Sample Settings page (Figure 5-12).

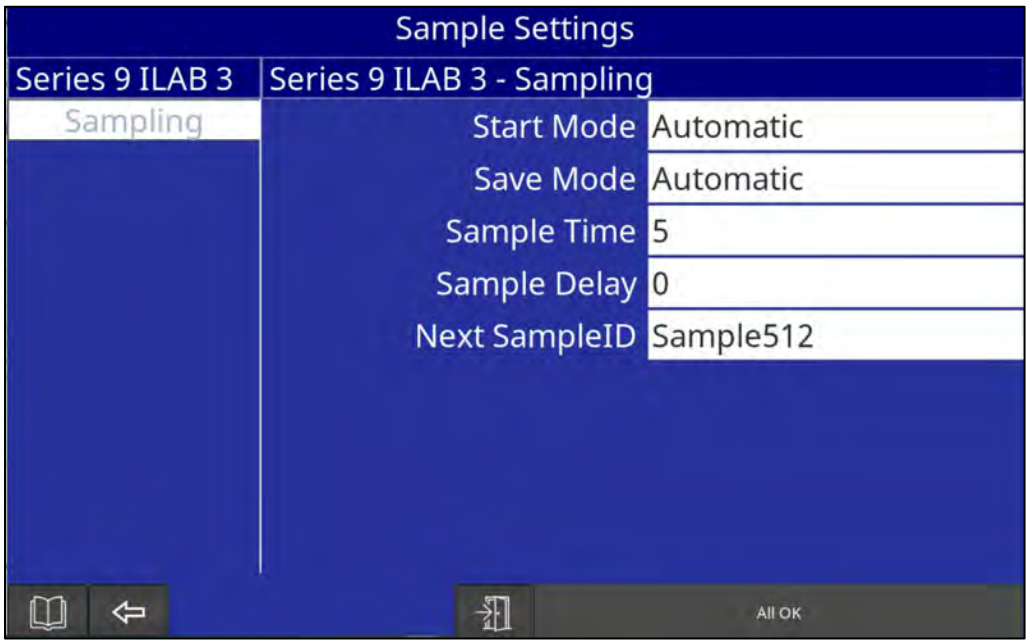


Figure 5-12 Sample Settings page

The sampling settings include:

- **Start Mode**
  Select **Automatic** to start the sample function automatically when the sample bowl is placed in position. Select **Manual** to require a manual start (using the touch screen) for sampling.

- **Save Mode**
  Sets whether the sample data is saved automatically, requires a manual save, requires a manual save with an option to discard the sample, or is user selectable.

If **User Selectable** is selected for the **Save Mode**, there will be a list box on the top left of the Sample page for selecting whether the sample data is saved automatically or requires a manual save (Figure 5-13).

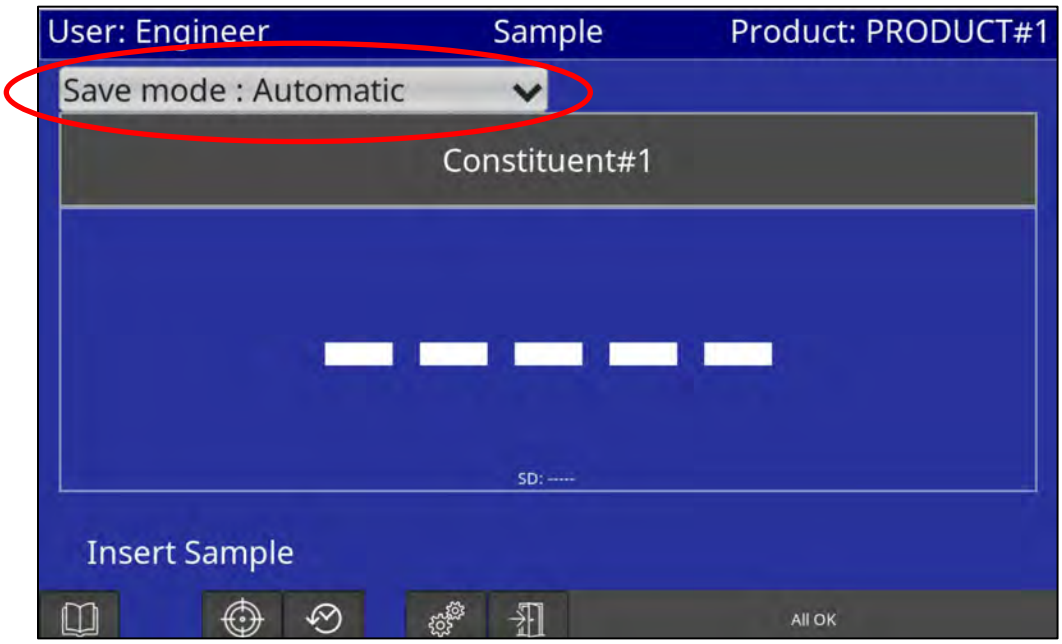


Figure 5-13 User-selectable Save mode on Sample page

- **Sample Time**
  The period over which measurements will be taken, in seconds. This should be chosen according to the product to provide a representative sample. Refer to the Best Practice Guide for recommendations.

- **Sample Delay**
  The delay between sampling being started and the process beginning, in seconds.

- **Next SampleID**
  The Sample ID that will be allocated to the next sample in sequence. The number in the Sample ID will be automatically incremented as each sample is taken.

Tray Settings

1. Touch the  **Configuration** button to bring up the Settings page.
2. Touch the  **Hardware Settings** button, then touch the  **InfraLab Settings** button.
3. Select **Tray** in the left pane (Figure 5-14).

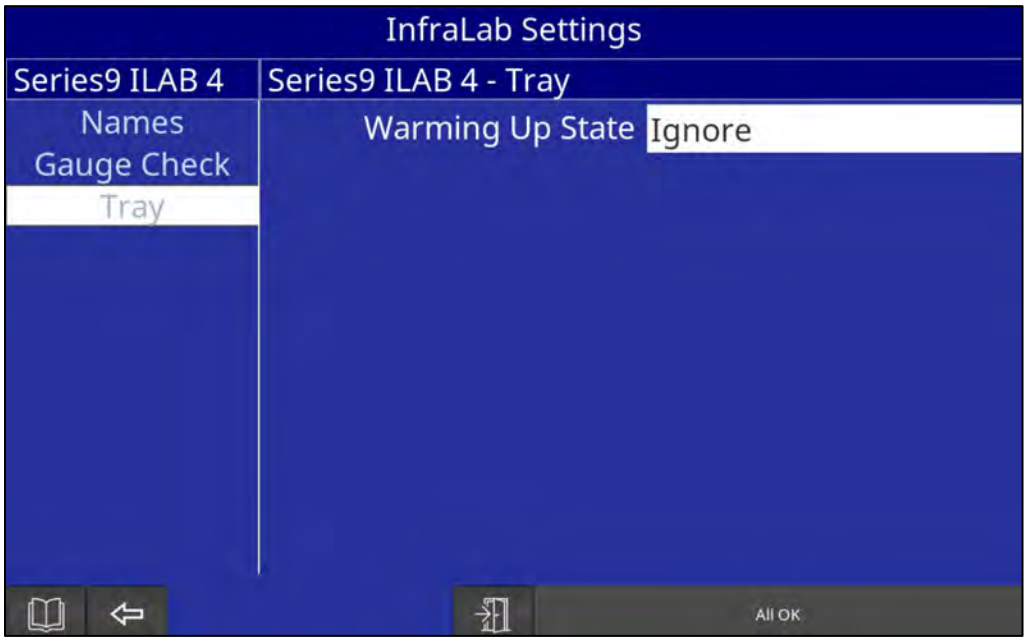


Figure 5-14 InfraLab Settings page - Tray group

The tray setting includes:

- **Warming Up State**
  Selects the InfraLab TL response if a sample is attempted before the internal temperature has stabilised:

  Ignore - Sampling is allowed without a warning

  Show warning - Temperature warning displayed, but sampling is allowed

  Prevent sampling - Sampling is inhibited

5.3.2 Presenting Samples

Refer to Section 4.6.3 - Using the Sample Cell and Section 4.6.4 - Using the Static Sample Plate.

Refer to the Best Practice Guide (supplied separately) for the intended product application for sample preparation information.

Sampling

For correct measurement performance, samples should be taken only when the InfraLab TL has reached a stable temperature. Normally this takes about 2 hours from switch-on. Depending on the configuration, if a sample is attempted before the temperature is stable, the InfraLab TL will respond according to one of three rules:

- **Prevent sampling** - Sampling will be inhibited until the correct temperature is reached
- **Show warning** - A warning will be displayed, but sampling is allowed
- **Ignore** - Sampling will proceed without warning

To measure a sample:

1. Place the prepared sample in the bowl. Ideally the sample should:
    - fill the bowl
    - be evenly spread in the bowl
    - completely cover the base of the bowl
2. Put the bowl onto the InfraLab TL sample turntable.
3. Select the product. Either:
    - Scan a Product ID barcode using the barcode reader

    OR

    - Open the Products page (Figure 5-15).
        1. Touch the  **Product Selection** button.
        2. Select the appropriate product from the list. An example product list is shown in Figure 5-15.

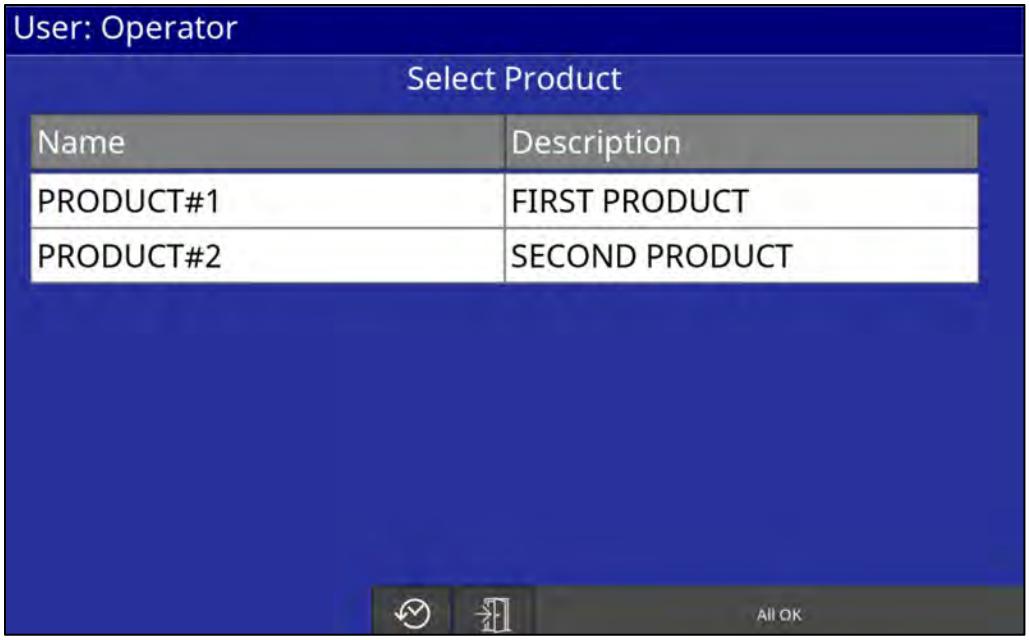


Figure 5-15 Products page

4. The Sample page will be displayed (Figure 5-16).

   If the sample does not start automatically within 5 seconds, touch the **Start Sample** button.

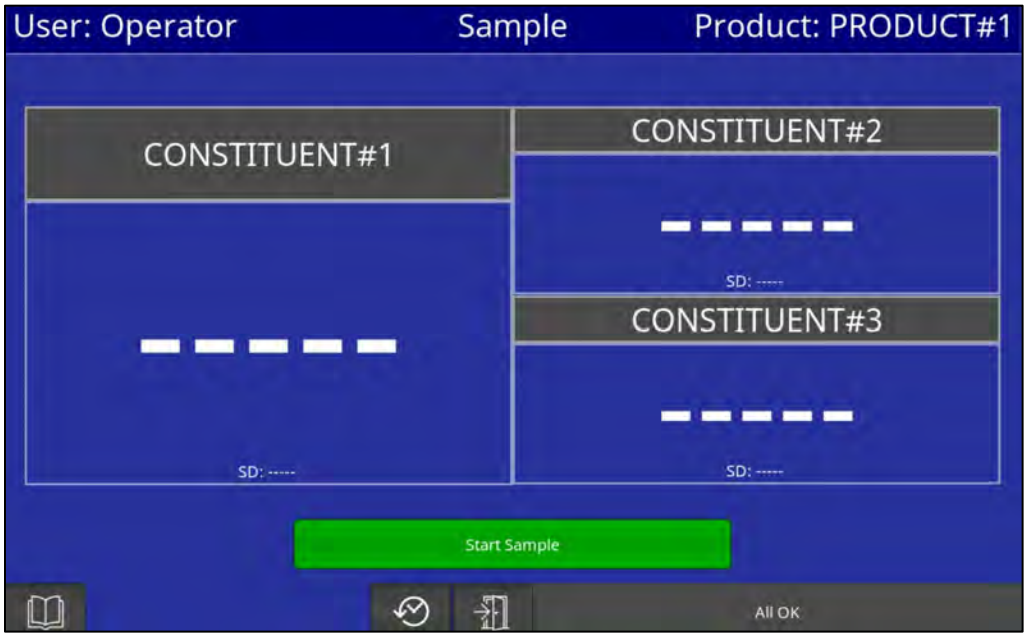


Figure 5-16 Sample page

5. The screen will display a wait message, followed by a countdown. While the countdown is visible, sample collection may be aborted by touching the **Cancel Sample** button. When the countdown is completed, the sample results will be displayed (Figure 5-17). For each constituent, the measured constituent value is shown with the SD (standard deviation) value below it.

Figure 5-17 Sample results

6. The **Sample ID** field shows the default Sample ID that will be assigned to the sample. This ID can be changed either by scanning a Sample ID barcode, or by touching the **Sample ID** field and entering the new ID using the keyboard.

7. If the **Save Mode** has been set to an option other than Automatic (on the Sample Settings page, Figure 5-12 or the Sample page, Figure 5-13), there will be a **Save Sample** button. Touch that button to save the sample. Additionally, if the **Save Mode** has been set to Manual With Discard, there will be a **Discard Sample** button for deleting the results of the last sample. The sample results will then be cleared, and for a three component measurement, the screen will revert to the example shown in Figure 5-16.

8. To re-sample the same product, repeat this procedure starting from step **4**.

9. To sample a different product, repeat this procedure starting from step **3**.

Sample Measurement Alarm

If a measured constituent is outside the normal range set for the product, the constituent value:

- Will be displayed in red if outside the alarm limits set for it.
- Will be displayed in yellow if outside the control limits.

The alarm colour is not displayed during sampling, only once sampling has completed.

Sample Deviation Alarm

If a constituent measurement varies by more than the standard deviation limits set for the product, the S.D. value is displayed in red, but not during sampling, only once sampling has finished.

A standard deviation alarm usually indicates that either:

- The sample is not evenly distributed in the bowl, or;
- The sample is not properly homogenised.

To view the Sample history, see Section 5.4 - Viewing the Sample History.

Sample results can also be exported (see Section 5.5 - Exporting Samples to a USB Mass Storage Device) for analysis with InfraLab Manager software (see Section 3.4 - InfraLab Manager Overview) or other analysis software.

5.4 Viewing the Sample History

The Sample History function can be used to view historical sample data.

1. Touch the  **Sample History** button to bring up the Sample History page (Figure 5-18). A table will display the number of records for each Product.

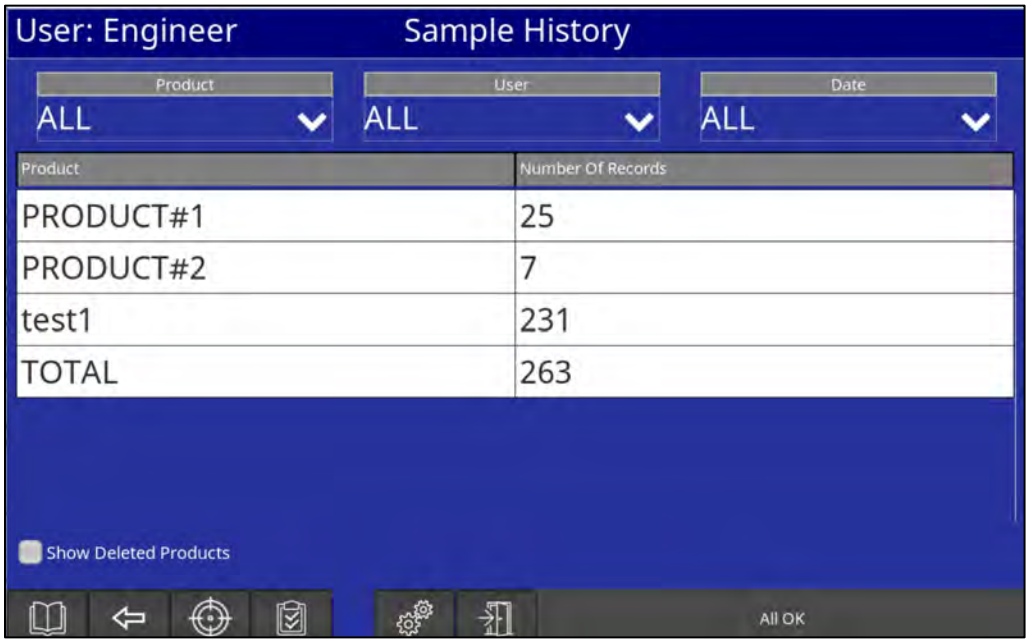


Figure 5-18 Sample History page

2. The records can be filtered by selecting any combination of Product, User name and Date range from the drop-down lists at the top of the page.

3. To view the samples for a particular Product record, the table of sample results can be seen by touching on the Product name.

4. Either the newest or oldest samples are listed first, depending on whether the **Newest First** or **Oldest First** box is checked at the bottom of the page. Figure 5-19 shows the sample records for the example Product “Product #1”. The table of results may be scrolled through by touch-swiping up or down the screen. Further filtering of the data may be achieved by User or Date Range.

   The SD and measurement values are highlighted in red/yellow if they are outside the alarm/control limits, the same as the Sample page.

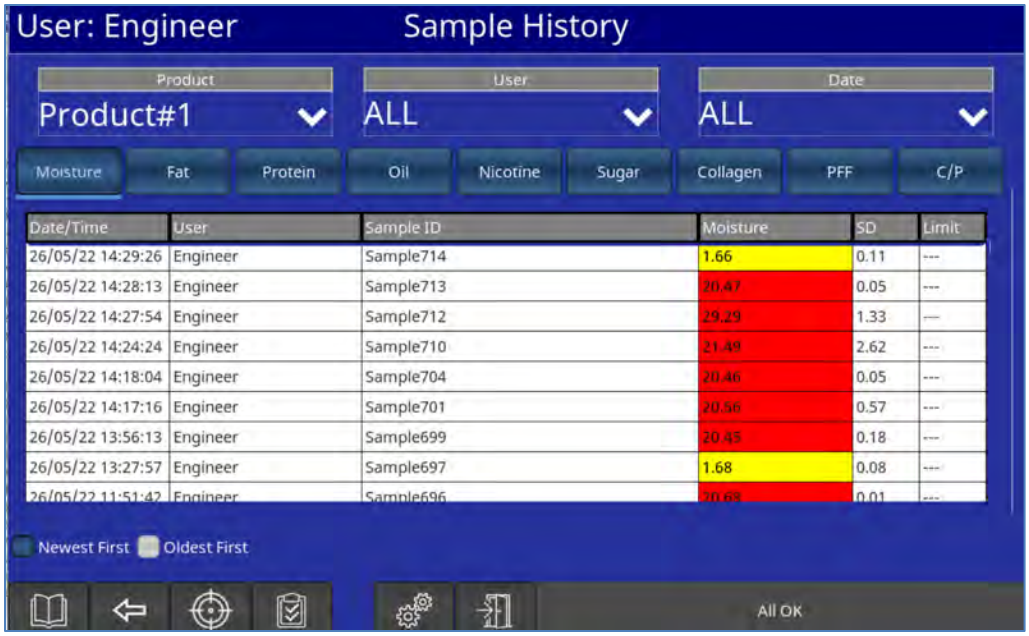


Figure 5-19 Sample records for a selected Product

5.4.1 Viewing Deleted Products

By default, the Sample History page does not show deleted products. There is a **Show Deleted Products** checkbox on the bottom left of the page that enables the inclusion of deleted products in the Sample History summary.

For example, in the following screenshot (Figure 5-20), the deleted product “Oreos” is not shown when the Sample History is first opened.

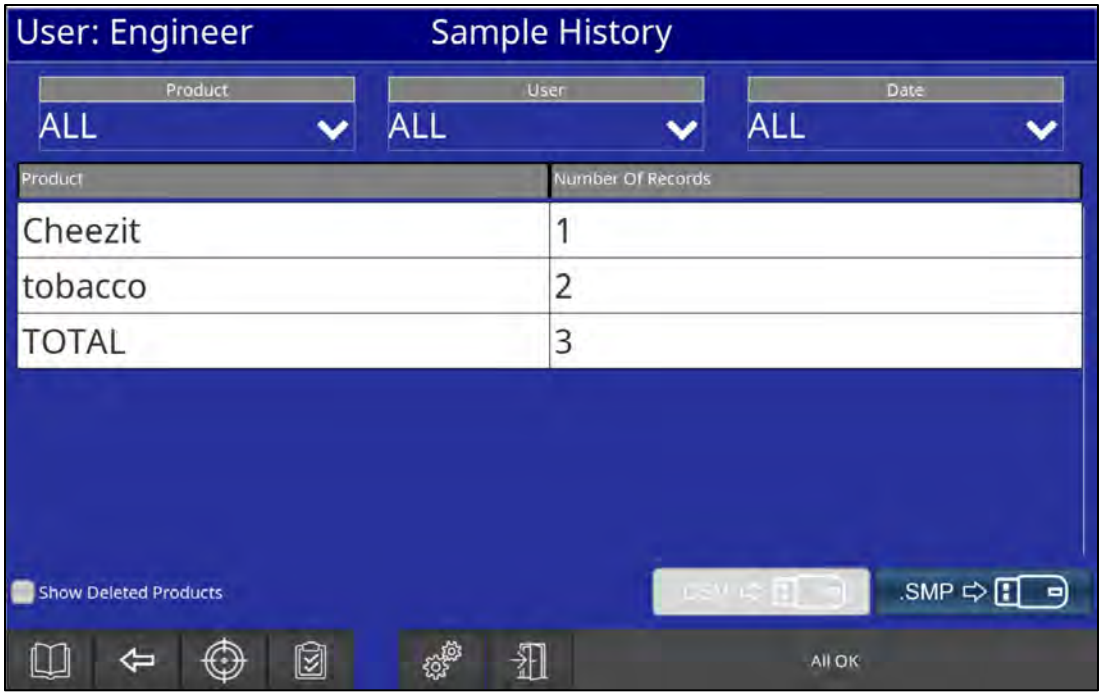


Figure 5-20 Initial Sample History page

After touching the **Show Deleted Products** box, “Oreos” is included in the Sample History (Figure 5-21).

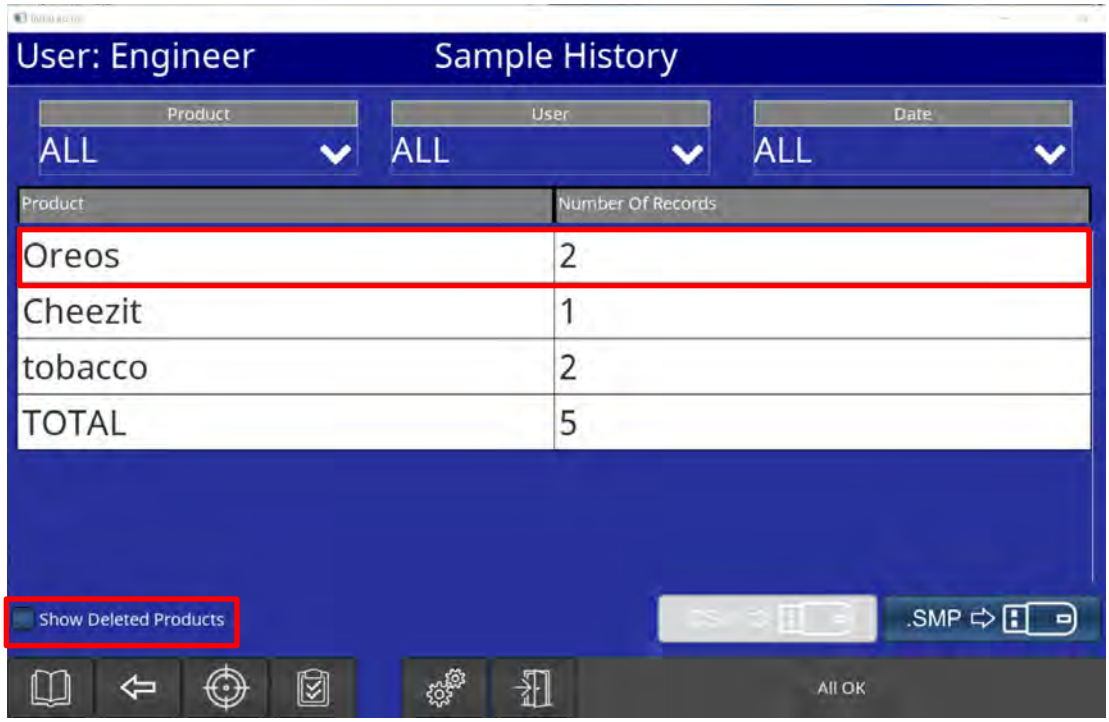


Figure 5-21 Sample History shows deleted product

Note: A deleted product is undeleted by creating a new product with the same name.

5.5 Exporting Samples to a USB Mass Storage Device

When logged in as either Supervisor or Engineer, and a suitable USB mass storage device or 'Memory Stick' is connected to one of the InfraLab TL USB ports, the option to save the sample results to the USB storage device becomes active, and two additional buttons appear on the screen. These buttons are highlighted by the red box in Figure 5-22 below.

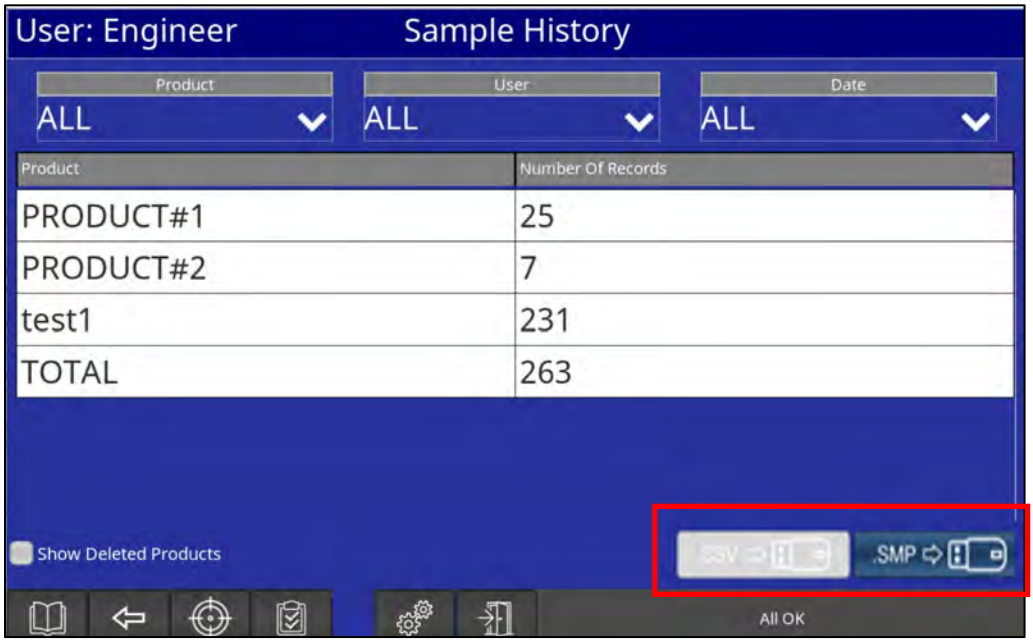


Figure 5-22 Saving multiple product sample records to a USB memory device

To save the sample sets from multiple Products simultaneously to the USB memory, only the **.SMP** file format is available (**CSV** option is greyed out, as in Figure 5-22).

When filters are applied to view the sample history for just a single product, the samples may be saved in single table **CSV** format or **SMP** format, as required (Figure 5-23). The **SMP** format allows the use of a USB mass storage device to manually transfer sample sets from an InfraLab TL to a computer running InfraLab Manager software.

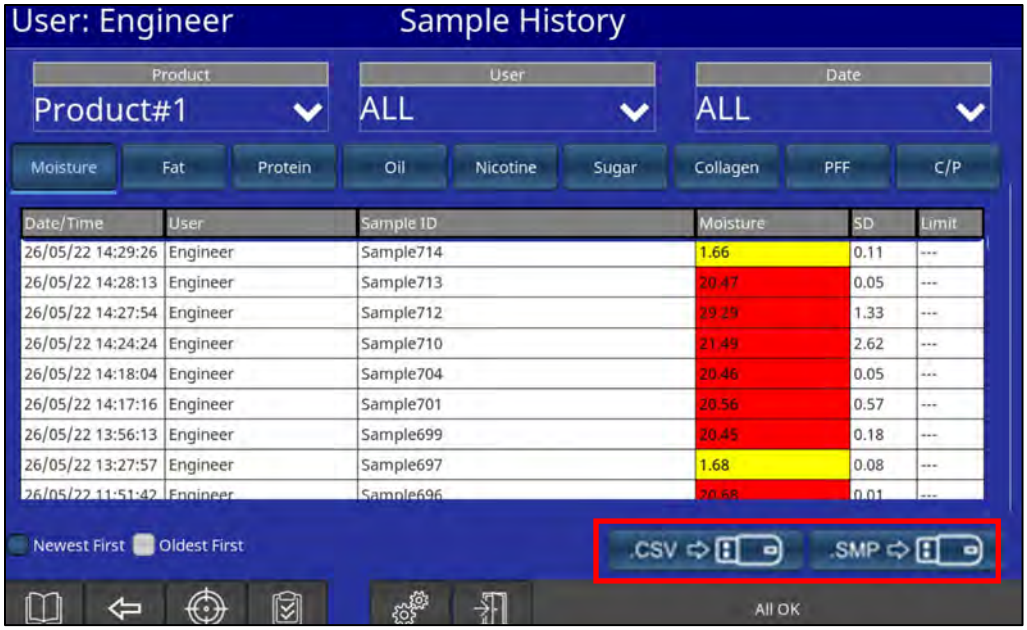


Figure 5-23 Saving a single product sample records to a USB mass storage device

When transferred, the files stored on the USB mass storage device are given the following naming format:

> **ILAB_YEAR_MONTH_DAY_HH_MM_SS** and then the file extension **.CSV** or **.SMP**, depending on which button was pressed to save the file. The time in hours, minutes and seconds is taken from the InfraLab TL on-board clock.

For example: **ILAB_2022_Feb_24_17_10_16.CSV** would be the file name automatically given to a CSV file saved on 24th February 2022 at 17:10:16.

Figure 5-24 shows the button that is visible if the user has not entered the password for a BitLocker encrypted USB drive, or that USB is mounting. This button is also present for a standard USB drive while it is mounting. Touching this button will bring up the USB Settings page (Figure 6-34). Once the USB drive is mounted, BitLocker or standard, the button will disappear.

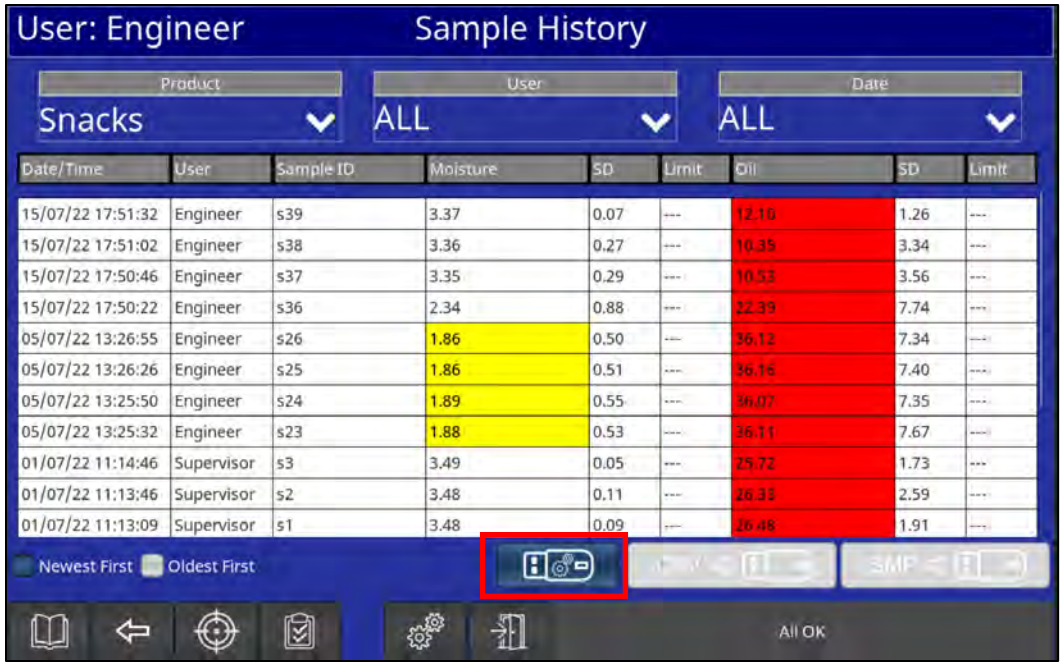


Figure 5-24 Button that is visible while USB drive is mounting

5.6 Audit Trail

Note: The Audit Trail is only available at Supervisor and Engineer level.

To view an Audit Trail of events that have occurred:

1. Touch the  **Sample History** button, then touch the  **Audit** button to bring up the Audit Trail page (Figure 5-25).

   A table will display a list of events by date/time, and if applicable, the user name.

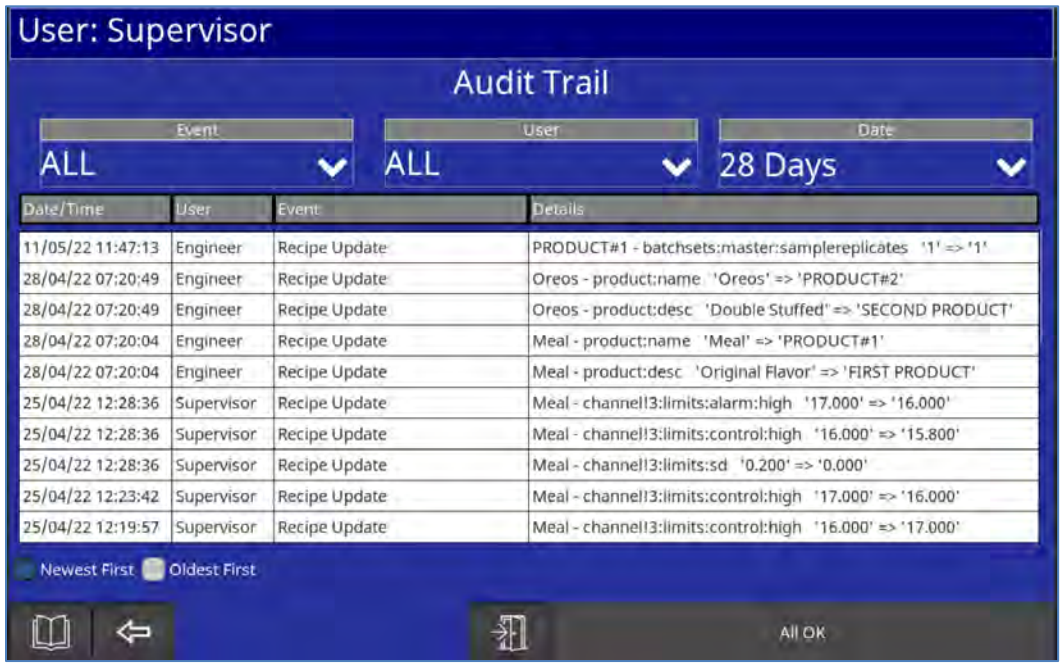


Figure 5-25 Audit Trail page

2. The events can be filtered by selecting any combination of Event, User name and Date range from the drop-down lists at the top of the screen.

3. There are 2 types of events: User and Recipe.

   Events such as a fault condition are not user-dependent, and therefore, do not have a User associated with them.

4. Either the newest or oldest events are listed first, depending on whether the **Newest First** or **Oldest First** box is selected at the bottom of the page.

5. If a suitable USB mass storage device is connected to one of the InfraLab TL USB ports, the audit trail may be exported in either of two available file formats, **CSV** or **TXT**. Figure 5-26 shows the two additional on-screen buttons that are available when a USB mass storage device is connected.

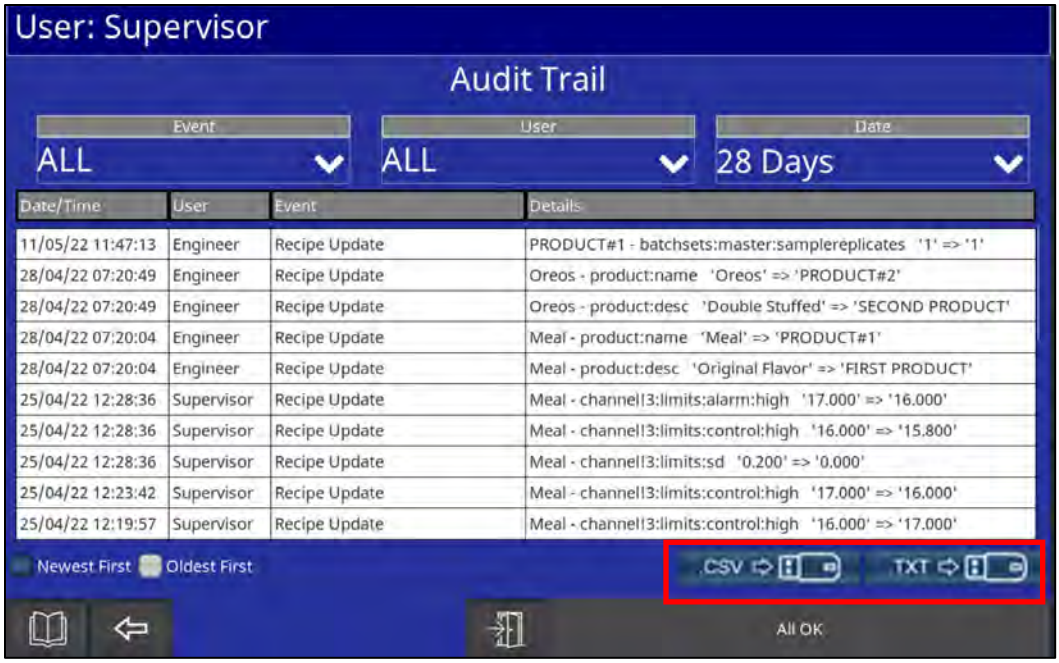


Figure 5-26 Saving the Audit Trail to a USB mass storage device

6. When saved to the USB mass storage device, the Audit Trail file is automatically named using the same file naming format as described in Section 5.5 - Exporting Samples to a USB Mass Storage Device.

Similar to the Sample History page (Figure 5-24), a button is visible on the Audit Trail page, that when touched, brings up the USB Settings page (Figure 6-34), if the user has not entered the password for a BitLocker encrypted USB drive, or that USB is mounting. This button is also present for a standard USB drive while it is mounting. Once the USB drive is mounted, BitLocker or standard, the button will disappear.

CHAPTER
6

6 Supervisor and Engineer Functions

This chapter discusses functions that can only be performed by users with security levels **Supervisor** and **Engineer**.

6.1 Settings Page

Users logged on as a Supervisor or Engineer can access the Settings page (Figure 6-1) by touching the

 **Configuration** toolbar button.

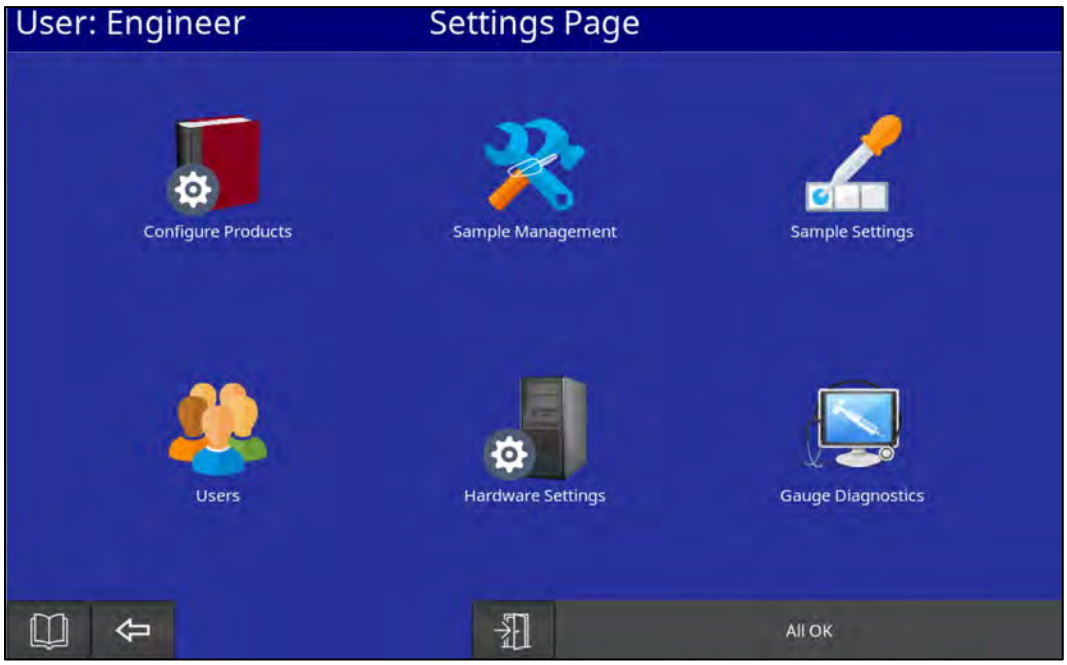


Figure 6-1 Settings page for a Supervisor and Engineer

6.2 Deleting/Restoring Samples

To delete samples:

1. Touch the  **Configuration** button, then touch 

Configure Products.

2. Select the required product, then press **Calibrate** (Figure 7-6) to bring up the Calibration page.

3. Touch the sample name to select one or more samples.
When one or more samples have been selected, the **Delete** button appears (Figure 6-2).

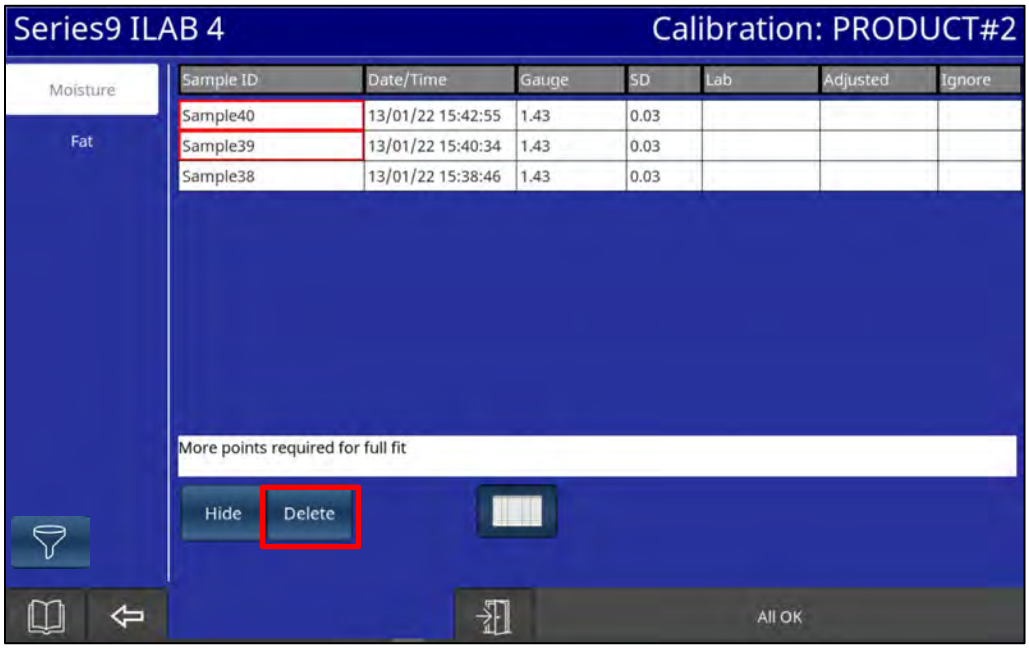


Figure 6-2 Delete button on Calibration page

4. After touching **Delete** and **Ok** to confirm, the selected samples are deleted (Figure 6-3).

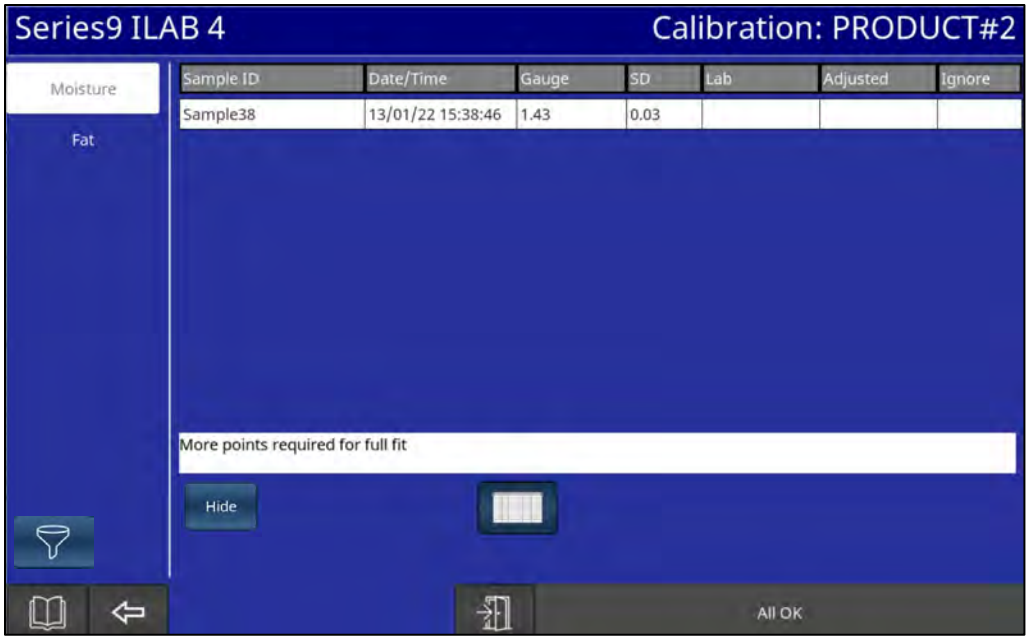


Figure 6-3 Selected samples have been deleted

The deleted samples have not been completely deleted; they are still present in the database, so can be restored by following the procedure below.

6.2.1 Sample Management Page

To display the Sample Management page, touch the  **Configuration** button, then touch

 **Sample Management**.

6.2.1.1 Deleting Samples

When first opened, the Sample Management page is in Delete Samples mode, and the **Delete Samples** checkbox is selected (Figure 6-4). This page shows a list of products. As with the Sample History page, there is a **Show Deleted Products** checkbox to include deleted products.

Note: When a product is deleted, the samples associated with it are not – they can be deleted or restored independently from the product definition.

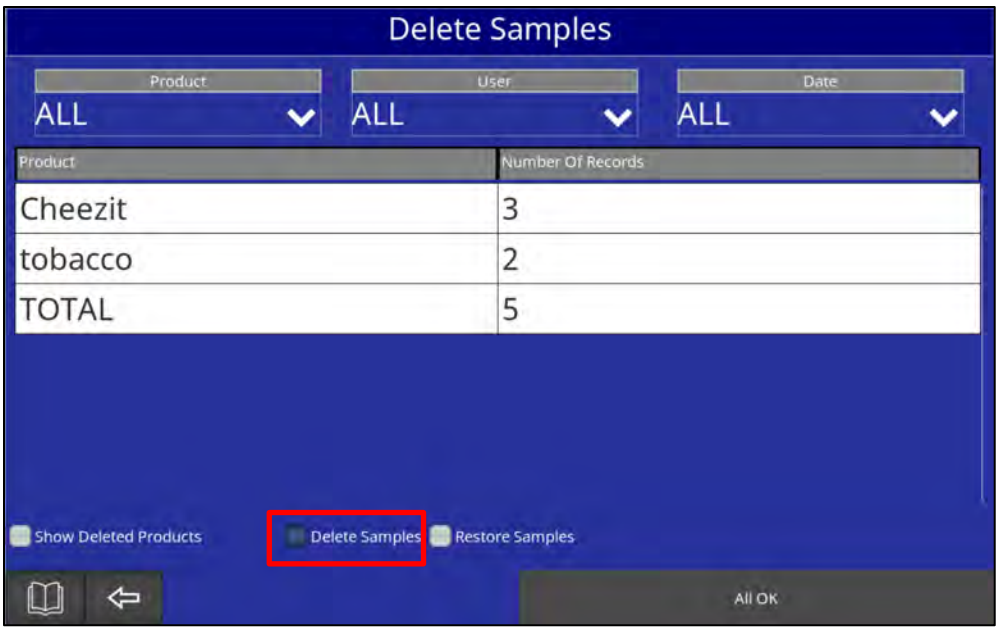


Figure 6-4 Sample Management page – Delete Samples mode

If a product is selected from the list, a summary of existing samples for that product will be displayed – these are samples that can be deleted (Figure 6-5). Either the oldest or newest samples are listed first, depending on whether the **Oldest First** or **Newest First** box is checked at the bottom of the page.

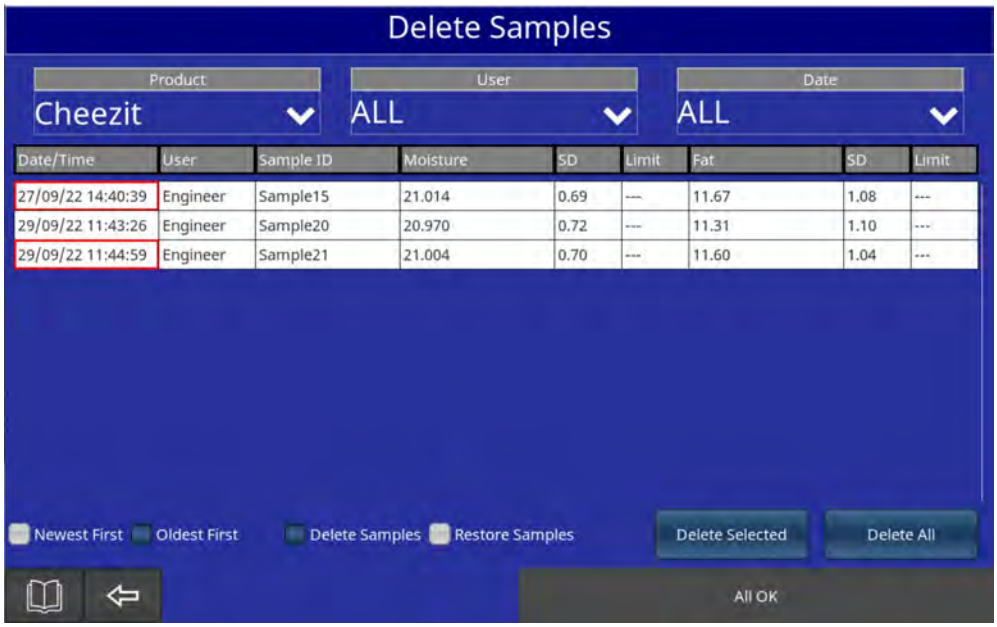


Figure 6-5 Samples that can be deleted

The user can delete selected samples, or delete all the listed samples:

- To delete individual samples, select one or more samples by touching the sample Date/Time, then touch the **Delete Selected** button.
- To delete all samples shown, touch the **Delete All** button.

Further filtering of the samples shown may be achieved by selecting from the **User** and **Date** drop-down lists at the top of the page. Note that the **Date** filter selects the oldest samples, unlike the Sample History page where the filter selects the newest. For example, with the above samples listed for Cheezit (Figure 6-5), selecting the 24 Hours filter displays samples within 24 hours of the oldest sample (Figure 6-6).

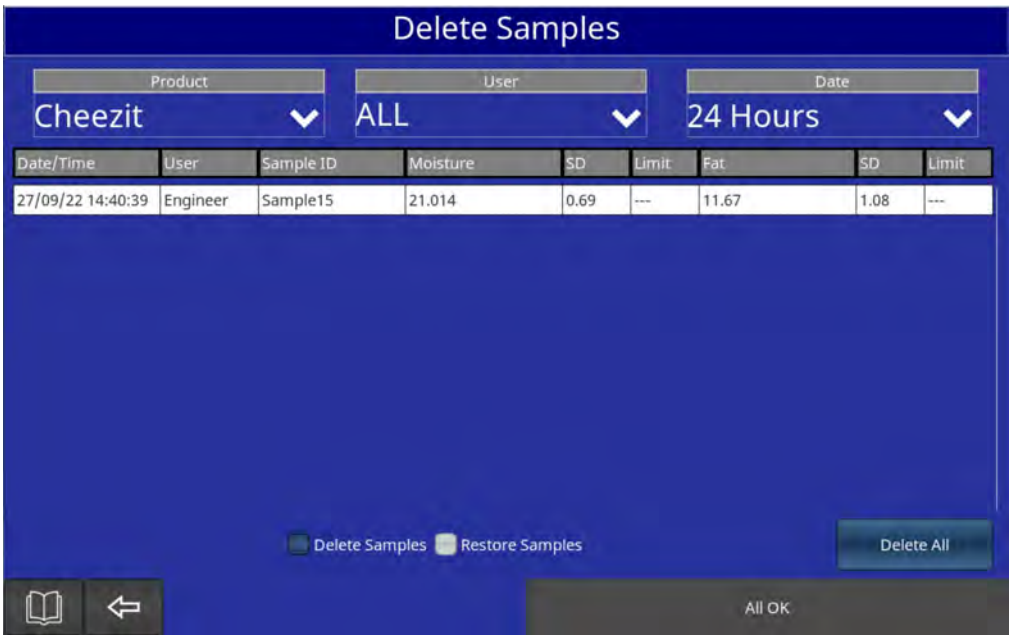


Figure 6-6 24 Hours Date filter for Cheezit

If the **Delete All** button is selected now, only Sample15 will be deleted.

6.2.1.2 Restoring Samples

Touching the **Restore Samples** box on the Sample Management page (Figure 6-4) switches to Restore Samples mode. The summary page then shows previously deleted samples by product. These are samples that can be restored. Figure 6-7 below shows that there are 2 deleted tobacco samples that can be restored.

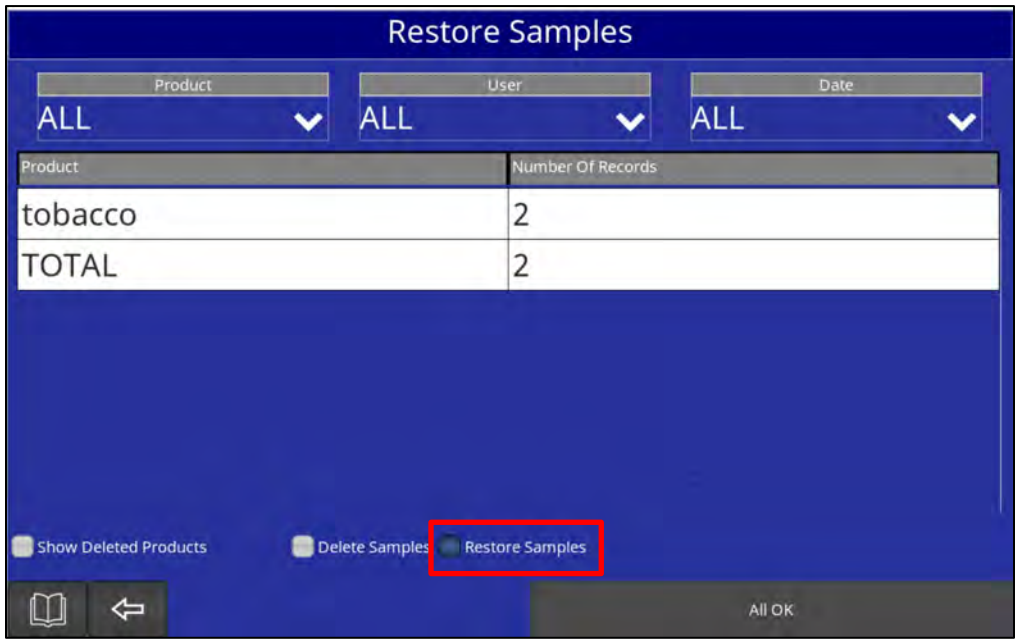


Figure 6-7 Sample Management Page – Restore Samples mode

If a product is selected from the list, a summary of deleted samples for that product will be displayed – these are samples that can be restored (Figure 6-8). Either the oldest or newest samples are listed first, depending on whether the **Oldest First** or **Newest First** box is checked at the bottom of the page.

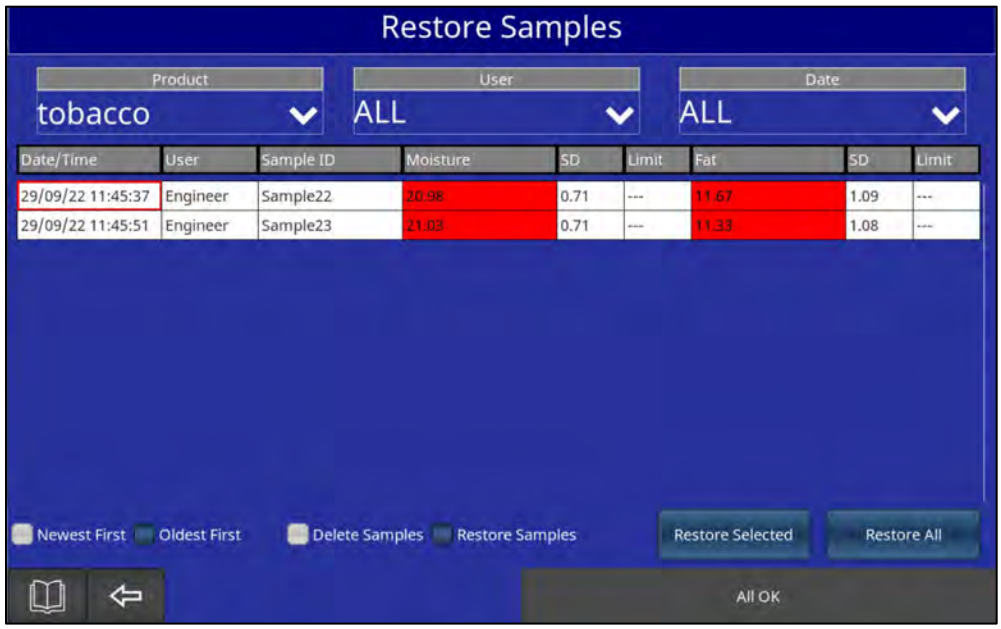


Figure 6-8 Deleted samples that can be restored

The user can restore selected samples, or restore all the listed samples:

- To restore individual samples, select one or more samples by touching the sample Date/Time, then touch the **Restore Selected** button.
- To restore all samples shown, touch the **Restore All** button.

Further filtering of the samples shown may be achieved by selecting from the **User** and **Date** drop-down lists at the top of the page.

6.3 Gauge Diagnostics

The Gauge Diagnostics function provides facilities for:

- Viewing a range of diagnostic data from the gauge
- Re-referencing the gauge
- Conducting a reference check

6.3.1 Viewing Diagnostic Information

The Gauge Diagnostics page displays various diagnostic information about the gauge.

To view the Gauge Diagnostics, Supervisors and Engineers can touch the  **Configuration** button and then touch the 

Gauge Diagnostics button.

There are 4 groups of information that can be viewed on the Gauge Diagnostics page, selectable by touching **General**, **Version**, **Motor** or **Lamp** from the left pane of the screen.

The **General** group (Figure 6-9) displays information such as the internal temperature of the InfraLab TL and the window contamination level.

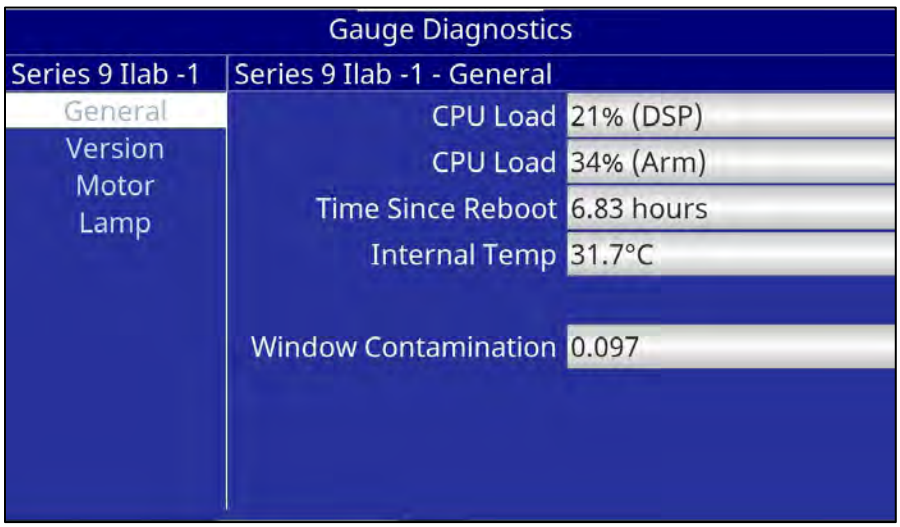


Figure 6-9 Gauge Diagnostics page – General group

The **Version** group (Figure 6-10) displays information about the version of the software and application in the gauge.

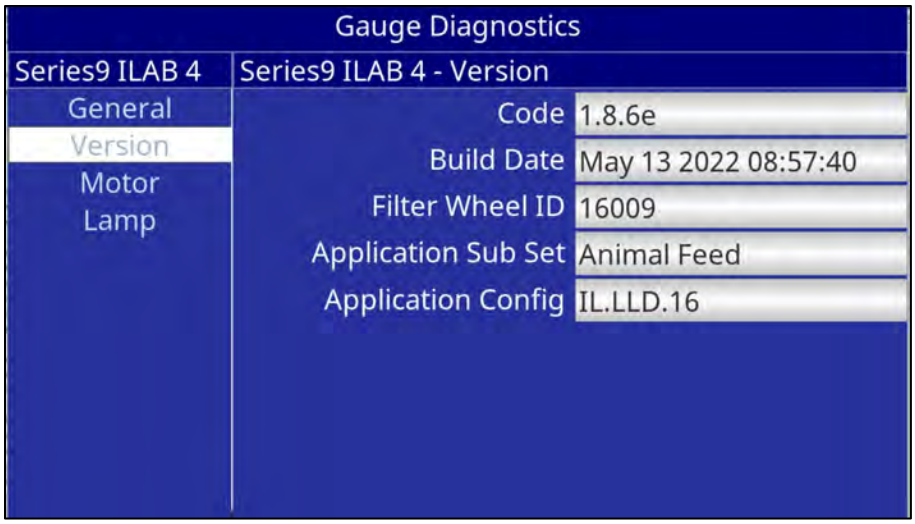


Figure 6-10 Gauge Diagnostics page – Version group

The **Motor** group (Figure 6-11) displays information about the filter wheel motor, such as the target and current speeds.

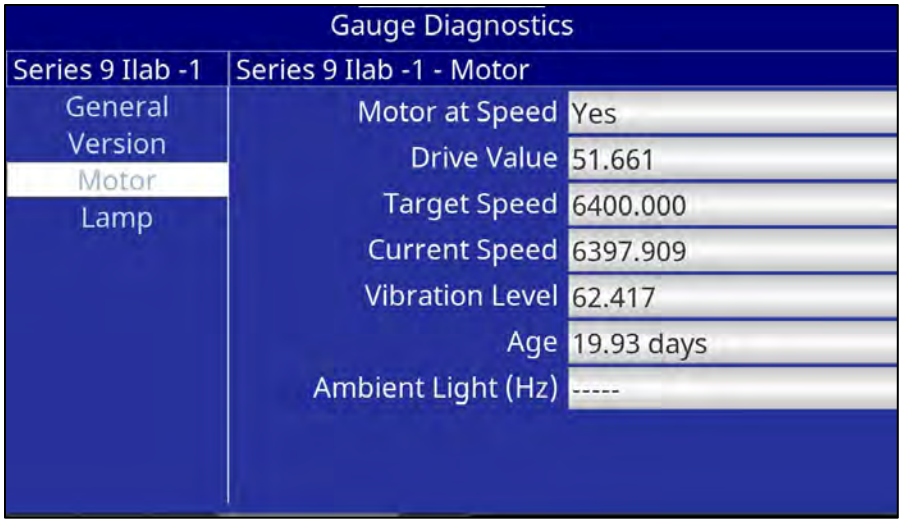


Figure 6-11 Gauge Diagnostics page – Motor group

The **Lamp** group (Figure 6-12) displays information about the lamp, such as the current and voltage.

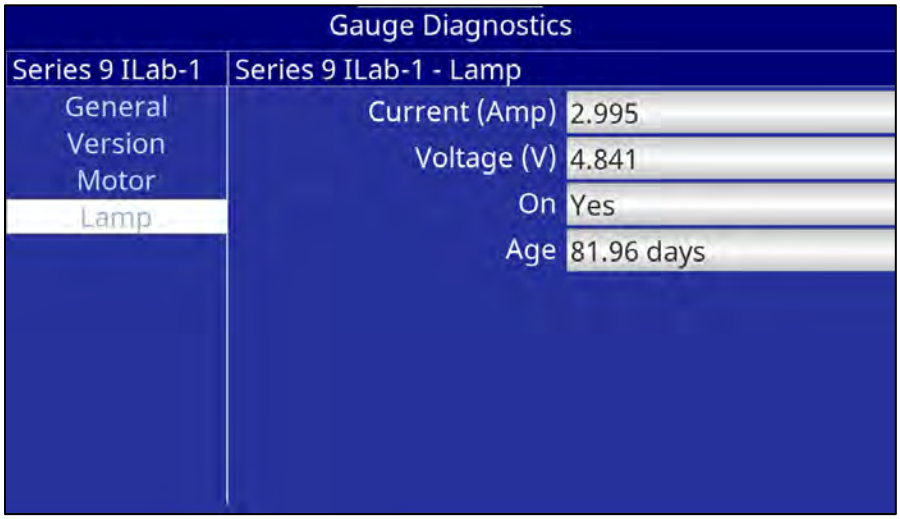


Figure 6-12 Gauge Diagnostics page – Lamp group

Section 9.1 - System Error Messages describes which parameters on the Gauge Diagnostics page to monitor when error messages are shown.

6.3.2 Performing an Internal Reference

This is described in the Calibration section (see Section 7.2.3 - Internal Referencing the Analyser).

6.3.3 Performing a Gauge Check

This is described in the Calibration section (see Section 7.2.5 - Checking Analyser Stability).

6.4 About Products

The InfraLab TL has a small number of user-configurable settings that govern the way it measures. Products are named collections of these settings, stored in the InfraLab TL for recall as required. Their function is to enable the InfraLab TL to be adjusted quickly and accurately whenever the process product is changed.

Normally, InfraLab TLs are supplied with the required products pre-installed as part of the factory configuration. These products may be modified, and new ones created, using the procedures described in this section.

Note: To avoid confusion in these instructions between the products stored in the analyser and the products from which the analyser is taking measurements, where necessary we have used the terms “analyser product” and “process product” respectively.

6.5 Loading Products

This function can be used to recall a selected product in the analyser. When this is done, the values stored in the product become the current analyser values for making measurements. There are 2 ways to load a product:

1. Via the **Product Selection** button (accessible to all users).

2. Via the **Load** button on the Configure Products page (accessible only to a Supervisor or Engineer).

6.5.1 Loading Via the Product Selection button

To load a Product:

1. Touch the  **Product Selection** button to bring up the Products page.

2. Select a product from the list.

   The screen will switch to the Sample page (Figure 5-16).

6.5.2 Loading via the Load button with Configure Products (Supervisor & Engineer Only)

To load a Product:

1. Touch the  **Configuration** button, then touch 

Configure Products to bring up the Configure Products page (Figure 6-13).

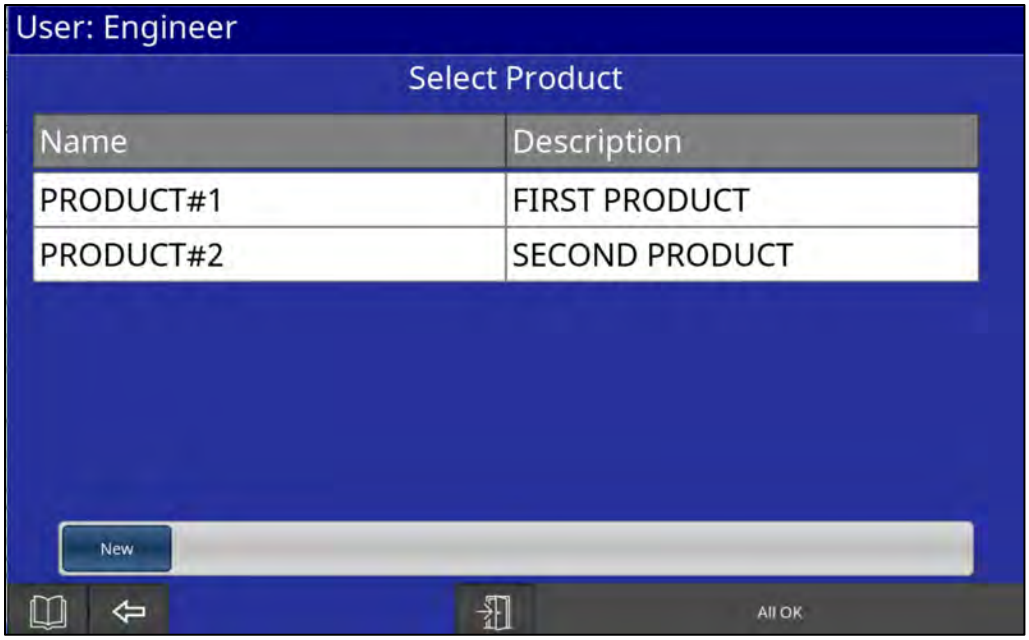


Figure 6-13 Configure Products page

2. Select a product from the list.
   A number of buttons will appear below (Figure 6-14).

Figure 6-14 Configure Products page after selecting a Product

3. Touch the **Load** button.

The screen will switch to the Sample page (Figure 5-16).

6.6 Managing Products

To bring up the Configure Products page, touch the  **Configuration** button, then touch 

Configure Products. Select a product from the list shown, and a number of buttons will appear (Figure 6-14). These buttons are described below.

6.6.1 Creating a New Product

The following procedure has the effect of creating and storing a new product in the InfraLab TL. The settings for the new product can then be changed by editing the product.

1. Open the Configure Products page (Figure 6-13):

    **Configuration >** 

   Configure Products

2. Touch the **New** button.

3. Enter a **Name** for the product using the keyboard provided.

4. Touch the **Description** box and enter a description of the product using the keyboard.

5. Touch the  **Enter** button to save the entry.

6. Follow the procedure below (Section 6.6.2 - Editing an Existing Product) to edit the settings in the product.

6.6.2 Editing an Existing Product

The Edit Product function allows the settings in the product to be adjusted according to requirements. Initially, the screen shows settings for the **General** group (Figure 6-15). These settings include the **Barcode** of the product and the **Replicate Count**.

The **Barcode** linked to the product, if required, is the barcode number that is entered via an on-screen keypad.

The **Replicate Count** is the number of individual samples to be averaged together for the on-screen and recorded sample measurement. When the Replicate Count is set to 1, the measurement result is displayed at the end of every sampling process. If, for example, the Replicate Count is set to 2, at the end of measuring the first sample, the InfraLab TL will show the average result for the first sample and then wait for a second sample to be introduced for measuring. When two samples have been measured, the average of the two samples will be displayed, and this result will be appended to the table of stored sample results.

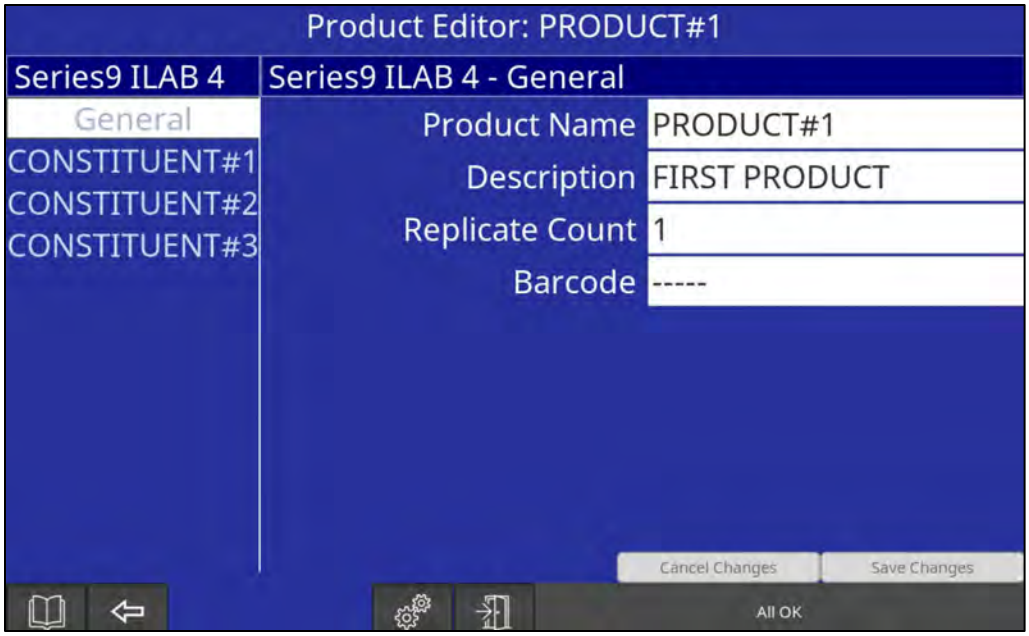


Figure 6-15 Edit Product page − General group

When a measurement channel is selected from the left pane (Figure 6-16), some of the settings shown are described below.

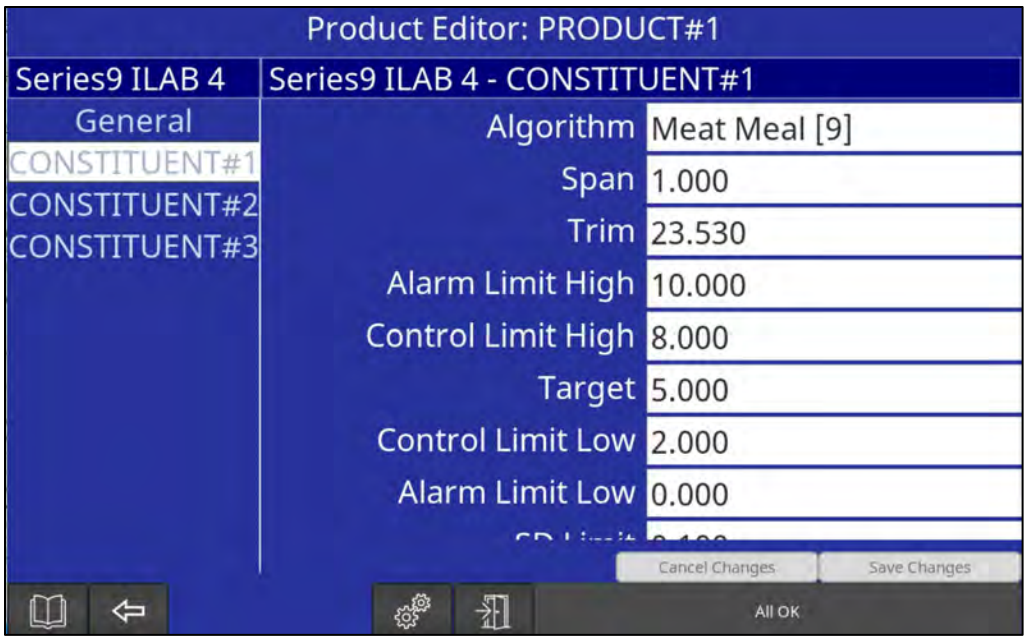


Figure 6-16 Edit Product page − Measurement Channel group

• **Algorithm**	The measurement algorithm supplied with the analyser is optimised for the intended analyser application. The algorithm should not be changed unless the analyser is to be used for a different application from the one for which it was supplied. In this case, contact Nordson (see Section 1.4 - Contact Information) for advice on selecting an appropriate algorithm.
• **Span**	Refer to Calibration overview (see Section 7.1 - Calibration Overview).
• **Trim**	Refer to Calibration overview (see Section 7.1 - Calibration Overview).
• **Decimal Places**	The number of decimal places to display the measurement to.

To edit product settings:

1. Open the Configure Products page (Figure 6-13):

    **Configuration** >  **Configure Products**

2. Select the product you wish to edit from the list.

3. Touch the **Edit** button, and the Edit Product page will appear.

4. Set the values as needed.

5. Touch the **Save Changes** button. (This button and the **Cancel Changes** button are disabled until one or more changes have been made to the settings. If the **Cancel Changes** button is touched, the changes will be erased, and the settings will revert to their original values.)

6.6.3 Copying a Product

This procedure creates a new product, with all settings copied from an existing one.

1. Open the Configure Products page (Figure 6-13):

    **Configuration** >  **Configure Products**

2. Select the product you wish to copy from the list.
3. Touch the **Duplicate** button.
4. Enter a **Name** for the product using the keyboard provided.
5. Touch the **Description** box and enter a description of the product using the keyboard.
6. Touch the  **Enter** button to save the entry.

   The new product will be added to the list.
7. Edit the settings of the new product as required (see Section 6.6.2 - Editing an Existing Product).

6.6.4 Renaming a Product

To rename a product:

1. Open the Configure Products page (Figure 6-13):

    **Configuration** >  **Configure Products**
2. Select the product you wish to rename from the list.
3. Touch the **Rename** button.
4. Edit the **Name** entry for the product using the keyboard provided.
5. (Optional) Touch the **Description** box and edit the description of the product using the keyboard.
6. Touch the  **Enter** button to save the entry.

   The updated product name and description will appear in the list of products.

6.6.5 Deleting a Product

When a product is no longer needed, it can be removed permanently.

1. Open the Configure Products page (Figure 6-13):

    **Configuration** >  **Configure Products**
2. Select the product you wish to delete in the list.

3. Touch the **Delete** button.
4. Touch **OK** to confirm the deletion.

   The product will be removed from the list of products.

6.6.6 Calibrate

This is described in the Calibration section (see Section 7.2.2.1 - Obtaining Samples and Calibration).

6.6.7 Auto Trim

This is described in the Calibration section (see Section 7.2.1 - Using Auto-Trim).

6.7 Local Settings

1. Touch the  **Configuration** button to bring up the Settings page.

2. Open the Local Settings page (Figure 6-17) by touching the buttons shown below.

   Hardware Settings > 

   Local Settings

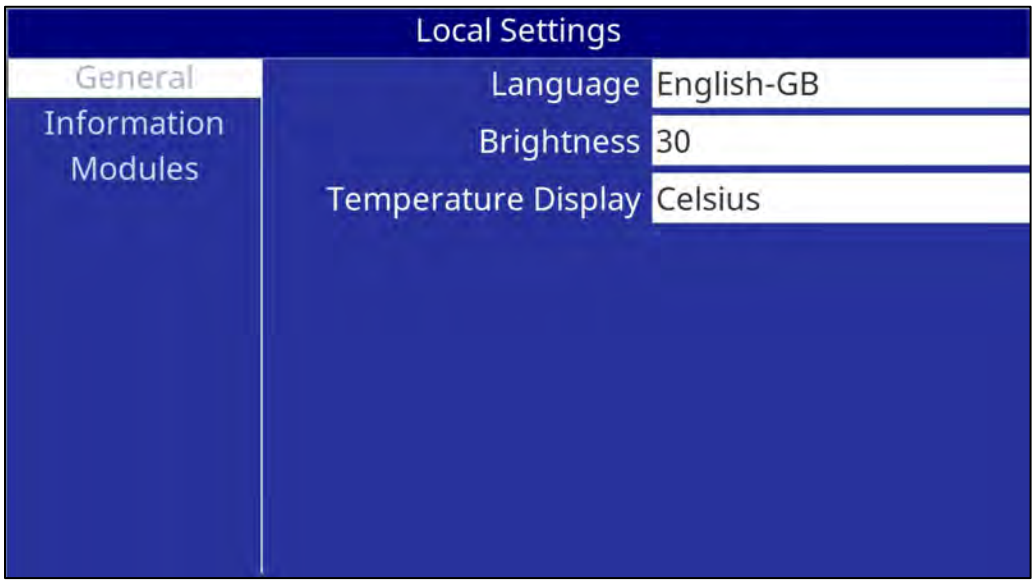


Figure 6-17 Local Settings page – General group

3. There are 3 groups of information in the left pane: **General**, **Information** and **Modules**.

4. The **General** group (Figure 6-17) includes the following settings:

   Language – selects the interface language for the analyser.

   Brightness – sets the screen brightness.

   Temperature Display – sets whether the internal temperature on the Gauge Diagnostics page is shown in Celsius or Fahrenheit.

5. The **Information** group (Figure 6-18) displays information about the analyser, including software version and build date, InfraLab TL UI IP Address, CPU load and time since the last reboot.

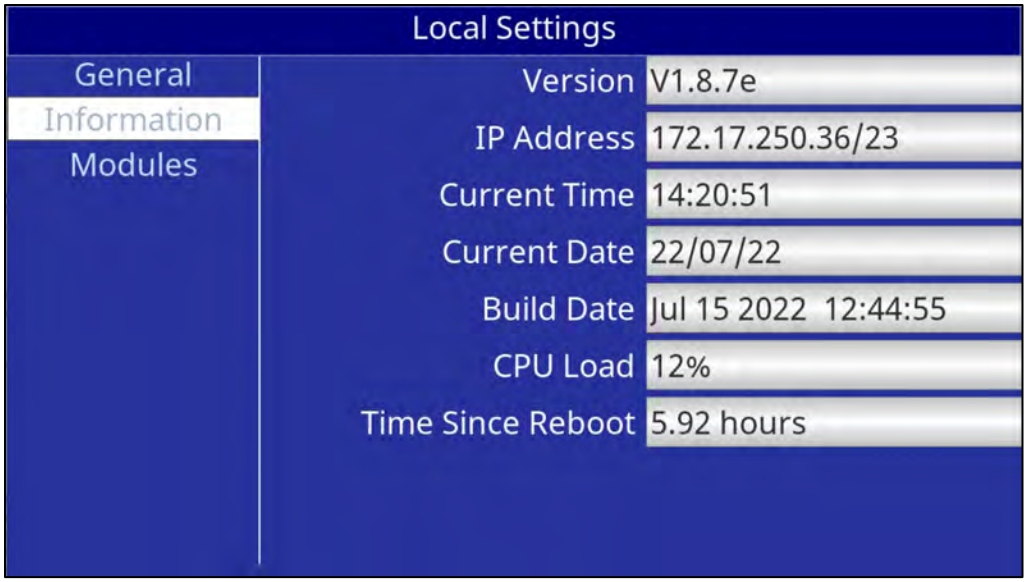


Figure 6-18 Local Settings – Information group

6.8 Setting the Date and Time

1. Touch the  **Configuration** button to bring up the Settings page.

2. Open the Set Date And Time page (Figure 6-19) by touching the buttons shown below.

   Hardware Settings > 

   Date/Time

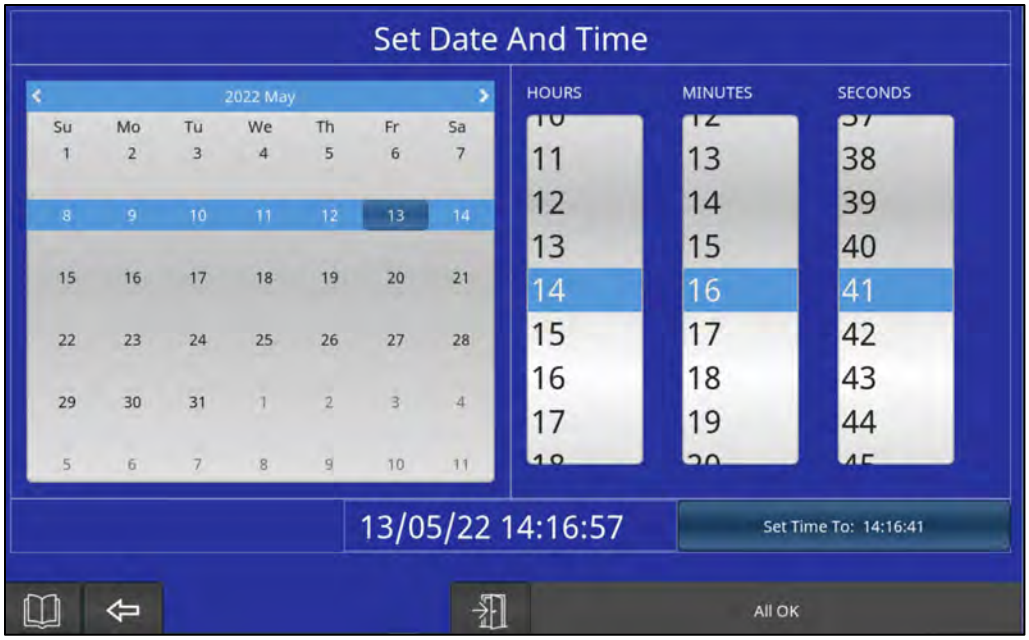


Figure 6-19 Set Date And Time page

The current date and time are displayed on the bottom of the page.

3. To change the date:

   a. Touch a date on the calendar.
   A **Set Date To <selected date>** button will appear.

   b. Touch the **Set Date To ...** button.

4. To change the time:

   a. Touch the **HOURS**, **MINUTES** and **SECONDS** lists to select the current time.

   b. Touch the **Set Time To ...** button.

6.9 Editing the Gauge and Measurement Names

The **Edit Names** function enables you to assign meaningful names to the InfraLab TL and to each of the measurement channels, in place of the factory defaults.

The assigned names are used throughout the control panel functions. In particular, they appear on the Sample page to identify the displayed measurements.

1. Touch the  **Configuration** button to bring up the Settings page.

2. Open the InfraLab Settings page (Figure 6-20) by touching the buttons below.

   Hardware Settings > 

   InfraLab Settings

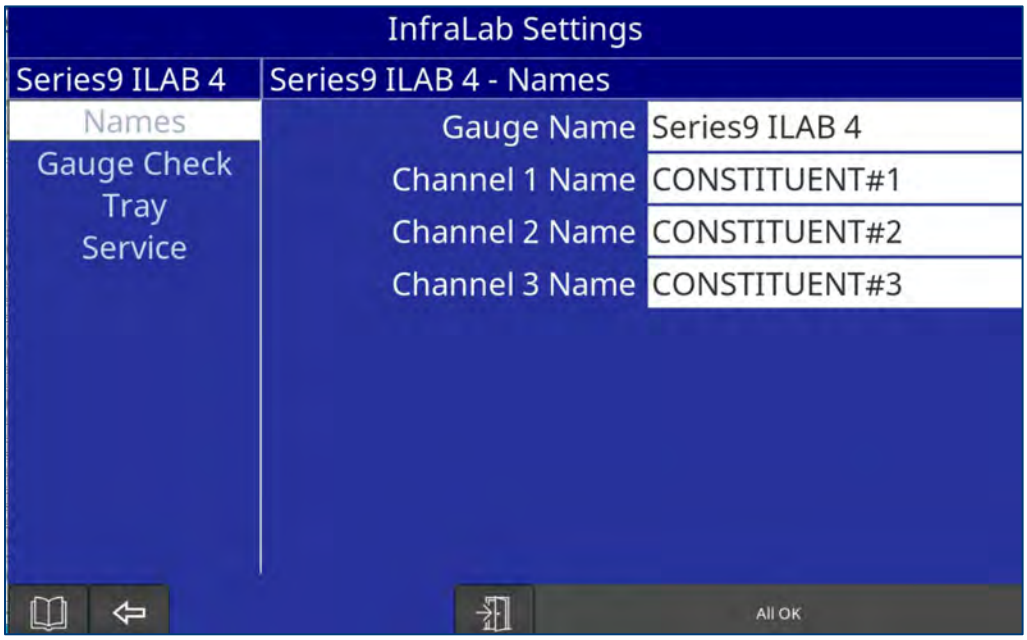


Figure 6-20 InfraLab Settings page – Names group

3. "**Names**" should already be selected in the left pane. The Gauge and Channel Names appear to its right. Enter new names as required for the gauge and any of the channels.

   It is common practice for:

   - the **Gauge Name** to reflect the analyser's position in the process (e.g. Dryer 1 Exit).
   - each **Channel Name** to represent the constituent being measured (e.g. Moisture or Fat).

6.10 Setting the Automatic Gauge Check Interval

Refer to Section 7.2.5 - Checking Analyser Stability for a description of the Gauge Check function.

Gauge checking can be carried out automatically, at regular intervals by following the procedure below.

1. Touch the  **Configuration** button to bring up the Settings page.

   Open the InfraLab Settings page (Figure 6-21) by touching the buttons shown below.

   Hardware Settings > 

   InfraLab Settings

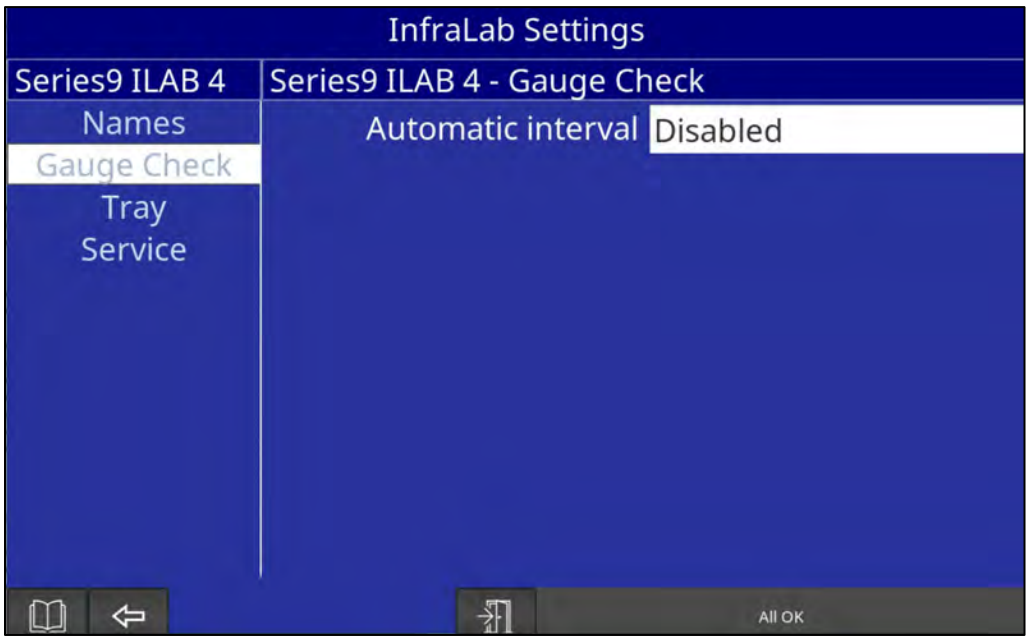


Figure 6-21 InfraLab Settings page – Gauge Check group

2. Select **Gauge Check** in the left pane.

3. By default, **Automatic interval** is set to Disabled. To enable automatic gauge checking, touch the **Automatic interval** box and select the interval for gauge checking.

6.11 Unlocking the Application

First, obtain an application unlock code, following the procedure in Section 4.6.1 - Obtaining the Application Unlock Code. Then, enter that code by following the procedure below:

1. Touch the  **Configuration** button to bring up the Settings page.

   Open the InfraLab Settings page (Figure 6-22) by touching the buttons shown below.

    **Hardware Settings >**  **InfraLab Settings**

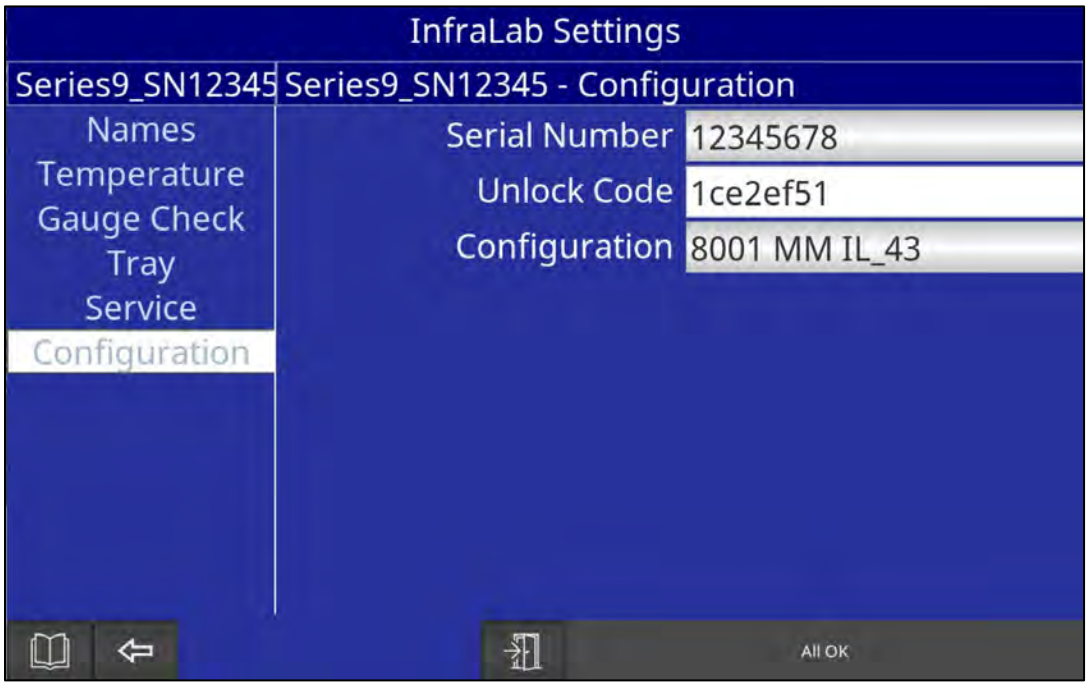


Figure 6-22 InfraLab Settings page – Configuration group

2. Select **Configuration** in the left pane.

3. Enter the unlock code from Section 4.6.1 - Obtaining the Application Unlock Code in the **Unlock Code** box on this page to complete setup of the gauge application files. The **Configuration** field on this page will update to reflect the installed application configuration.

6.12 Engineer-Only Functions

6.12.1 Configuring Users

An Engineer has the capability of:

- Modifying existing user settings
- Deleting users
- Adding new users

Note: A Supervisor also has the capabilities described above, but is not allowed to create Engineer users, either by creating a new user, or amending the user level of an existing user.

1. Touch the **Configuration** button to bring up the Settings page.

2. Touch the

Users button to bring up the User Settings page (Figure 6-23).
This page shows a list of current users and their associated settings.

3. To modify an existing user's settings or delete a user, select a user from the list.
Two buttons, **Edit** and **Delete**, will appear. Follow the instructions in Section 6.12.1.1 - Editing a User and Section 6.12.1.2 - Deleting a User.

Figure 6-23 User Settings page

4. To add a user, touch the **Add** button.
   Follow the instructions in Section 6.12.1.3 - Adding a User.

6.12.1.1 Editing a User

To edit an existing user's settings:

1. Select the user from the list on the User Settings page (Figure 6-23).

2. Touch the **Edit** button, and the Edit User Settings page will appear (Figure 6-24).

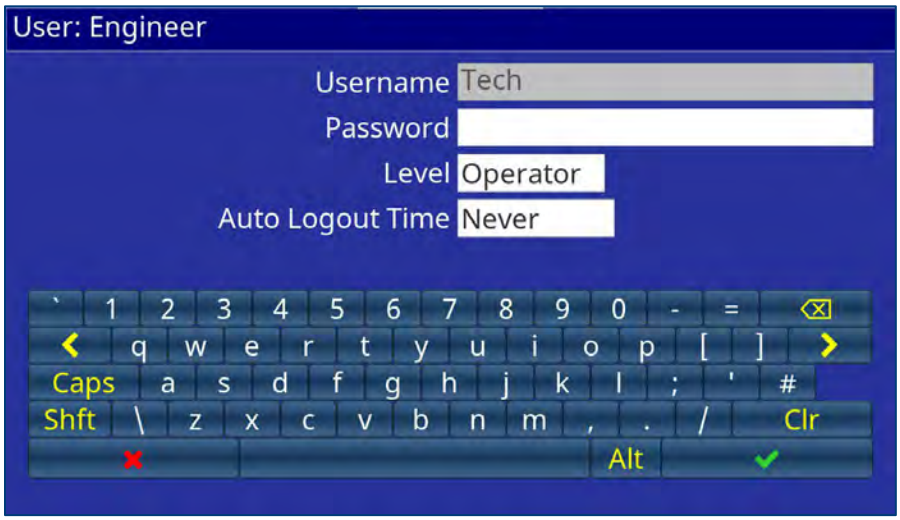


Figure 6-24 Edit User Settings page

3. Use the keypad provided to enter a new password for the user. You may also select a different user **Level** and/or **Auto Logout Time** for the user.

4. When done modifying the settings, touch the  button.

6.12.1.2 Deleting a User

To delete an existing user:

1. Select the user from the list on the User Settings page (Figure 6-23).

2. Touch the **Delete** button and select **Yes** to confirm.

6.12.1.3 Adding a User

To add a user:

1. Touch the **Add** button on the User Settings page (Figure 6-23).

The Add User Settings page will appear (Figure 6-25).

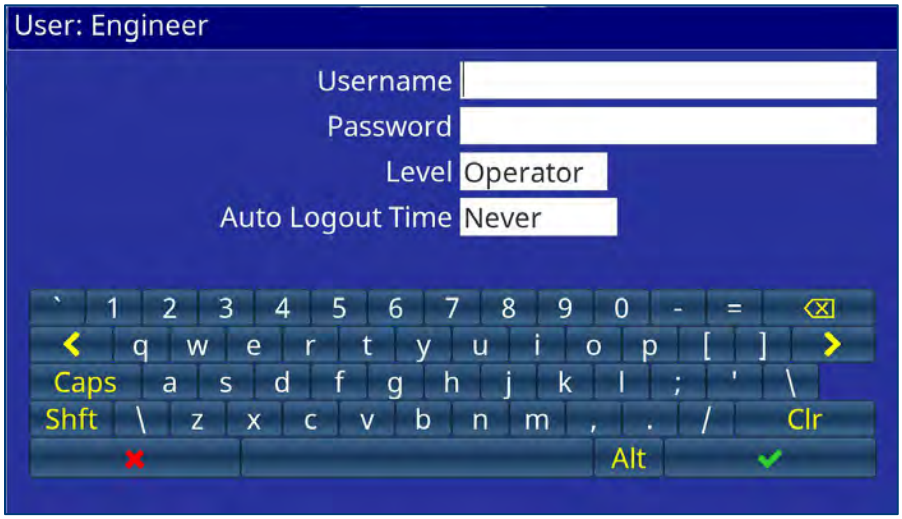


Figure 6-25 Add User Settings page

2. Enter the new user's name in the **Username** box.

3. (Optional) Enter a password in the **Password** box.

4. Select the user's **Level**: Operator, Supervisor or Engineer.

5. Select the **Auto Logout Time** (the time after which the user is automatically logged off when there is no screen activity): Never, 5 minutes, 10 minutes or 30 minutes.

6. Touch the  button.

6.12.2 Linking the Display

This function is normally a once-only process to link the InfraLab TL control panel display to its gauge. It will only need to be repeated in the event of hardware changes.

1. Touch the  **Configuration** button to bring up the Settings page.

2. Touch  **Hardware Settings >**  **Link Display** to open the Gauge Selection page (Figure 6-26).

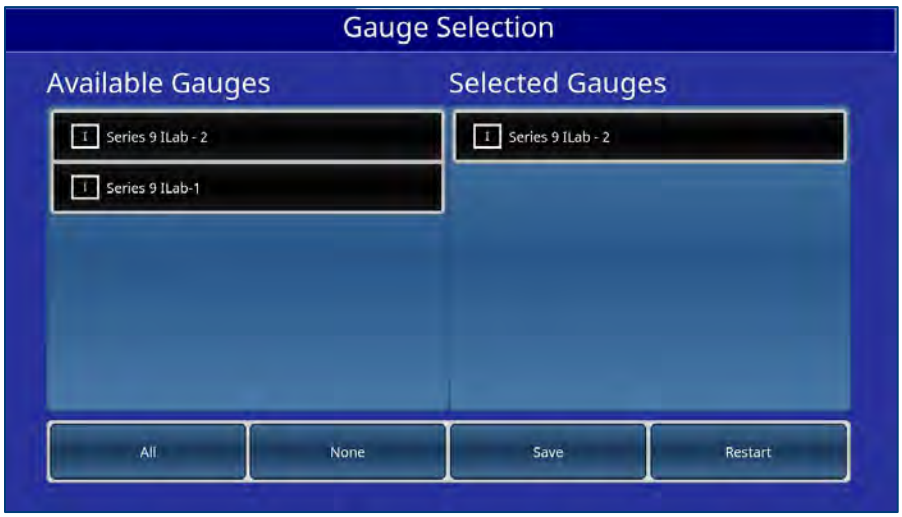


Figure 6-26 Gauge Selection page

3. Two lists are displayed: **Available Gauges** list on the left shows a button for each available gauge. The **Selected Gauges** list on the right shows the gauge that has been selected.

   (**Caution:** If there is more than one Ethernet connected InfraLab TL on the same network, it is possible for the Control Panel of one InfraLab TL to see and connect to the gauge of another InfraLab TL.)

4. To select a gauge, touch the associated gauge's button in the **Available Gauges** list, and the selected gauge will appear in the **Selected Gauges** list.

5. To remove a gauge from the list of selected gauges, touch its button in the **Selected Gauges** list. Alternatively, touch the **None** button to remove all gauges from the **Selected Gauges** list.

6. When completed making the selection, touch the **Save** button, then touch the **Restart** button to restart the InfraLab TL.

6.12.3 Configuring Network Settings

Notes:

1. The IP Address of the InfraLab TL gauge is shown on the Gauge Status page (see Section 5.1.3 - Responding to Error Messages).

2. The IP Address of the InfraLab TL UI is shown by selecting **Information** from the left pane of the Local Settings page (see Section 6.7 - Local Settings).

To set the IP Address and other network settings for the InfraLab TL gauge or UI:

1. Touch the  **Configuration** button to bring up the Settings page.

2. Touch  **Hardware Settings >**  **Configure Network** to open the Network Settings page for the InfraLab TL (Figure 6-27).

Figure 6-27 Network Settings page

3. Select either the InfraLab TL gauge or UI from the **Select Device** list on the top.

4. If the IP settings will be assigned automatically, touch the **Automatic IP Address** box. That box will change to blue to indicate it has been selected.

5. Otherwise, to manually enter the IP settings for the InfraLab TL gauge or UI:

   a. Touch the **Manual IP Address** box.
   That box will change to blue, to indicate that it has been selected.

   b. Individually touch each of the four fields that are separated by periods, and use the keypad on the right to enter the **IP Address**, **Subnet mask** and **Default Gateway** settings for the analyser.

   c. When done entering the values, touch the **OK** button on the keypad.

6.12.4 Configuring USB Devices

This function displays information about each connected USB device.

1. Touch the **Configuration** button to bring up the Settings page.

2. Touch **Hardware Settings >** **USB Settings** to open the USB Settings page (Figure 6-28).

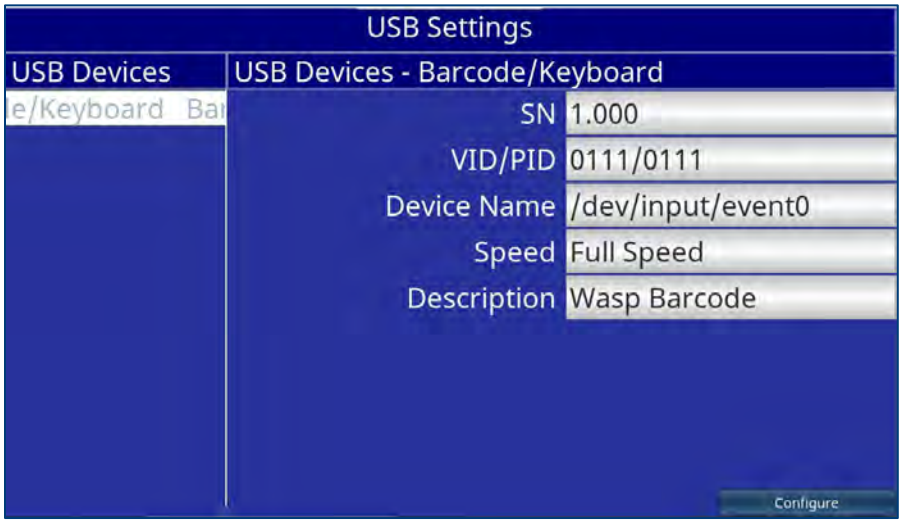


Figure 6-28 USB Settings page

This page shows the USB device characteristics, including the device name and description.

6.12.4.1 Configuring Barcode Readers

After connecting one or more barcode readers, it/they must be assigned to one or more of three functions so that the analyser can use the barcode data appropriately.

1. Touch the **Configuration** button to bring up the Settings page.

2. Touch **Hardware Settings >** **USB Settings** to open the USB Settings page (Figure 6-28).

3. Touch the **Configure** button to bring up the USB Device Configuration page (Figure 6-29).

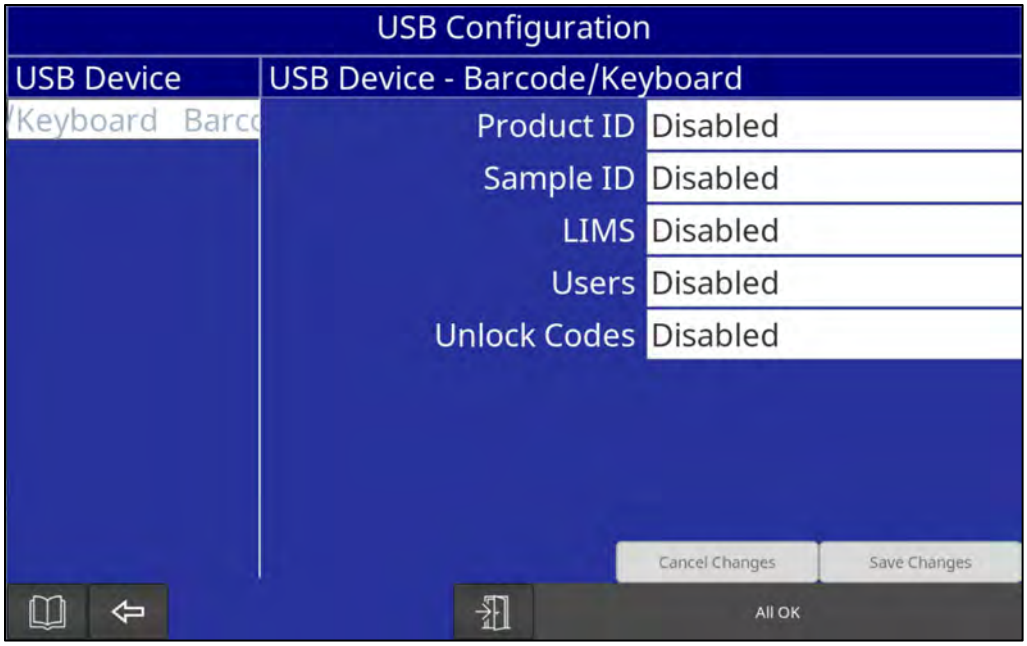


Figure 6-29 USB Device Configuration page

This page enables any connected barcode reader to be assigned to one or more of the listed functions:

- **Product ID**

  If set to Enabled, the barcode information provides the product name when loading a product.

- **Sample ID**

  If set to Enabled, the barcode information is read into the sample ID field when taking a new sample.

- **LIMS**

  If set to Enabled, barcodes are sent out via the LIMS interface (Laboratory Information Management System) as a LIMs event.

- **Users**

  If set to Enabled, when the InfraLab TL log in page (Figure 5-3) is currently displayed, if a barcode matches an existing username, then that user is automatically logged in.

- **Unlock Codes**

  If set to Enabled, when the InfraLab Settings page – Configuration group (Figure 6-22) is currently displayed, the barcode information provides the application unlock code.

6.12.4.2 USB Flash Memory Drives

The InfraLab TL Series 9 supports both standard and BitLocker encrypted flash memory drives.

Standard Flash Drives

To view USB settings for a standard (non-encrypted) flash drive:

1. Touch the  **Configuration** button to bring up the Settings page.
2. Touch  **Hardware Settings >**  **USB Settings** to open the USB Settings page (Figure 6-30).

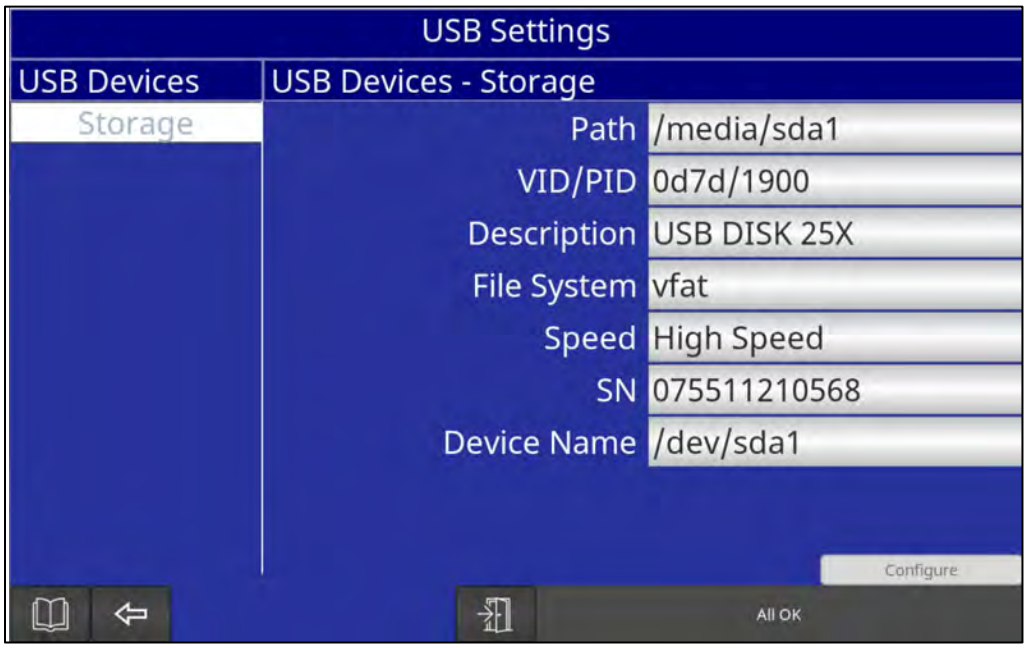


Figure 6-30 USB Settings page – standard flash drive

BitLocker Encrypted Flash Drives

A USB flash drive is made BitLocker encrypted using a Windows PC. Right-click on the USB in File Explorer and select **Turn BitLocker on** (Figure 6-31).

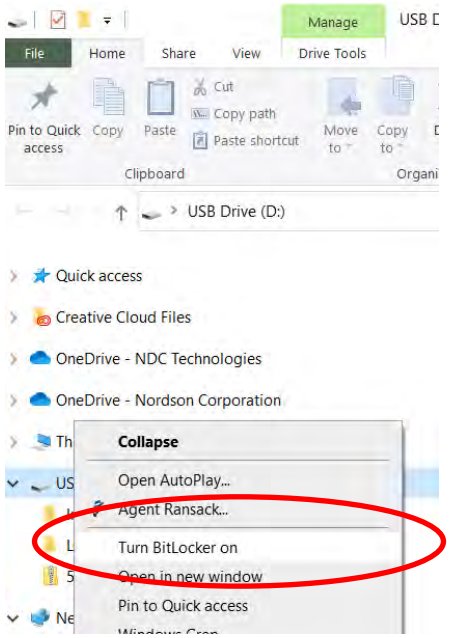


Figure 6-31 Select Turn BitLocker on in File Explorer

To view USB settings for a BitLocker encrypted flash drive:

1. Touch the  **Configuration** button to bring up the Settings page.

2. Touch  **Hardware Settings >**  **USB Settings** to open the USB Settings page (Figure 6-32).

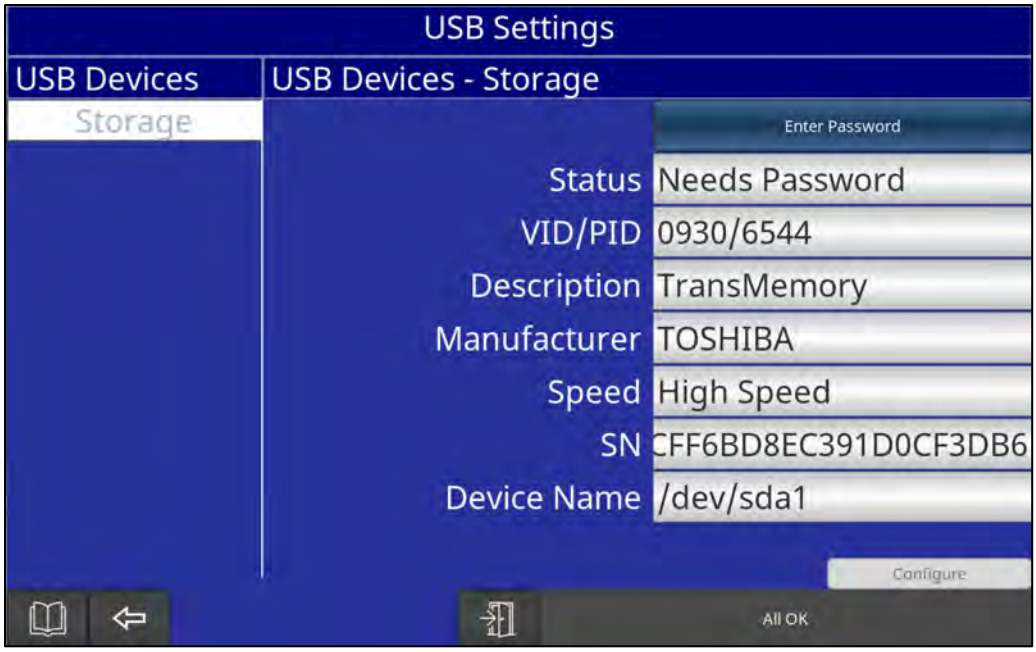


Figure 6-32 USB Settings page – BitLocker encrypted flash drive

3. Touch the **Enter Password** button and enter the password for the USB (Figure 6-33).

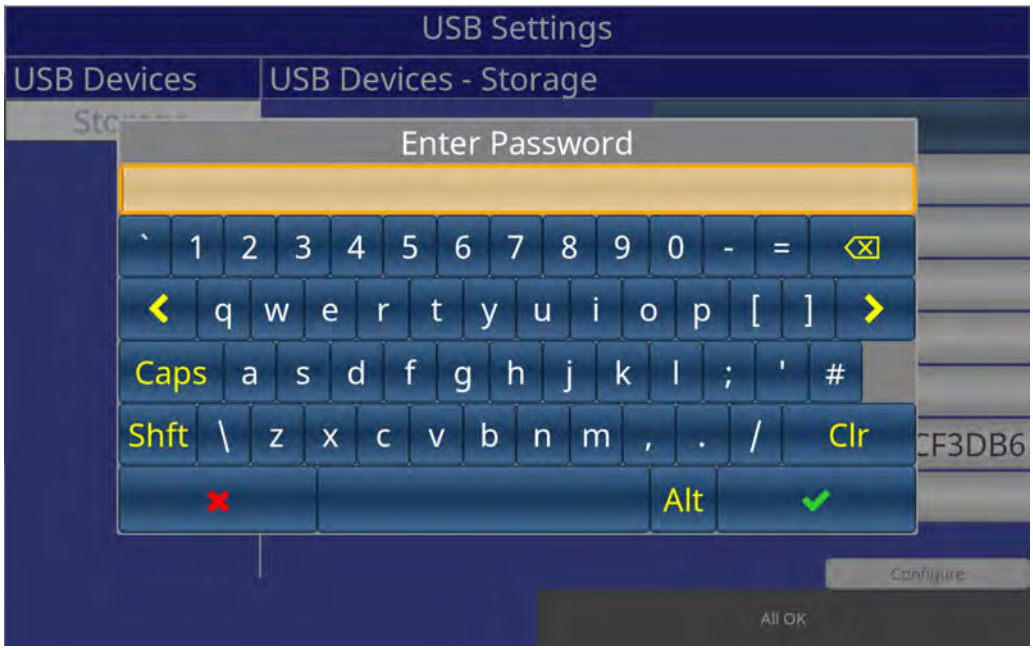


Figure 6-33 Enter password for USB

4. After the password is entered, the Status on the USB Settings page displays “Mounting” while the USB is being mounted (Figure 6-34). Note that this can take 1 to 2 minutes.

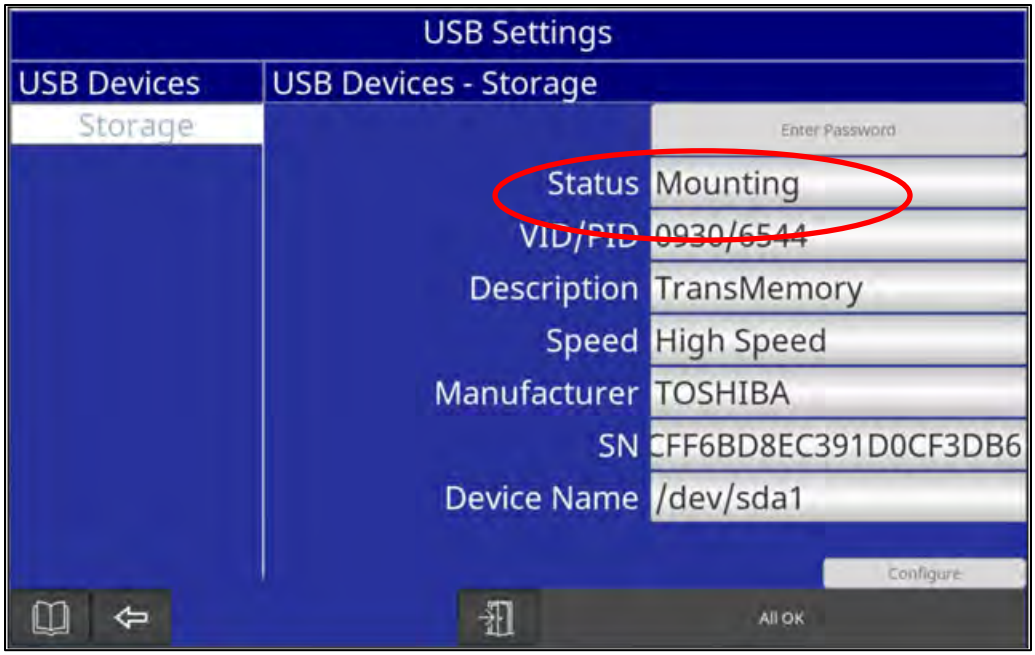


Figure 6-34 Status shows Mounting

5. Once the Status is reported as “Mounted” (Figure 6-35), the USB can be used to save sample records and the Audit Trail (see Section 5.5 - Exporting Samples to a USB Mass Storage Device and Section 5.6 - Audit Trail).

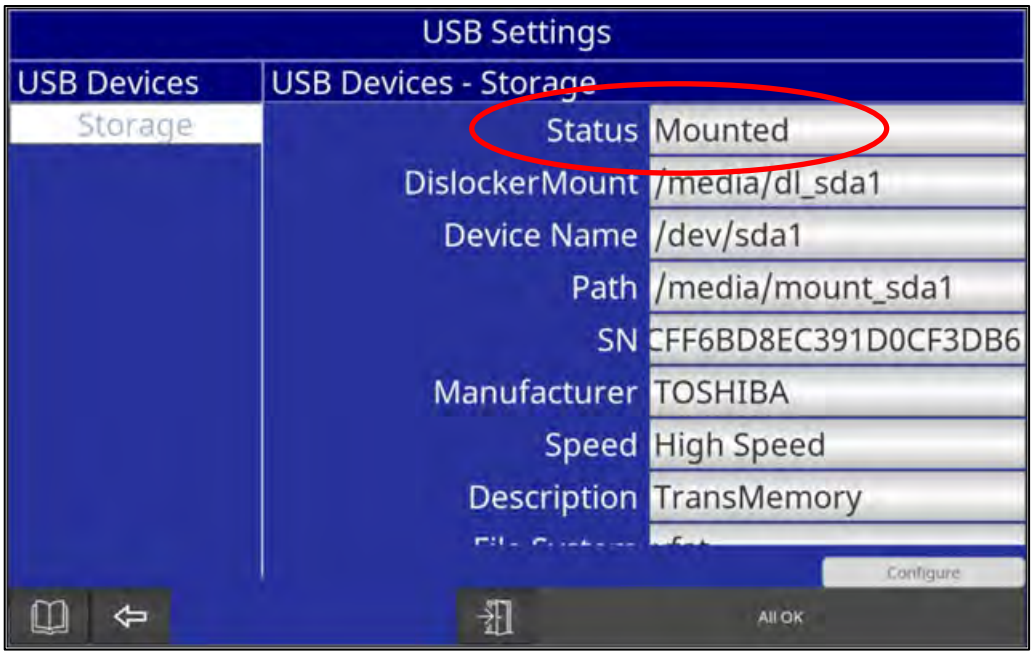


Figure 6-35 Status shows Mounted

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CHAPTER 7

7 Calibration

7.1 Calibration Overview

InfraLab TL analysers are configured and pre-calibrated during manufacture to suit the specific applications for which they are supplied. Consequently, a new InfraLab TL can normally be put into service immediately, subject only to verifying the calibration.

The InfraLab TL should then be stable and provide consistently accurate measurements over long periods. However, if you wish to check the stability of the InfraLab TL output at any time, this can be done using the external Auto Reference Standard (ARS) or the Gauge Check function (see Section 7.2.5 - Checking Analyser Stability).

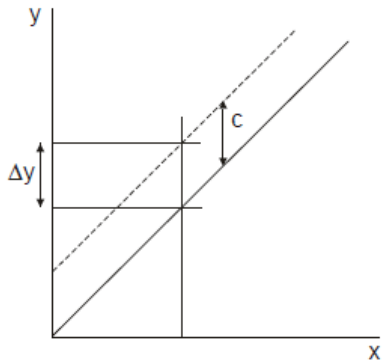
Calibration requirements of InfraLab TL analysers are limited to adjustment of the output using Trim and Span values only.

Trim

The Trim value applies a positive or negative offset to the final output. It can be adjusted to increase or decrease the analyser output to align with the local laboratory reference method values.

In most circumstances, this is sufficient calibration for an analyser measuring at a target value. Even if the pre-calibrated Span is not optimum for the product over a wider measurement range, making a Trim-only adjustment will produce high-accuracy results at or near the target with minimum effort.

The default Trim value is 0.00. The graph shows the effect (Δy) on the analyser output of a change in Trim value.

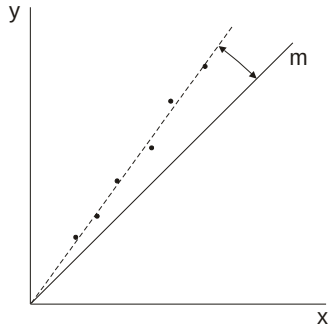


c = Trim	x = Laboratory reference	y = Analyser output

Span

The Span value changes the slope of the analyser output: that is, the change in output for any given change in absorption by the measured product. For some applications, Span adjustment may be needed to align the analyser measurements with laboratory reference samples over a range of values, as illustrated below. In such cases, it is necessary to perform a full-range calibration.

The default Span value is 1.00.



m = Slope of line	x = Laboratory reference	y = Analyser output

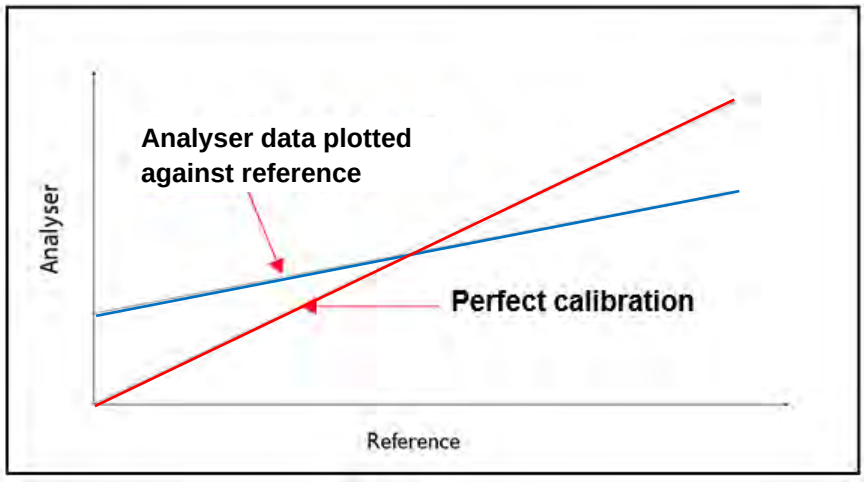
Example

The following example illustrates how the Span and Trim adjust the calibration.

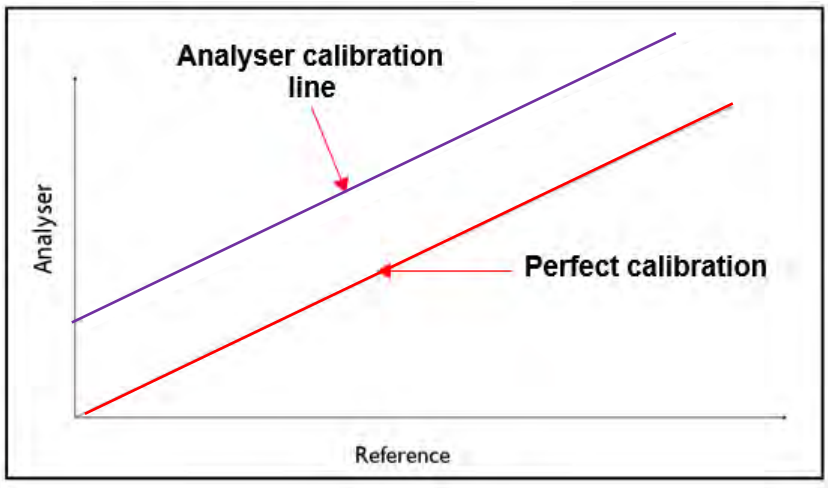
The figure below shows 2 lines:

- The red line is the perfect calibration
- The blue line is the analyser data that was collected and plotted against the reference method.

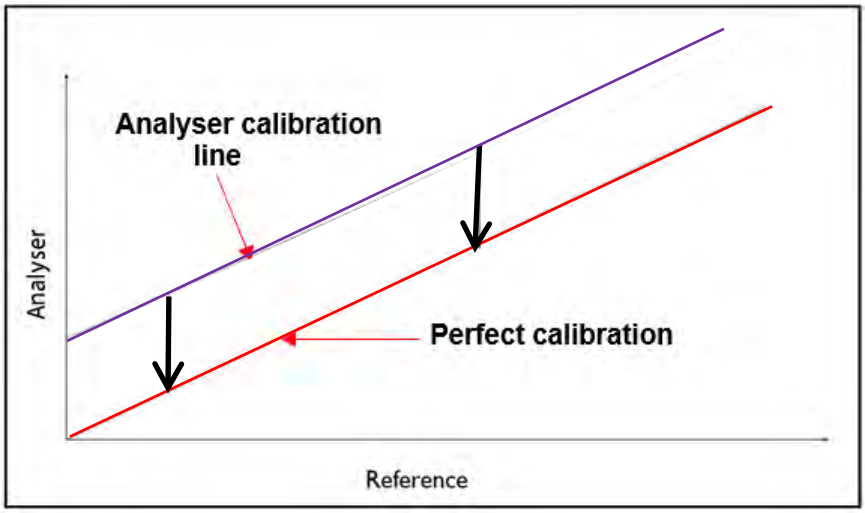
  The analyser is reading high at the low end, and low at the high end. Therefore, the Span needs to be adjusted.



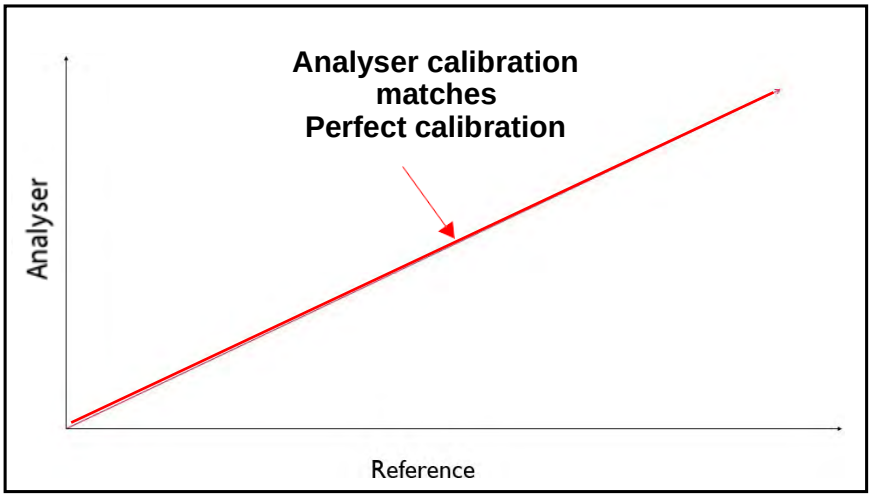
The Span changes the measurement sensitivity. The analyser calibration line is now at the same sensitivity as the perfect calibration (same gradient).



The next step is to move the analyser calibration line down the Y-Axis so that the readings lie on the perfect calibration line. This is done by adjusting the Trim.



Finally, the calibration data matches the perfect calibration line. The analyser is calibrated and therefore, validation can now take place.



7.1.1 When to Calibrate

When	What you should do	Notes
• **After installing a new analyser**	• Internal reference the analyser (see Section 7.2.3 - Internal Referencing the Analyser)	This is essential. Do not omit.
	• Auto-trim (see Section 7.2.1 - Using Auto-Trim)	Optional. Can make the fine Trim adjustment easier to perform, but not essential.
	• Trim (see Section 7.2.2 - Trim)	Essential. Ensures measurements at/near target are accurate.
	• Full range calibration (see Section 7.2.4 - Performing Full-Range Calibration)	Necessary only if accurate measurements are required over a range of values.
• **After changing source lamp or filter wheel motor**	• Internal reference the analyser (see Section 7.2.3 - Internal Referencing the Analyser)	Essential.
• **On change of product**	• Check trim against samples of new product and adjust if necessary	Confidence check.
• **Whenever check of long-term accuracyis required**	• Stability check (see Section 7.2.5 - Checking Analyser Stability)	Confidence check.

7.2 Calibration Procedures

7.2.1 Using Auto-Trim

The Auto-Trim function is intended as an initial method of adjusting the analyser to provide approximately correct outputs at the target values. It is very quick and easy to use, and does not require the preparation of special laboratory samples.

Auto-Trim should not be used in place of the Trim procedure (see Section 7.2.2 - Trim) where accurate analyser readings are required.

The values obtained using Auto-Trim automatically update the current analyser products (see Section 6.4 - About Products).

1. Touch the  **Configuration** button, then touch 

Configure Products to bring up the Configure Products page (Figure 7-1).

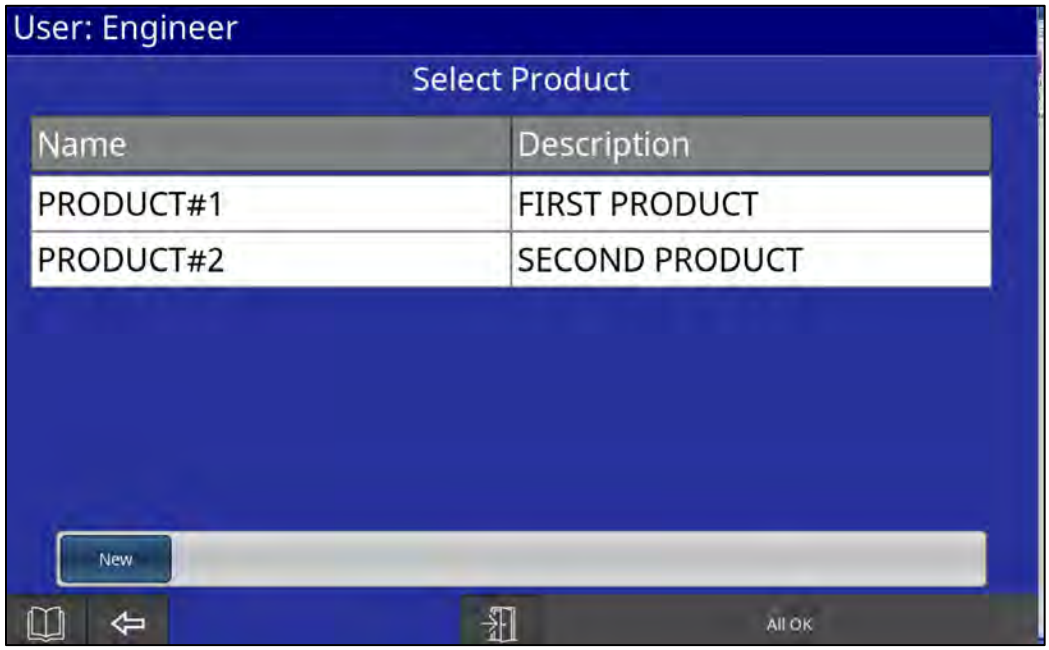


Figure 7-1 Configure Products page

2. The Select Product table lists all available products, along with a description.

   Select a product from the list. This will cause a number of buttons, including the **Auto Trim** button, to appear below the product list (Figure 7-2).

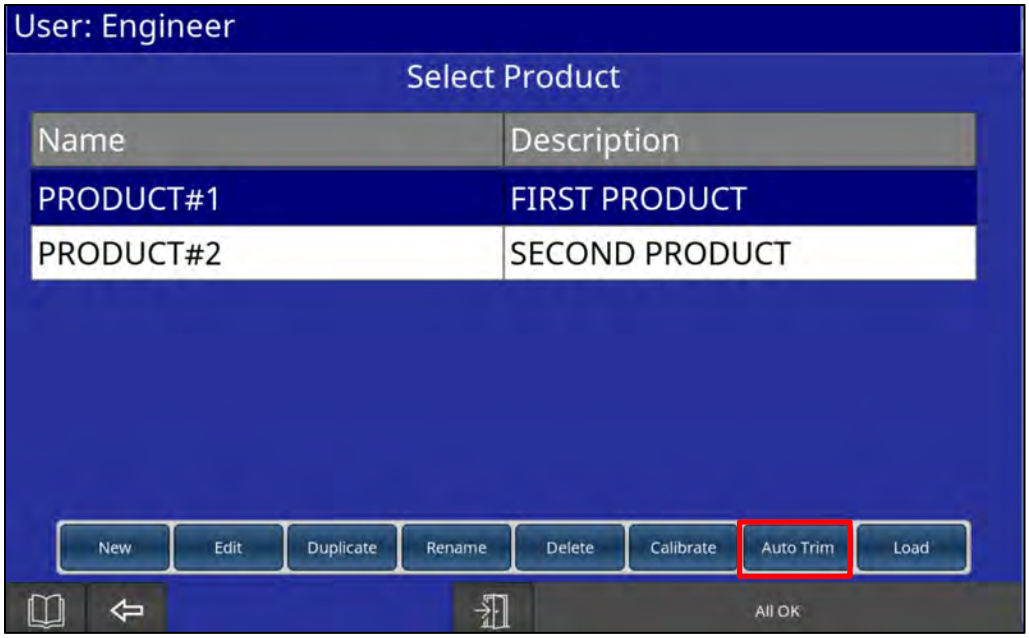


Figure 7-2 Configure Products page after selecting a Product

3. Touch the **Auto Trim** button.

   This will bring up the Auto Trim page, showing the continuous reading from each analyser channel (Figure 7-3).

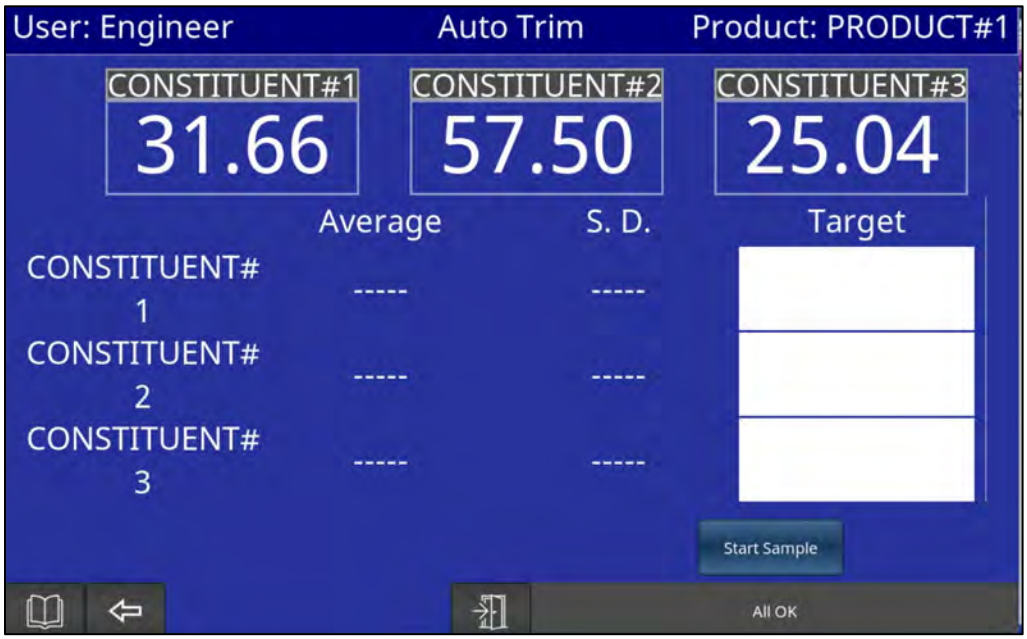


Figure 7-3 Auto Trim page

4. Touch the **Start Sample** button.

5. The analyser will start sampling the product for 10 seconds. An indicator bar will appear, showing the progress of sampling (Figure 7-4). While this is occurring, a **Cancel Sample** button is also visible, which, if touched, will abort the sampling process.

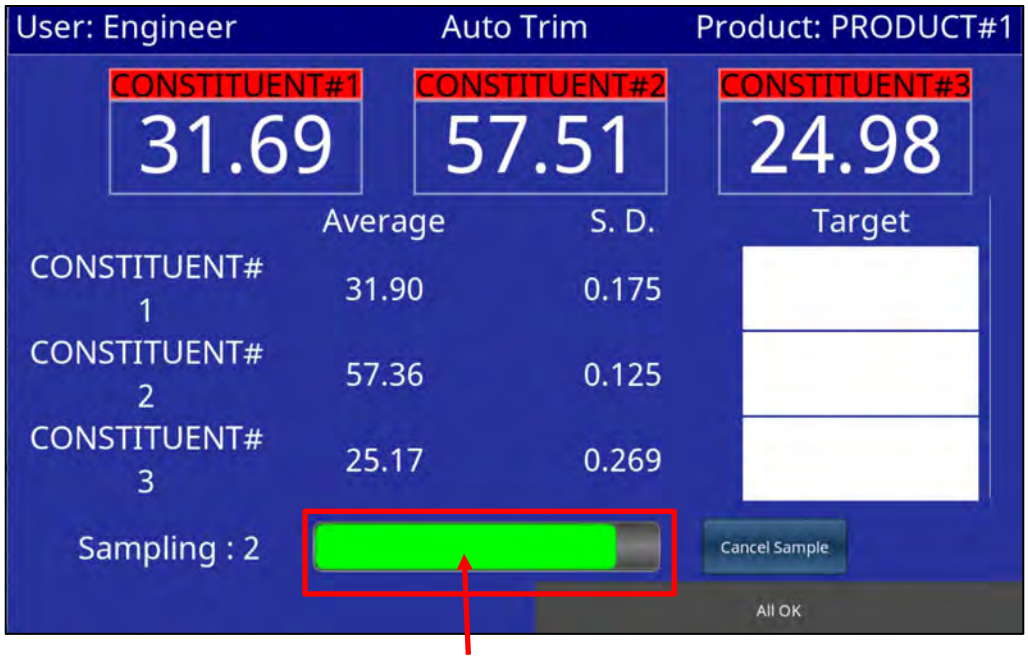


Figure 7-4 Sampling in progress

6. When sampling is completed, the final average and standard deviation (S.D.) of the sampled values will remain on the screen (Figure 7-5). Enter the target value in the **Target** box and touch the **Apply** button.

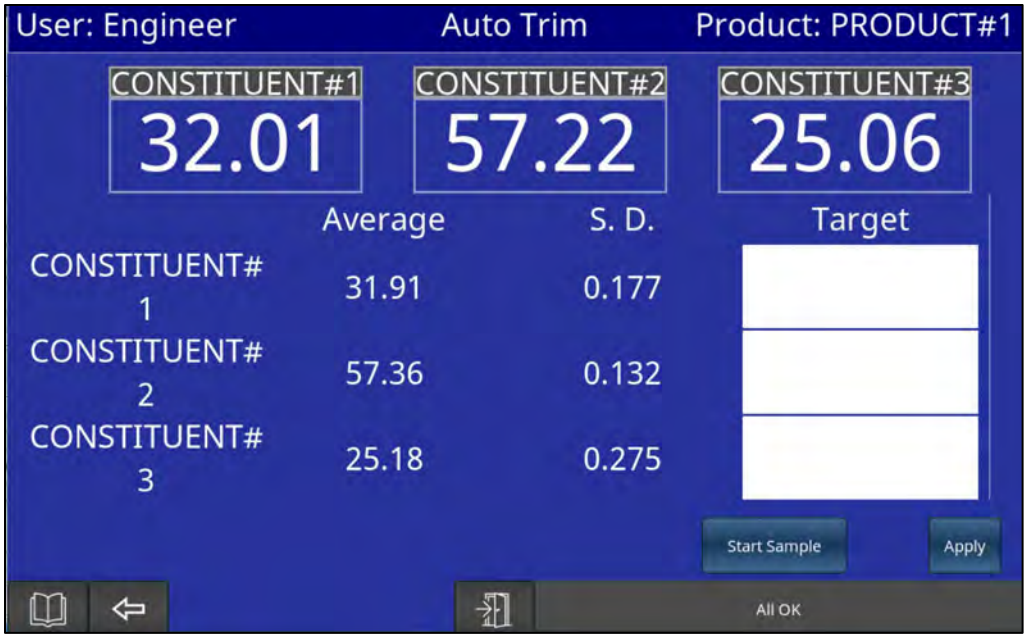


Figure 7-5 Sampling completed

7. Touch the **Apply** button to apply the calculated trim automatically, and the trimmed measurement will update on the screen.

7.2.2 Trim

The Trim function is used in calibration procedures to align the InfraLab TL measurements with values obtained using laboratory reference samples.

A manual Trim adjustment is conducted in two distinct phases:

- Obtaining the sample data on which the new trim value will be based.
- Calculating and applying the new Trim value to update the stored analyser products.

These are described below.

7.2.2.1 Obtaining Samples and Calibration

This process involves taking a number of InfraLab TL analyser readings and the corresponding laboratory reference samples with the product at or near the target values. Data from these samples can then be used to determine the optimum analyser Span and Trim values.

1. Follow the procedure in Section 5.3 - Taking Samples to collect a sample.
2. After sampling is completed, the displayed values can be saved for comparison with the laboratory-determined values by touching the **Save Sample** button. If the sample is saved, it will be added into the Calibration Tool for the active Product. (Touching the **Discard Sample** button will cause those values to be discarded. If the sample is discarded, the Sample ID will not increment.)

   When collecting an analyser sample using the Sample function, the Span and Trim values being used at the time are recorded. The Calibration Tool uses the stored Span and Trim values to re-calculate each data point to allow all sample data with reference values collected for the selected Product to be included in the calibration calculation.
3. Repeat steps 1-2 multiple times (typically 10) to obtain a representative collection of analyser readings and corresponding reference samples.
4. Process the reference samples according to your established laboratory method to obtain the reference values.
5. You can use the embedded calibration tools to adjust the analyser reading to your laboratory reference method.
6. To use the Calibration Tool, you must login as either the Supervisor or Engineer:
   - There must be sample data collected and saved to the associated Product.
   - A minimum of 5 data points – with reference values – are required for the Calibration Tool to calculate new calibration settings.

7. Touch the  **Configuration** button, then touch  **Configure Products**.

8. Select the required product, then press **Calibrate** (Figure 7-6).

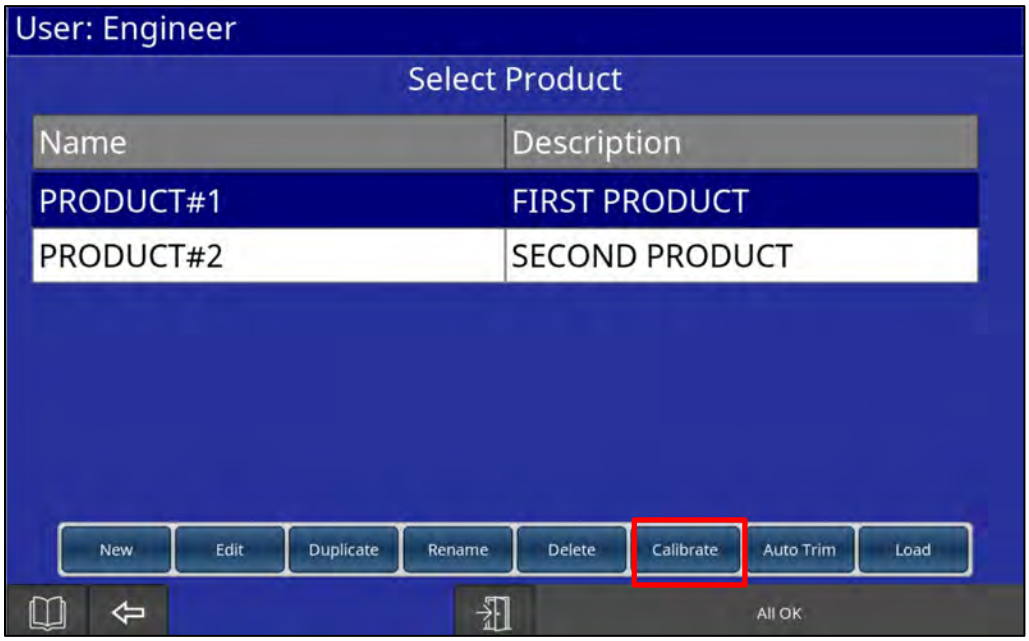


Figure 7-6 Press Calibrate button

9. The Calibration page for the selected product will show a list of samples (Figure 7-7).

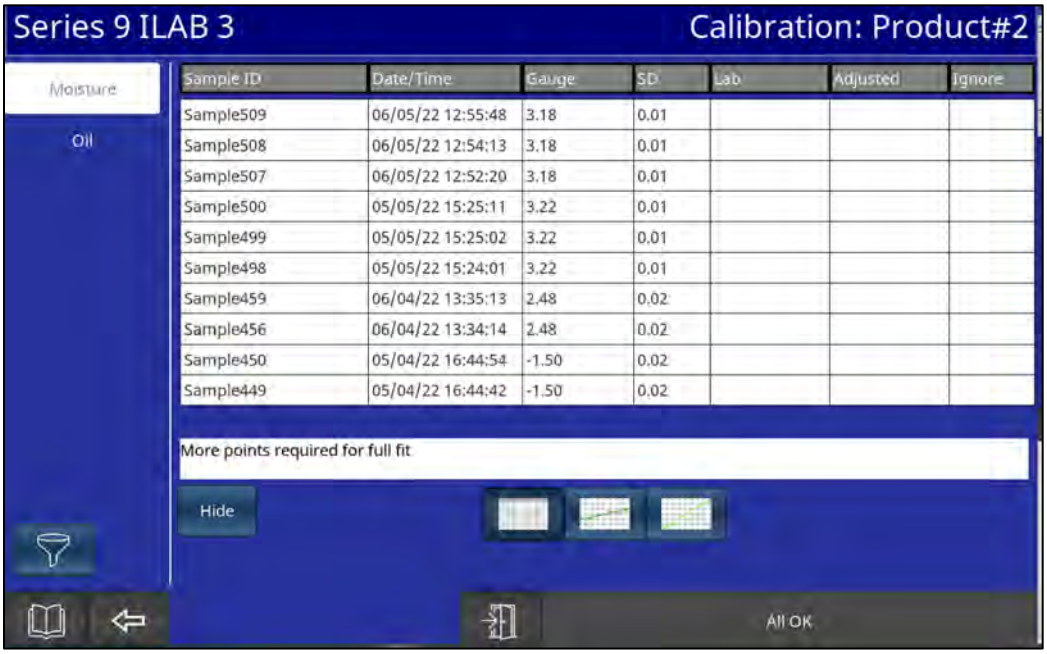


Figure 7-7 Calibration page

Hide/Show Button

The **Hide/Show** button is used to hide/show samples that have Lab reference values. Initially, the **Hide** button is visible on the Calibration page, and all samples, including those with Lab reference values, are shown (Figure 7-8).

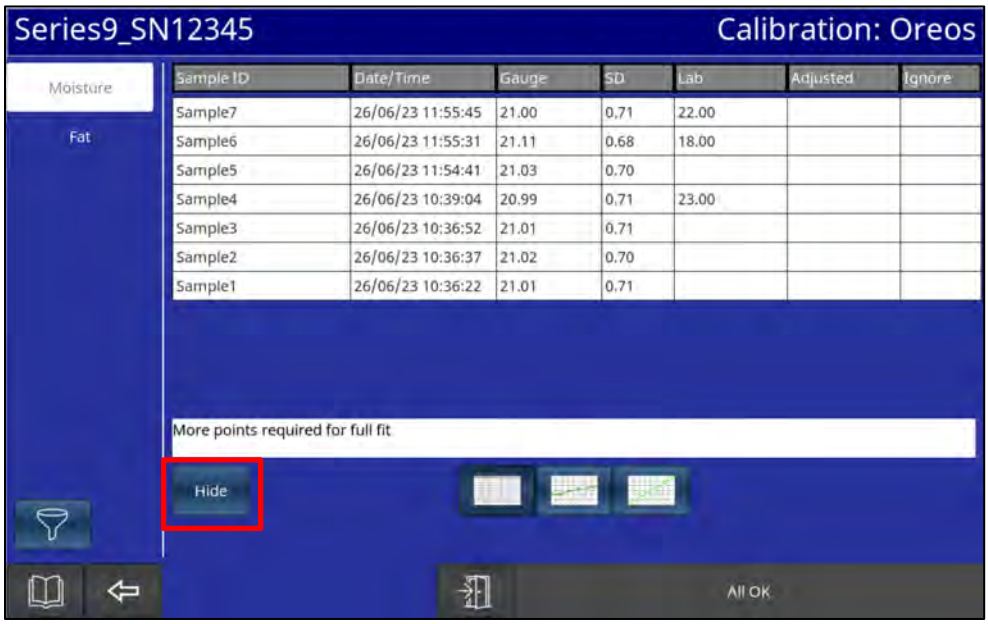


Figure 7-8 Calibration page shows all samples

When the **Hide** button is touched, the **Show** button appears in its place, and now the Calibration page does not show the samples that have Lab reference values (Figure 7-9). Touching the **Show** button will re-display those samples.

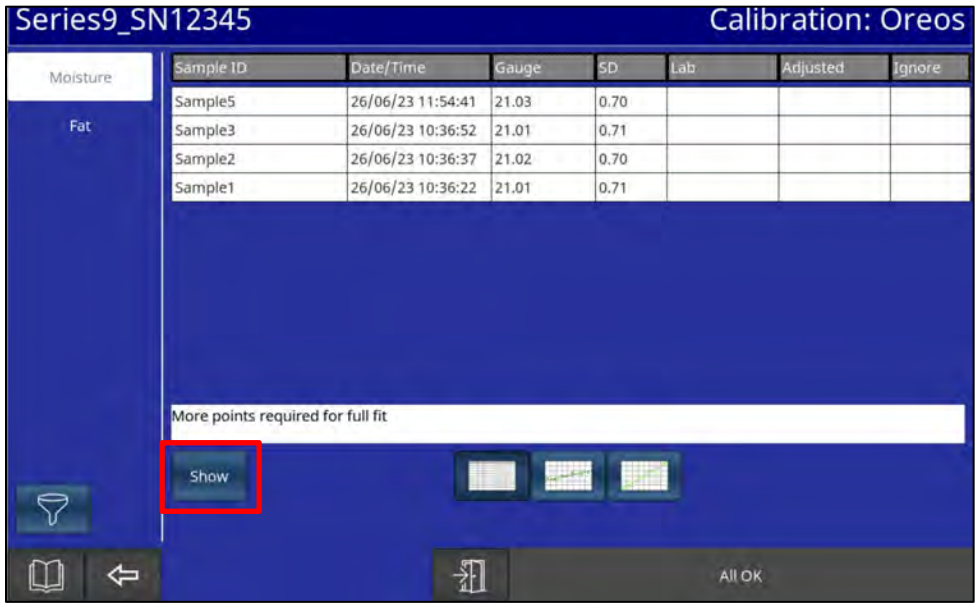


Figure 7-9 Calibration page does not show samples that have Lab reference values

Filtering Samples

The samples shown can be filtered by pressing the  **Filter** button. The following settings are available from the Sample Filter dialog (Figure 7-10):

Select Samples – Two options are available:

- **Lab Values Only** – display only samples that have Lab reference values defined (no date filter). Note that with this filter mode selected, new samples will not be shown as they do not have a Lab reference value.

- **Lab Values and Filtered** – display only samples that have Lab reference values defined or satisfy the selected date range entered below.

Date – This box applies when **Select Samples** is set to **Lab Values and Filtered** above. It sets the date range of samples to display (Custom, 24 hours, 3/7/14 days or 3 months). If **Custom** is selected, boxes will appear below for selecting the **Start** and **End Dates** (Figure 7-11).

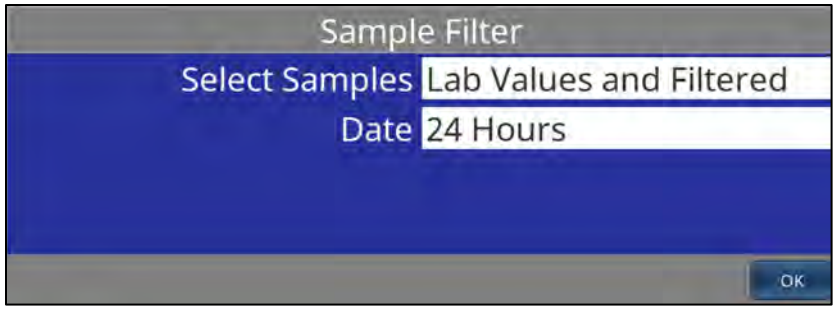


Figure 7-10 Sample Filter dialog with 24 Hour Date range selected

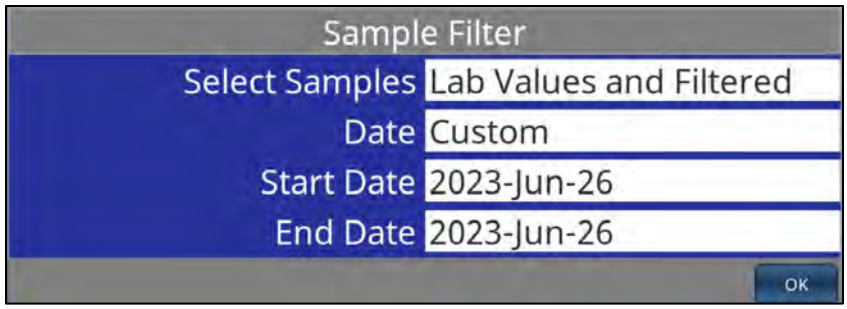


Figure 7-11 Sample Filter dialog with Custom Date range selected

10. Enter the laboratory reference value into the **Lab** column:

    a. Select the corresponding cell - the box will highlight in red (Figure 7-12).

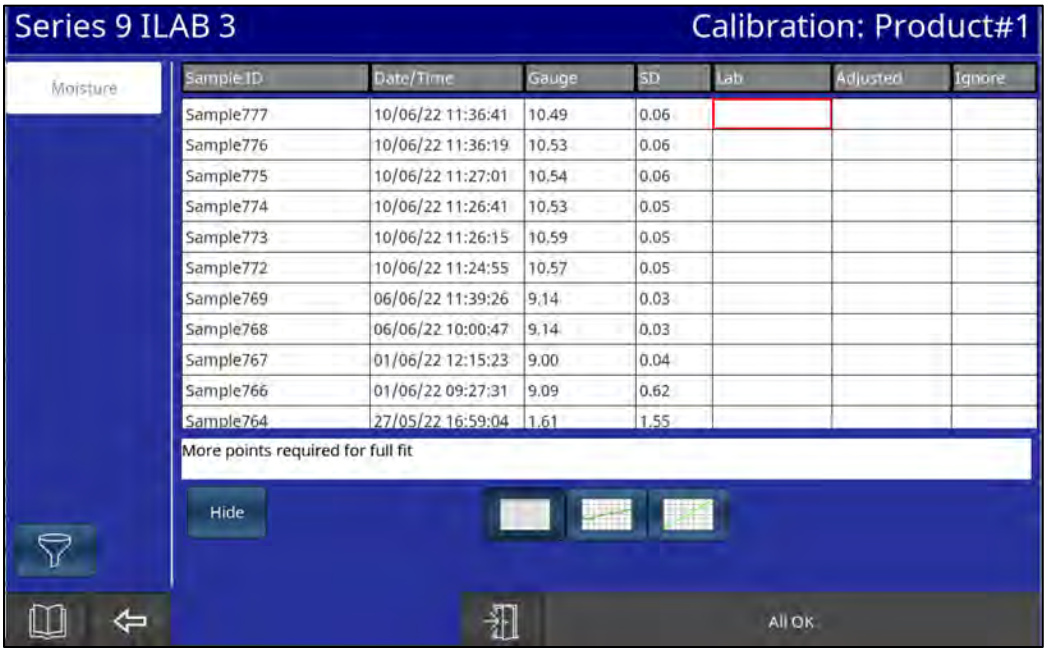


Figure 7-12 Lab cell highlighted in red when selected

b. Select the cell again and enter the lab value (Figure 7-13).

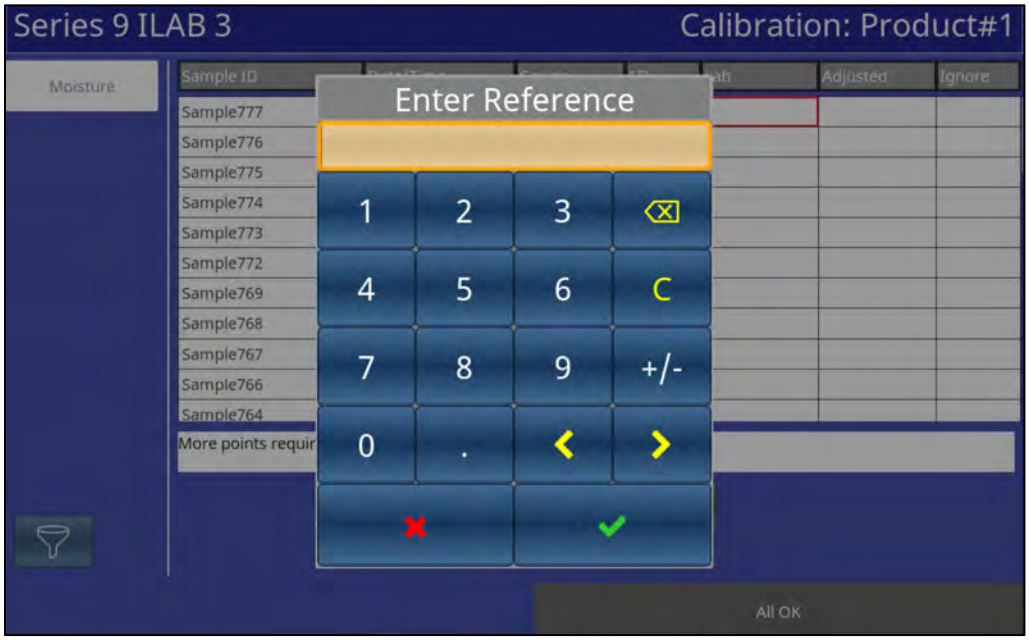


Figure 7-13 Enter lab value

c. Repeat for the other component measurements.

11. As soon as 5 reference values have been entered into the table, the Calibration Tool will fill in the **Adjusted** column with the data re-calculated to the suggested calibration settings (Figure 7-14). Press the **Apply** button to apply the Span/Trim change.

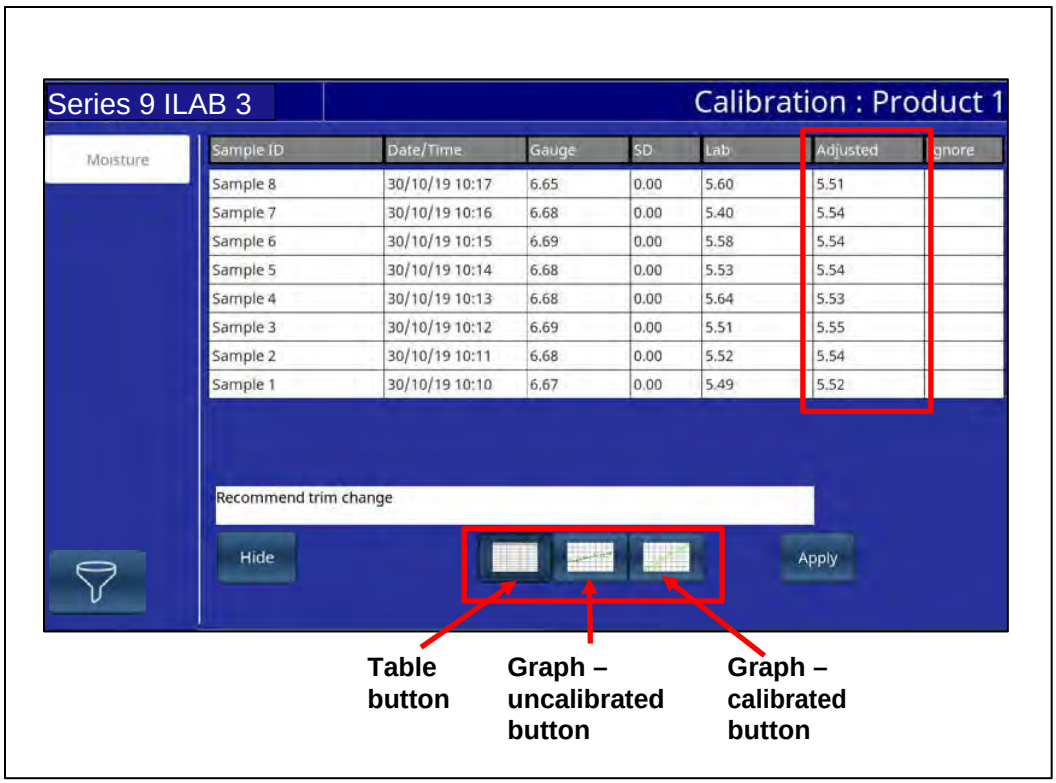


Figure 7-14 Adjusted column shows re-calculated data

12. Three new buttons will appear next to the **Table** button when 5 or more reference values have been entered (Figure 7-14):

    - **Graph - uncalibrated**
    - **Graph - calibrated** (with new Span & Trim settings)
    - **Apply** - allows the new settings to be applied to the associated product

13. Press the **Graph - uncalibrated** button  to view the data all normalised to Span = 1, Trim = 0 (Figure 7-15).

    The best-fit line through the data shows the type of calibration fit required. If the line is parallel to the perfect calibration line, then this represents a 'Trim Only' calibration. If the best-fit line shows a slope change to the perfect calibration line, this represents a full 'Span & Trim' calibration.

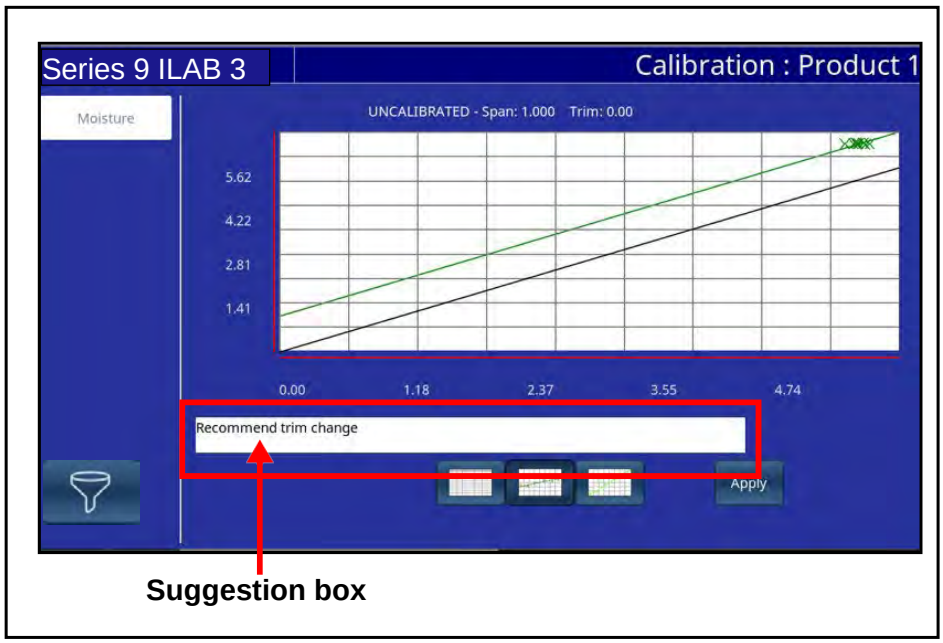


Figure 7-15 Uncalibrated Graph with Span = 1, Trim = 0

The **Suggestion** box notifies what type of calibration change is required. It will also show instructions if insufficient data is available.

Press the **Graph - calibrated** button  to view the data with the new calibration settings applied (Figure 7-16).

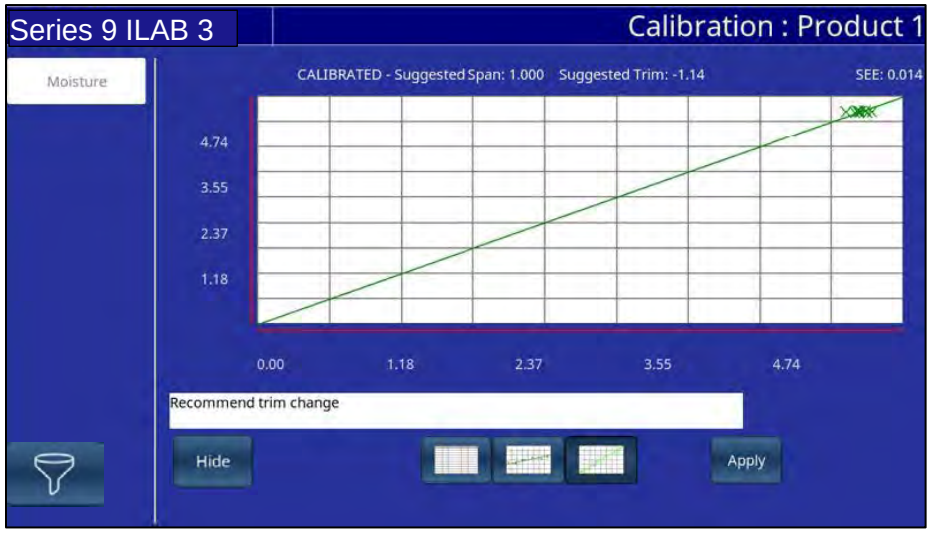


Figure 7-16 Calibrated Graph

14. When satisfied with the suggested calibration settings, press **Apply** and then press **Ok** (Figure 7-17). This will download the new calibration settings to the selected product. If this is the active product, the new settings will also be downloaded into the analyser.

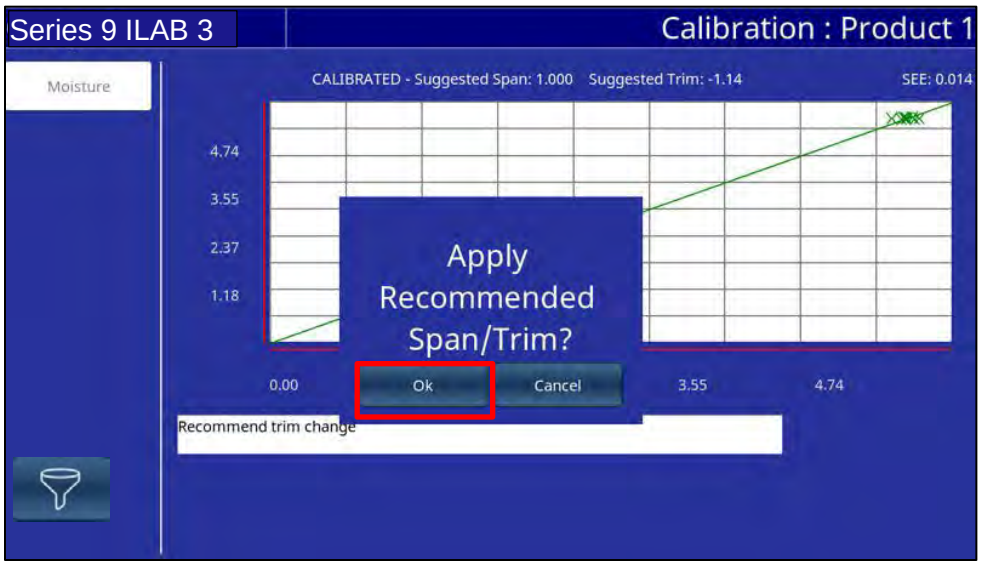


Figure 7-17 Press Ok to apply new calibration settings

15. If there are any statistical outlier data points, these will be highlighted in two ways:

    - **Table view** – the associated **Adjusted** cell will be filled in orange (Figure 7-18)

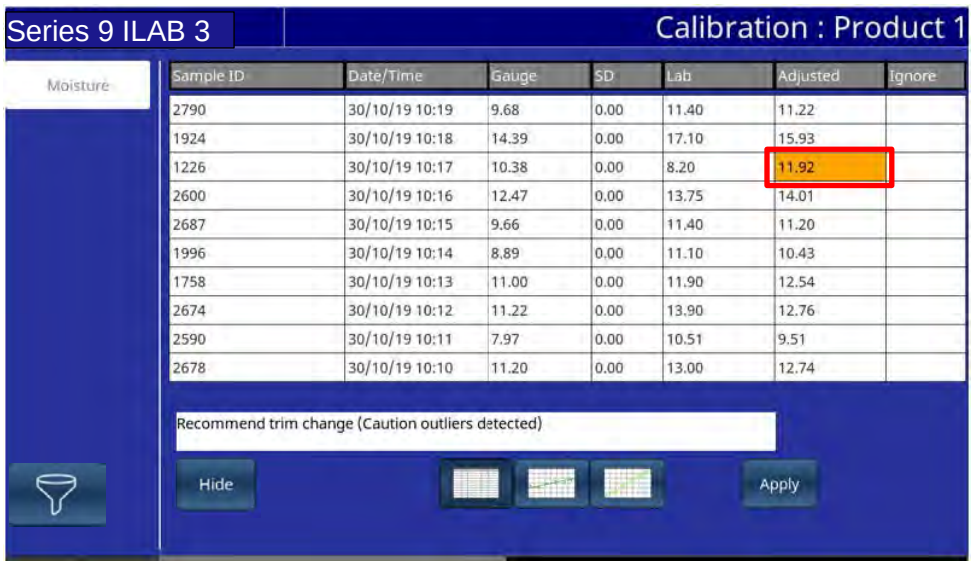


Figure 7-18 Outlier cell is filled in orange

- **Graph view** – the data point will be shown in red (Figure 7-19)

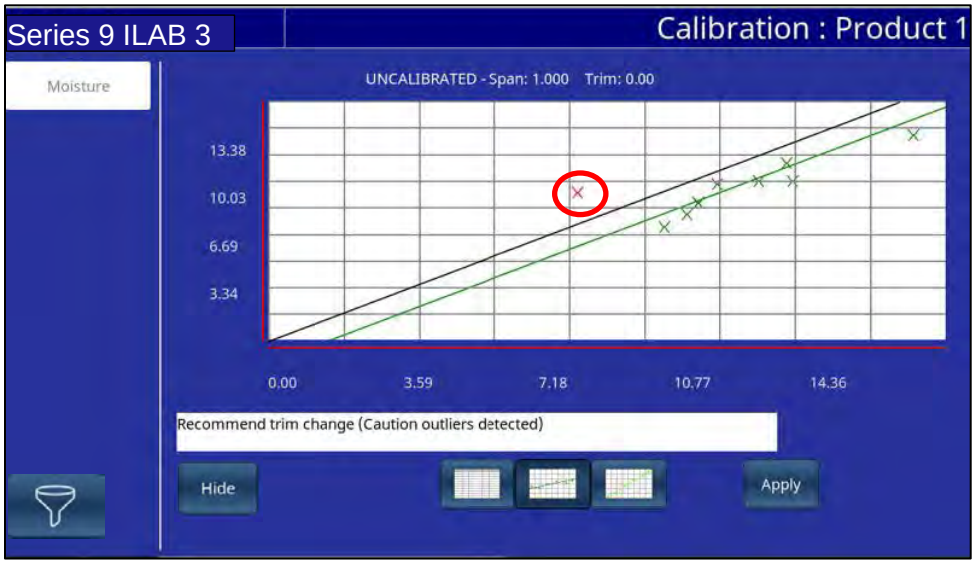


Figure 7-19 Outlier data point is shown in red

The **Suggestion** box will also indicate that an outlier is present in the given suggested calibration change comment.

- The outlier data point will be included in the calibration calculation unless the associated **Ignore** cell is crossed (Figure 7-20).

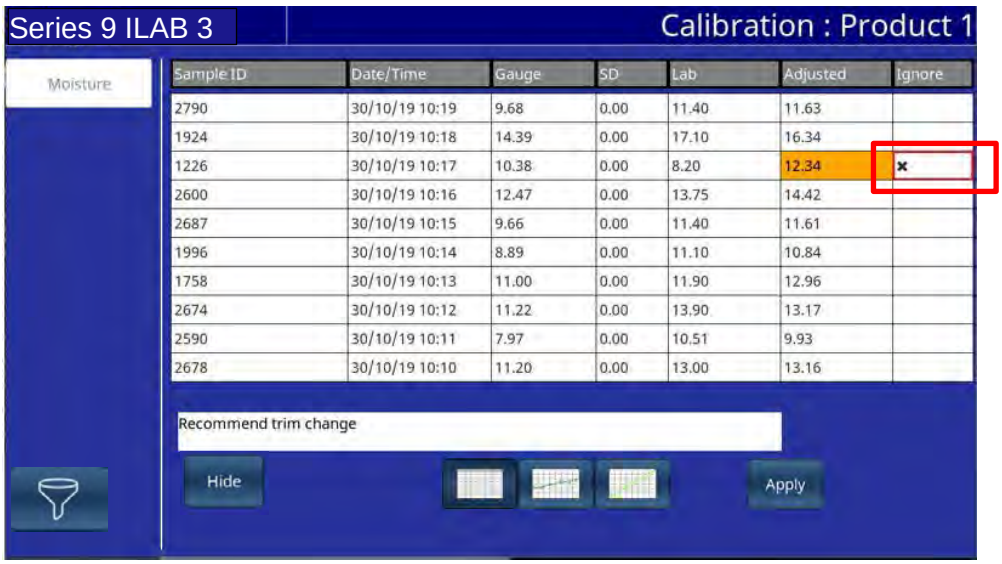


Figure 7-20 Ignore cell is crossed

With the outlier ignored, the **Suggestion** box returns to a standard calibration change recommendation.

7.2.2.2 Calculating and Applying Trim

This procedure saves a Trim adjustment in a product, based on values obtained using the Sample function.

1. Obtain the appropriate sample data as described above.
2. Touch the  **Configuration** button, then touch 

Configure Products to bring up the Configure Products page (Figure 7-21).

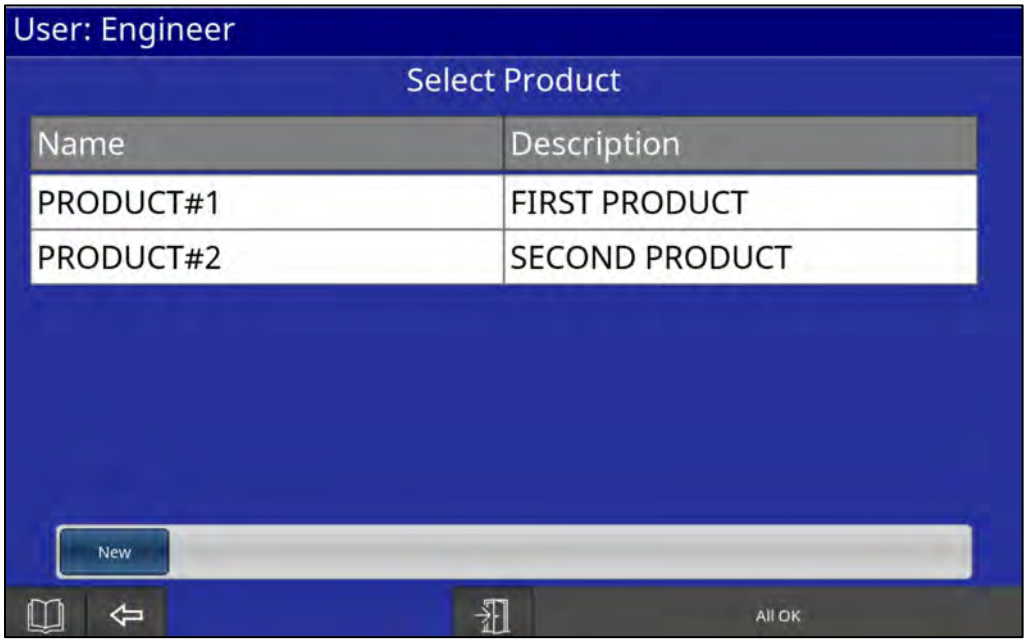


Figure 7-21 Configure Products page

3. Select the product from the table, then touch the **Edit** button to edit the product (Figure 7-22).

Figure 7-22 Enter new Trim value in product

4. Calculate the new Trim value:

   $$T_1 = T_0 + (Lab_M - G_M)$$

   where:

   T_1 = New Trim value

   T_0 = Current Trim value

   Lab_M = Average of laboratory reference values

   G_M = Average of gauge sample measurements

5. Enter the new Trim value in the **Trim** box.

6. Touch the **Save Changes** button to save the Trim value in the product. (If the **Cancel Changes** button is touched, this will cause that value to be discarded.)

7.2.3 Internal Referencing the Analyser

7.2.3.1 Performing an Internal Reference

1. Touch the  **Configuration** button, and then touch 

Gauge Diagnostics on the Settings page.

2. Touch the  **Check** button to bring up the Gauge/Reference Check page (Figure 7-23).

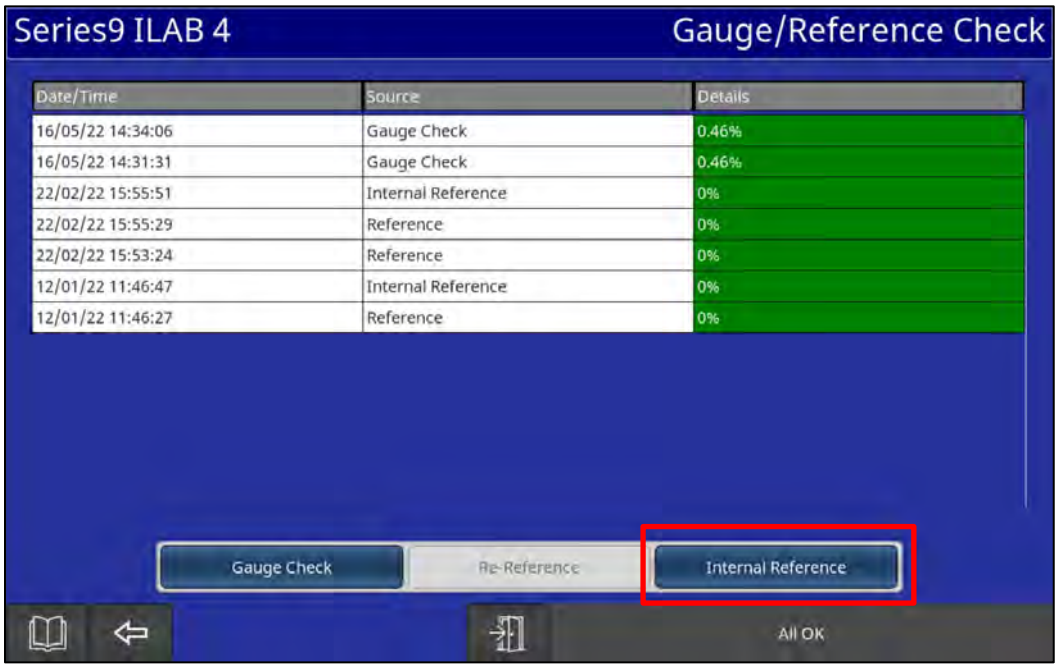


Figure 7-23 Gauge/Reference Check page

3. Touch the **Internal Reference** button to start the process.

   A 10-second countdown is displayed while the sampling is in progress, followed by a success or fail message.

7.2.3.2 Using the External Auto Reference Standard (ARS)

The external Auto Reference Standard (ARS) can be used to check the stability of the InfraLab TL by presenting a diffuse reflectance target. It is also used to retrain the internal reference standard in the event of a failure of the on-board computer and losing the factory settings.

Refer to Section 4.6.5 - Using the Reference Standard.

Attach the ARS to the analyser as follows:

1. Touch the  **Configuration** button, and then touch 

Gauge Diagnostics on the Settings page.

2. Touch the  **Check** button to bring up the Gauge/Reference Check page (Figure 7-23).

3. Touch the **Re-Reference** button to start the process.

   A 10-second countdown is displayed while the sampling is in progress, followed by a success or fail message. When finished, the system waits for the user to remove the external ARS, and then it teaches the internal ARS to match the results from the external ARS.

7.2.3.3 Re-Reference Failed

If a fail message is displayed, it indicates that the correction required is beyond the capability of the normal Re-Reference process.

Note: The number in the message has no operational significance, but may be required by Nordson to assist with diagnosis of the unit. Please make a note of the number.

Possible causes are:

- **Gauge window contaminated, or ARS window contaminated externally.**

  In this case, clean the window(s) and repeat the Re-Reference procedure.

- **ARS not fitted correctly, or not allowed to equalise to the ambient temperature.**

  Check, and then repeat the Re-Reference procedure.

- **ARS contaminated.**

  This can happen as a result of poor storage conditions. Clean the ARS and try again, and if it persists, return the ARS to Nordson.

- **InfraLab TL analyser faulty.**

  If the error is not caused by contamination as described, it is possible that the analyser is faulty. In this case, contact Nordson.

7.2.4 Performing Full-Range Calibration

In most circumstances, adjustment of Trim (see Section 7.2.2 - Trim) is sufficient to provide accurate measurements around a target value.

Where the application requires measurement across a range of values, however, it may be necessary to perform a full-range calibration involving the determination of optimum values for both Trim and Span.

This is not generally recommended for routine calibration because it is time consuming and requires product to be made with a wide variation in the levels of the measurement parameters.

Note: The easiest way to do a full-range calibration is to use the Calibration Tool (see Section 7.2.2.1 - Obtaining Samples and Calibration).

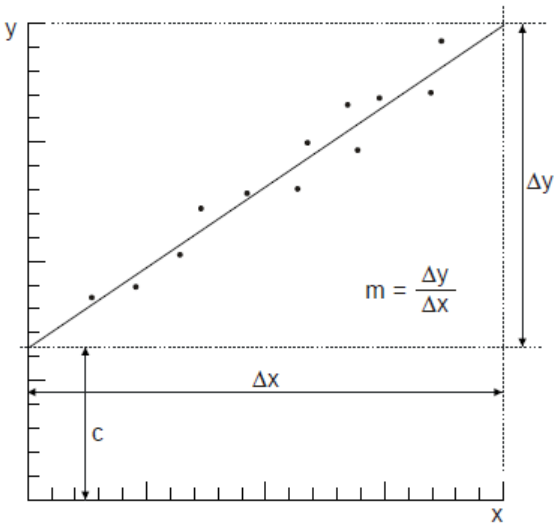
The general method described here can be used as an alternative.

1. To provide a starting point for the full-range calibration, set the gauge Trim using the Auto-Trim procedure (see Section 7.2.1 - Using Auto-Trim).

2. Obtain analyser and laboratory sample data over the required measurement range using the Sample function (see Section 7.2.2.1 - Obtaining Samples and Calibration).

   The accuracy of the predicted Span value depends on the measurement range over which data is collected, and the number of samples taken. As a guide, the range should cover at least 70% to 130% of the target value, with a minimum of ten samples.

3. Perform a linear regression (least squares or orthogonal) using the laboratory reference value as the independent variable (x) and the analyser output as the dependent variable (y).



The equation of the best-fit line is given by:

$$y = mx + c$$

where

m is the slope of the best-fit line

c is the y intercept of the best-fit line

4. Calculate the new Span value S_1 from:

$$S_1 = S_0 / m$$

where S_0 is the original Span (as used during data collection).

5. Calculate the new Trim, T_1 from:

$$T_1 = (T_0 - c) / m$$

where T_0 is the original Trim value (as used during data collection).

6. Enter the calculated values of **Trim** and **Span**, using the Edit Product function (see Section 6.6.2 - Editing an Existing Product).

7.2.5 Checking Analyser Stability

InfraLab TL analysers are self-compensating for factors such as aging of their internal source lamp, and are substantially unaffected by ambient light or environmental temperature changes within their operating temperature range. Consequently, the InfraLab TL should be stable and provide consistent measurements over long periods of operation.

If you wish to check this for any reason, it can be done using either of the methods described below.

Checking the Analyser Output with the External ARS

To do this, you will need a product (see Section 6.4 - About Products) with a **Span** value of 1.00 and a **Trim** value of 0.00.

1. If necessary, create a new product (see Section 6.6.1 - Creating a New Product) with a Span value of 1.00 and a Trim value of 0.00, and save it with a meaningful name such as Stability Check.

2. Load the product to the analyser to be tested.

3. Fit the external ARS to the analyser (see Section 7.2.3.2 - Using the External Auto Reference Standard (ARS)).

4. Check the analyser outputs on the Home page by taking a manual sample and record for future reference.

5. Remove the external ARS and load the normal operating product.

6. Repeat this procedure at intervals and check that the analyser output remains consistent over time.

Using the Gauge Check Function

Note: This function is accessible only to a Supervisor or Engineer.

This function can be used without loading a special product. It checks the analyser output against the internal reference standard and provides a date- and time-stamped percentage reading, which represents the deviation from ideal.

It is important to understand that this is a very sensitive check, and that some deviation from 0% is normal. As an indication, a reading of 5% is equivalent to the threshold for failure of the internal reference procedure (see Section 7.2.3 - Internal Referencing the Analyser). Anything below 3% is insignificant for all practical purposes.

1. Touch the  **Configuration** button, and then touch 

Gauge Diagnostics on the Settings page.

2. Touch the  **Check** button to bring up the Gauge/Reference Check page (Figure 7-23).

3. Touch the **Gauge Check** button to start the check.

   The screen will show a 10-second countdown and then display a table showing the result of the gauge check (and references), together with previous results (Figure 7-24).

   The **Details** column provides an indication of how good the check or reference was with a traffic light system (green, yellow, red) to give a quick indication of good (<3%), marginal (3 to 5%), or bad results (>5%).

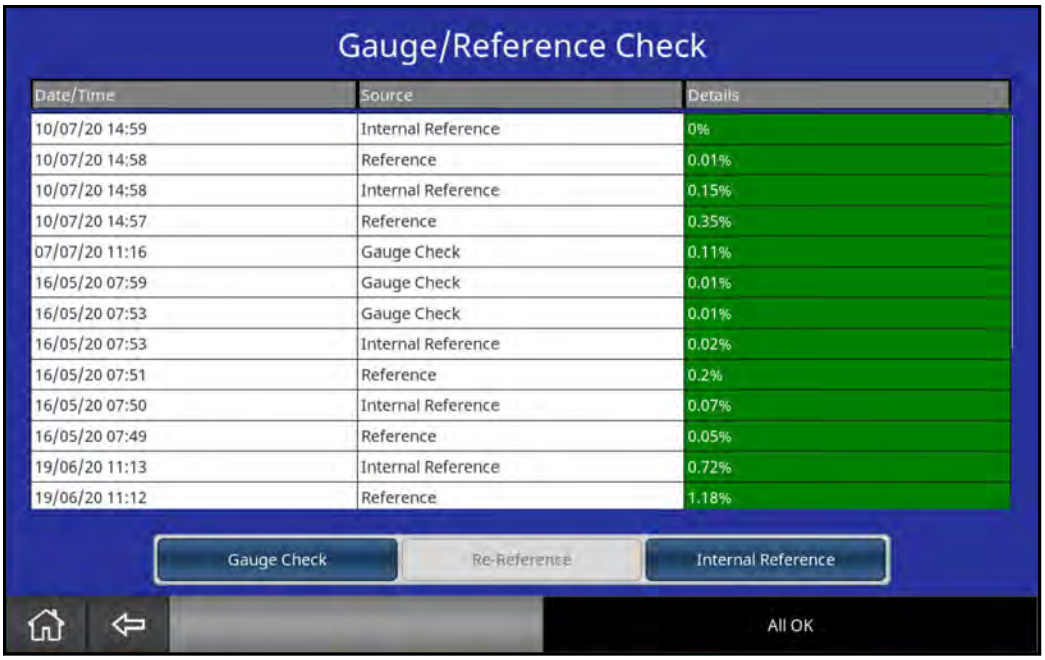


Figure 7-24 Gauge/Reference Check results

CHAPTER

8

8 Maintenance

This chapter covers general cleaning of InfraLab TL components, and corrective maintenance to the level of the parts designated as customer replaceable items.

8.1 Warnings and Cautions

When carrying out any maintenance on the system, observe the following to avoid injury to personnel and damage to the equipment.

BATTERY WARNING

There is a rechargeable PCB-mounted battery in the Series 9 sensor – **NO attempt should be made by the user to replace it.** If there are issues regarding this, please consult Nordson or their representative.

- Do not power up the InfraLab TL when the case is open. The filter wheel rotates at a very high speed and could cause injury and contains mains potential voltages.
- InfraLab TL maintenance must be carried out in a clean area away from airborne contaminants.
- While the InfraLab TL case is open, take care not to touch any optical surfaces.
- When working on any system components, observe standard anti-static precautions.

8.2 Moving the Unit

Note: Always remove the sampling cassette before moving the unit as this could easily be dislodged.

The unit weighs 14 Kg and can be moved into position by holding it at its base with two hands either side and then placing onto a bench top at waist height.

If necessary, employ a second person to help with the lift if it is too heavy for you.

8.3 Cleaning

External surfaces of the InfraLab TL should be cleaned periodically with a damp non-abrasive cloth only.

Keep cables and connectors free from contaminants that could cause chemical damage. Clean the gauge window as described below.

Caution: If solvents are needed to remove contamination, it is essential to consult the Customer Care Department of Nordson or their agent first, giving precise details of the solvent.

8.3.1 Cleaning the InfraLab TL Windows

The InfraLab TL monitors the contamination of the viewing window and will give a warning if the levels are excessive. However, it is important to check the windows after each use and if necessary, clean them. This can be done simply by removing the sampling cassette to expose the three windows and wiping them clean with a non-abrasive cloth or brush.

Where necessary, use warm water and a mild detergent. **Do not use abrasive cleaners of any kind.**

Ensure that the window is dry before making any further measurements.

If a solvent is needed to remove contaminants, contact Nordson or their agents first.

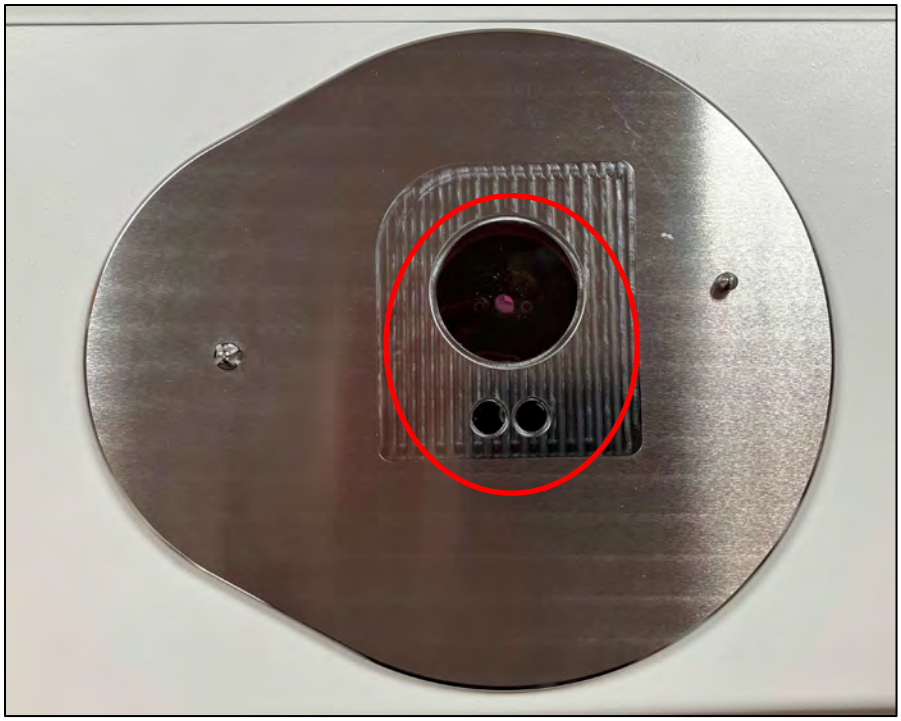


Figure 8-1 Windows

8.3.2 Routine Cleaning the Rotating Sampling Cassette

It is important to keep the sampling unit clean and it is highly recommended to clean the sampling cassette after each use, especially if there has been some spillage. This can easily be done using a brush or compressed air and if necessary, a damp cloth to remove any sticky sample deposits.

Note: Always brush or blow the spillage material away from the rotating mechanism to avoid any ingress of the sample material into the cassette itself.

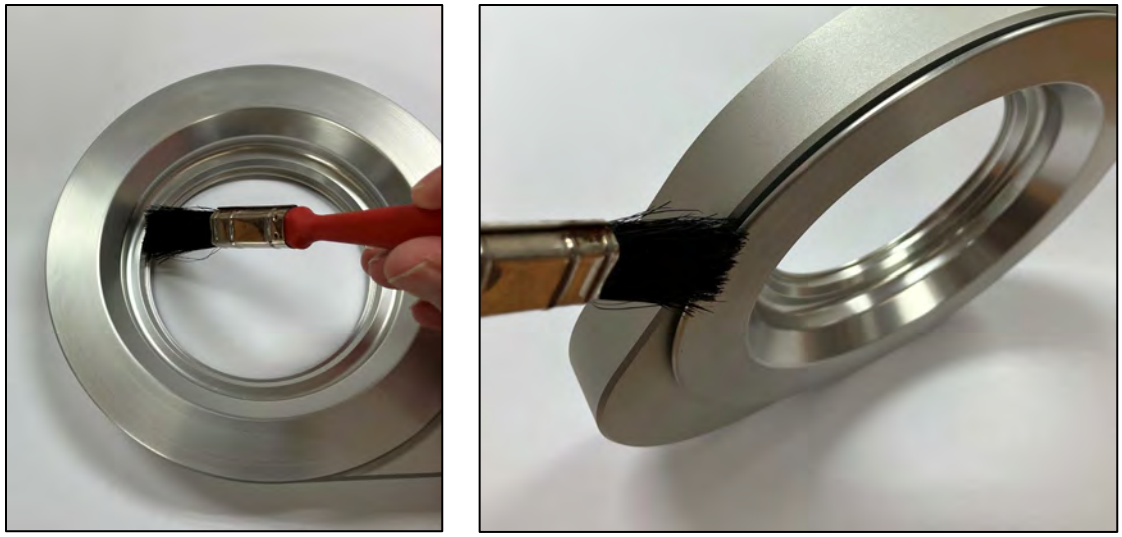


Figure 8-2 Use a brush for cleaning

8.3.3 Cleaning the Internals of Rotating Sampling Cassette

It is recommended that the cassette is checked regularly for any build-up of sample material within the cassette itself as this could cause the mechanism to jam.

This can be done by placing the cassette on its face and removing the rear plate by unscrewing the 8 screws using a posidrive screwdriver.

Figure 8-3 Remove the cassette rear plate

If any build-up of sample material is found, brush or blow out the material with compressed air and if necessary, use a damp cloth to remove any sticky sample deposits.

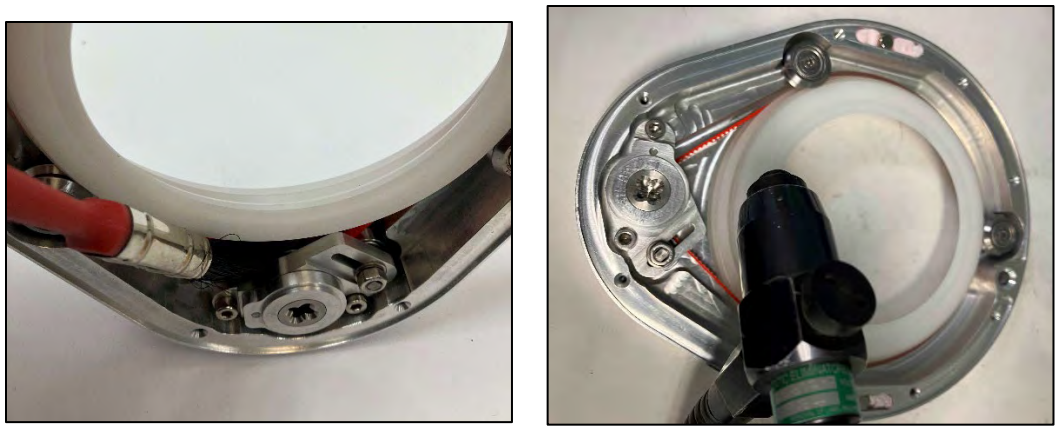


Figure 8-4 Brush or blow out build-up

8.4 Checking and Adjusting the Belt Tension in the Rotating Sampling Cassette

1. Follow the procedure in Section 8.3.3 - Cleaning the Internals of Rotating Sampling Cassette to remove the cover of the rotating sampling cassette to expose the drive belt.

2. Apply a small amount of pressure, shown here with an Allen key, to ensure that the belt is in tension and not too loose that it will slip.

Figure 8-5 Apply pressure with Allen key

3. If necessary, the tension can be adjusted by loosening the nut shown below with an 8 mm spanner, then moving the tensioning bearing by sliding it up and down with your finger to get a small amount of tension in the belt, and then tightening the nut. It only needs enough tension to stop it from slipping, which can be checked by rotating the sample holder ring while holding back the belt with your fingers.

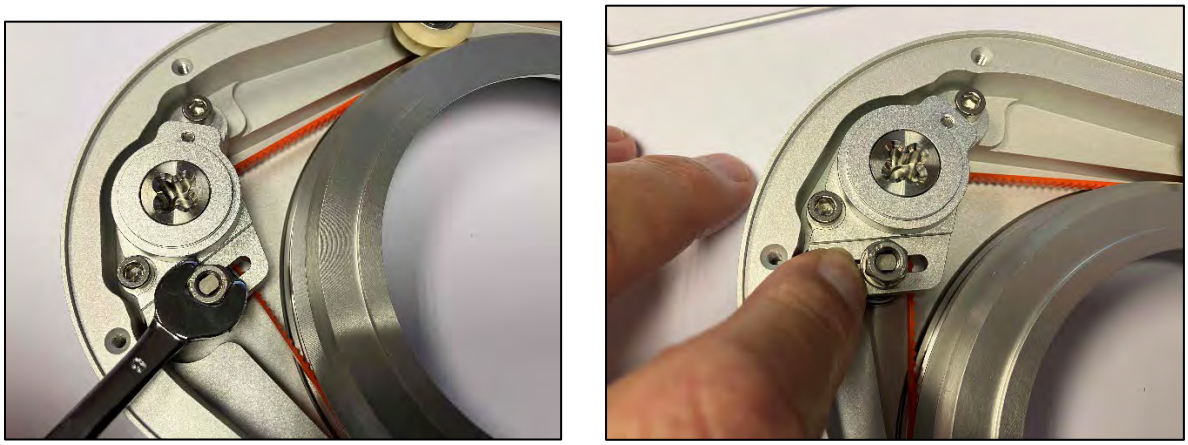


Figure 8-6 Loosen nut and move tensioning bearing

4. Refit the cover of the rotating sampling cassette.

8.5 Replacing the Mains Fuse

To replace the mains fuse:

1. Using a flat-bladed screwdriver, unscrew the fuse holder anti-clockwise and remove.

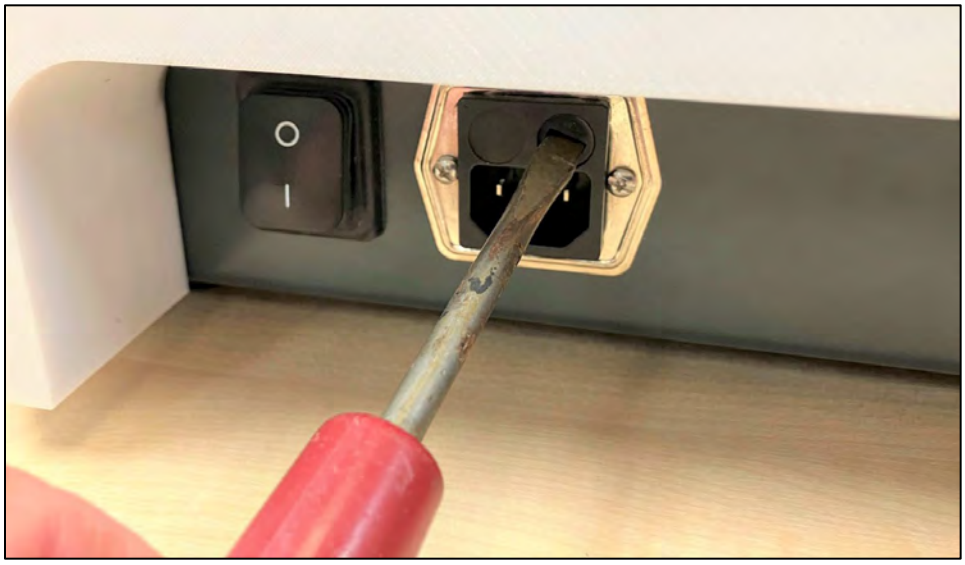


Figure 8-7 Use screwdriver to unscrew fuse holder

2. Pull out the fuse and replace with a 20mm 4A 250v.

Figure 8-8 Pull out and replace fuse

3. Refit the assembly in the reverse sequence.

8.6 Replacing the Gauge Source Lamp Assembly

To replace the Gauge Source Lamp Assembly:

1. Disconnect the power cable and remove the rear panel by first unscrewing the 4 x M6 captive bolts with a 5mm Allen key.

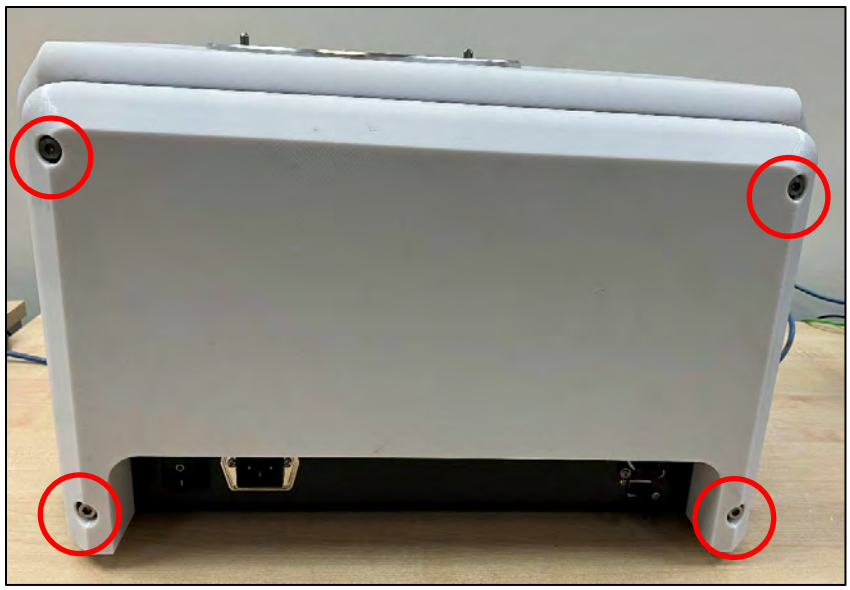


Figure 8-9 Unscrew 4 x M6 bolts

2. This will reveal the gauge chassis, as shown in the photo below.

Figure 8-10 Gauge chassis

3. Remove the bracing bracket by removing the 2 x M3 screws at the top and 3 x M4 screws at the bottom.

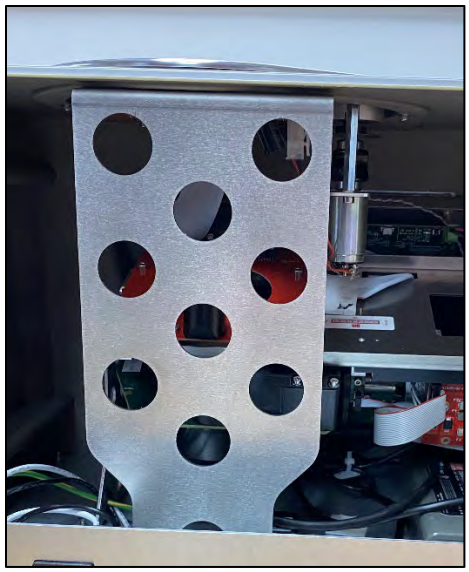


Figure 8-11 Remove bracing bracket

4. Next, remove the ribbon cable connection from the tray drive board by firmly holding the connector at its sides and pulling downwards.

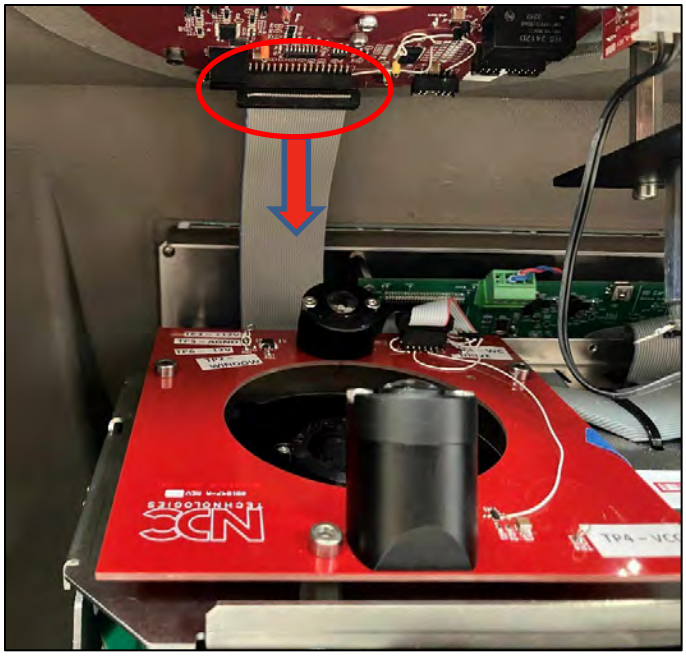


Figure 8-12 Pull ribbon cable connector downwards

5. Unplug the three connectors from the transition PCB by pulling on the connectors.

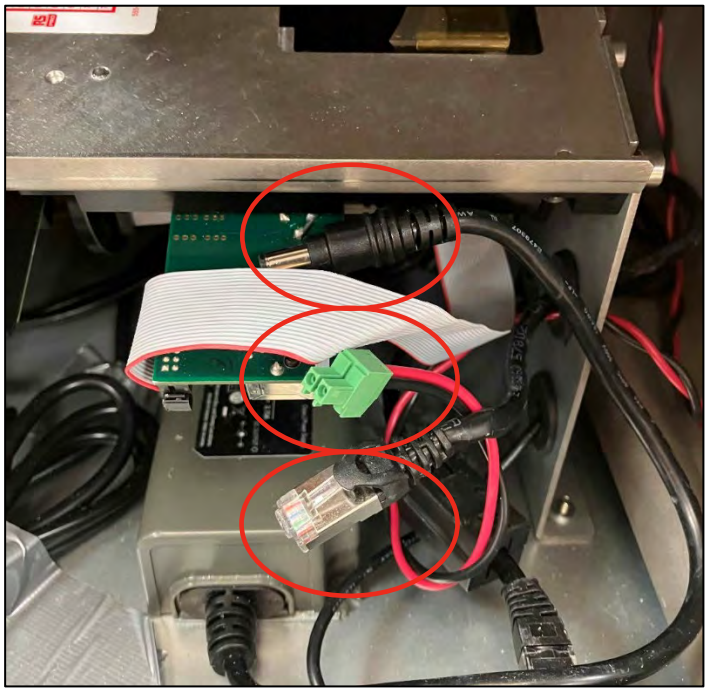


Figure 8-13 Unplug three connectors from transition PCB

6. Loosen the fixing screws on the left and right sides of the gauge chassis with a suitable Allen key. (If necessary, remove the transit bracket if fitted on the right side.)

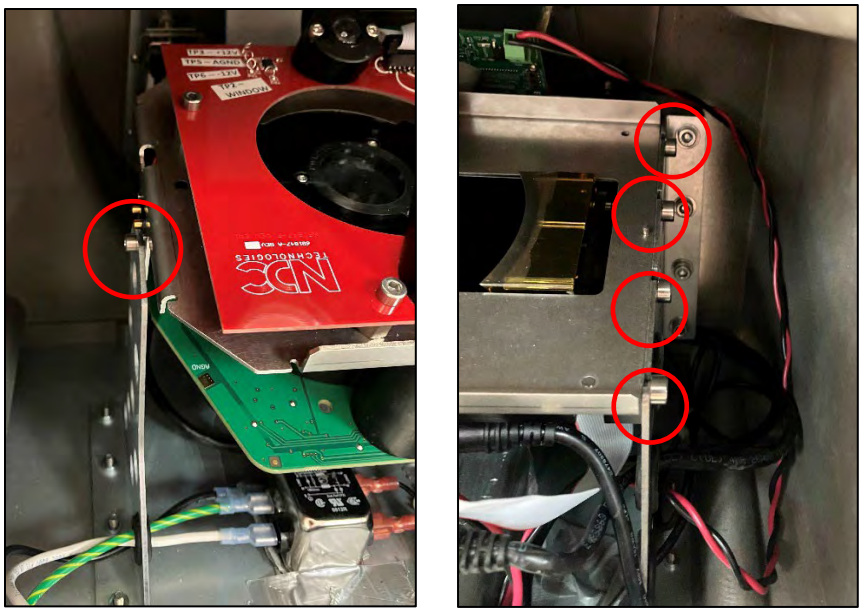


Figure 8-14 Remove fixing screws on sides of gauge chassis

7. Next, carefully lift the gauge chassis off its fixings and withdraw it from the unit while rotating it on its axis to reveal the USB connections that need to be unplugged.

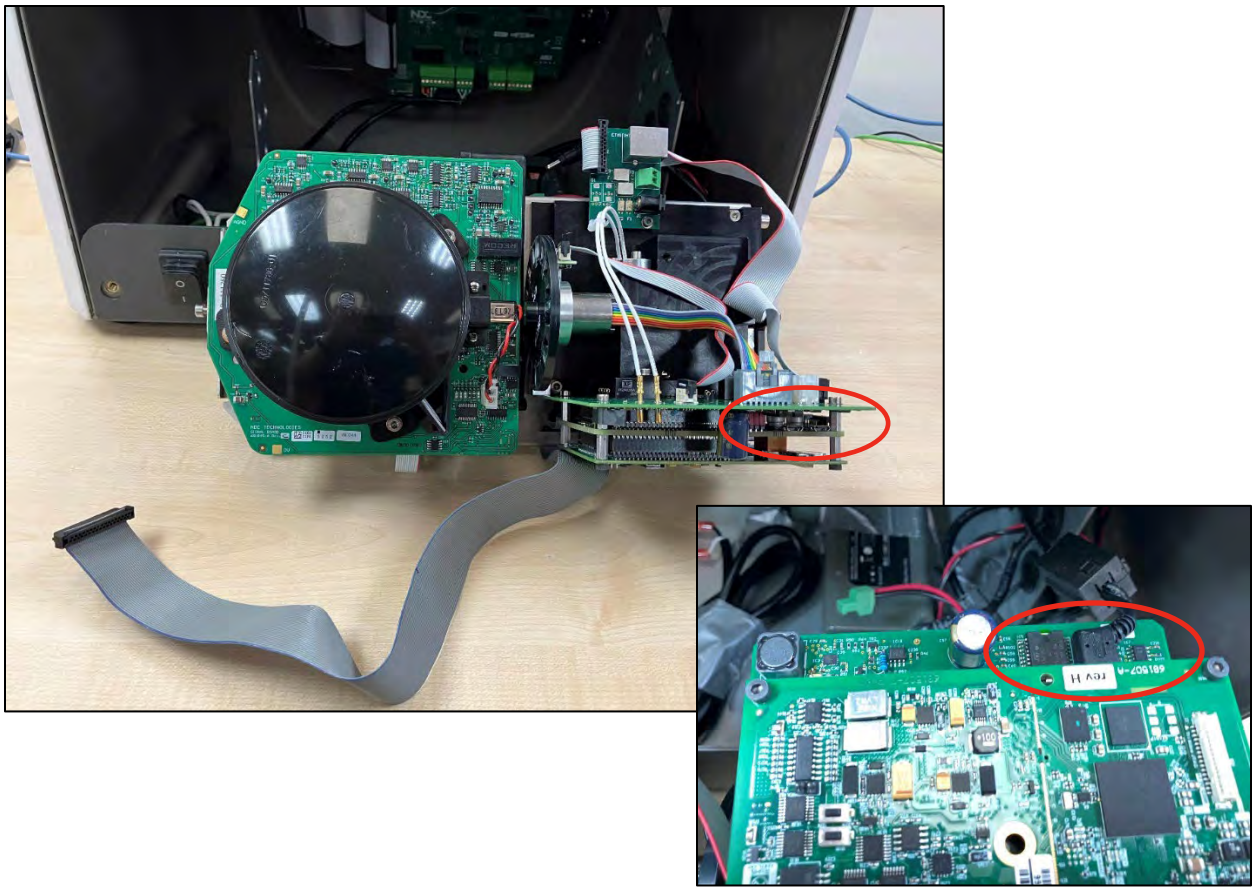


Figure 8-15 Note USB connections that need to be unplugged

8. Note the location of the lamp and motor assembly that can now be accessed for replacement as needed.

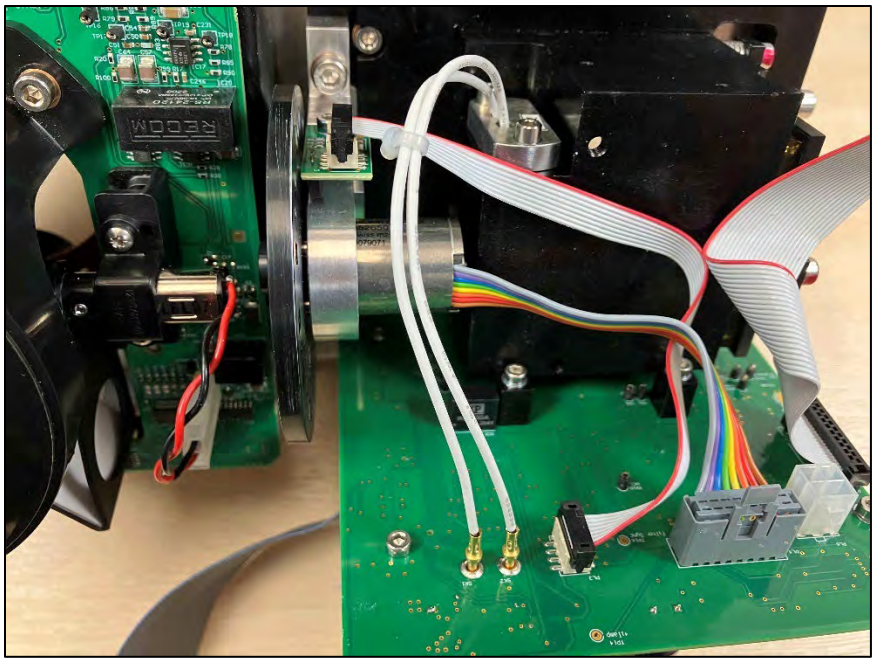
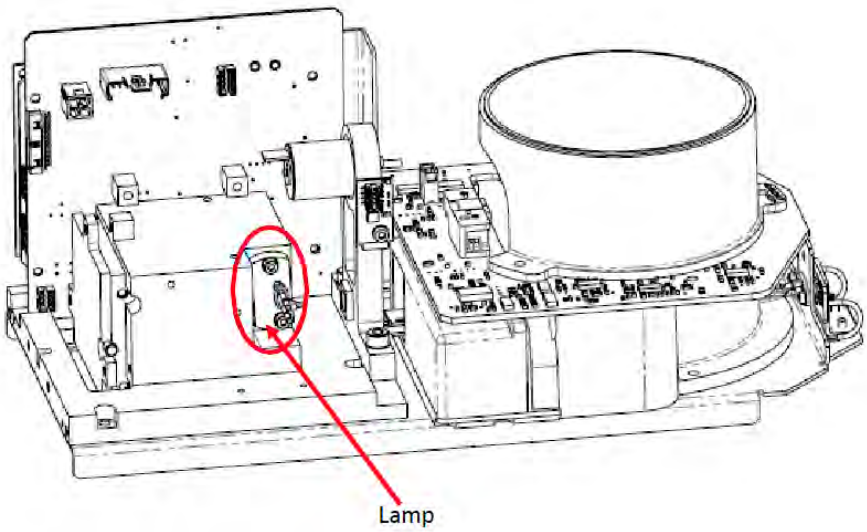


Figure 8-16 Note location of lamp and motor assembly

9. Locate the lamp, as indicated in the figure below.



10. Unplug the two lamp assembly leads.

11. Undo the two lamp fixing screws with a 2.5mm Allen key, and withdraw the lamp assembly from its mounting.

12. Fit the new lamp and reassemble the sensor, following the reverse of this procedure.
    Take care not to touch the lamp glass as this may cause premature lamp failure.

    If accidental contact is made, clean the lamp glass with isopropyl alcohol (IPA).

13. Refit the chassis in reverse order as follows:

    a. Rotate the gauge chassis on its axis and fit the USB connectors.

    b. Place the gauge chassis on the support brackets and tighten up the 5 fixing screws.

    c. Fit the 3 connectors to the transition PCB.

    d. Refit the ribbon cable connector on the tray drive board, ensuring that the ribbon cable is routed away from the optical path of the gauge.

    e. Refit the enclosure rear panel and tighten the 4 x M6 screws with a 5mm Allen key to a torque of 2Nm.

    After re-assembly, check the unit's functionality to ensure that all the interconnections have been made correctly. This can be done by taking a few samples and ensuring that no error messages are shown on the screen, and checking that both USB ports work by fitting a memory stick and checking that they are recognized in the USB configuration screens.

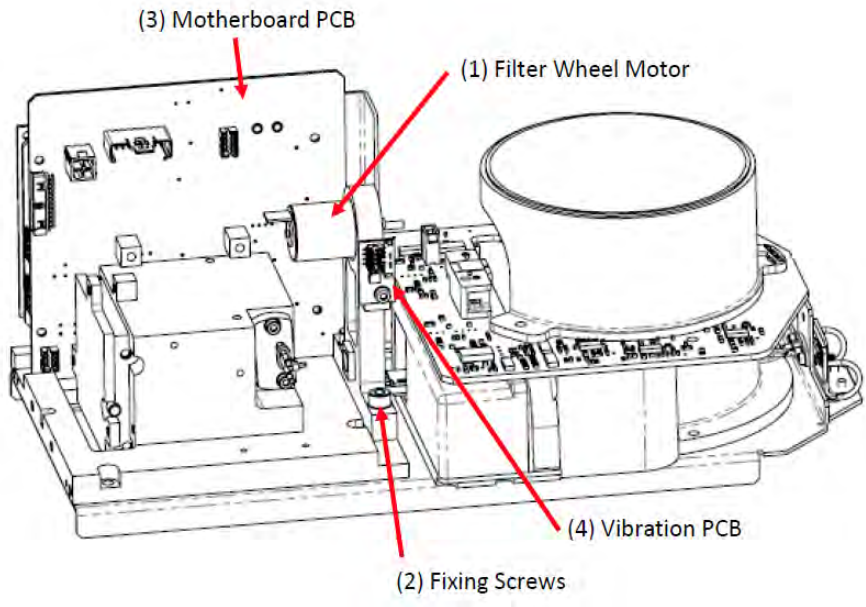
14. Allow 2 hours for the unit to reach full operating temperature, then re-reference the gauge as described in Section 7.2.3.1 - Performing an Internal Reference.

8.7 Replacing the Filter Wheel Motor

To replace the filter wheel motor:

1. Follow the procedure in Section 8.6 - Replacing the Gauge Source Lamp Assembly to remove the chassis.

2. Locate the filter wheel motor (1), as indicated in the figure below.



3. Unplug the filter wheel motor ribbon cable connector from the motherboard PCB (3).

4. Unplug the vibration PCB (4) ribbon cable connector.

5. Undo the filter wheel motor assembly fixings screws (2) with a 4 mm Allen key.

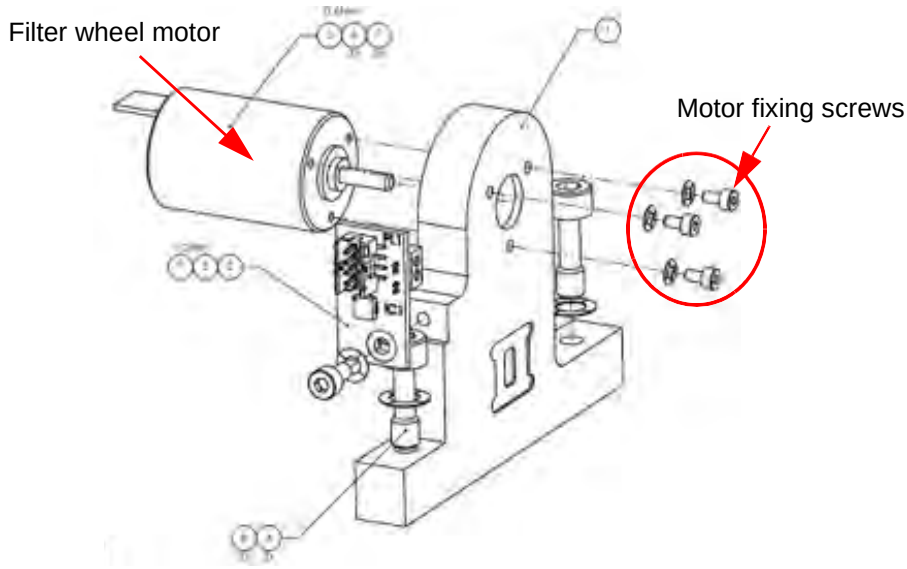
   Lift the filter wheel assembly away from the chassis. Do not touch the optical surfaces of the filter wheel. If accidental contact is made, clean the optical surfaces with isopropyl alcohol (IPA).

6. Note the orientation of the filter wheel, with the bush containing the grub screw towards the end of the motor shaft.

7. Loosen the grub screw and carefully withdraw the filter wheel from the motor shaft.

   If the filter wheel does not come off easily, do not attempt to pull it off, as this may damage the motor bearings. Instead, grip the wheel by its edges and use a small Allen key or similar tool to push the motor spindle out from the wheel.

8. Remove the 3 x motor fixing screws using a 1.5 mm Allen key, as shown in the figure below.



9. If the instrument is within the warranty period, return the faulty motor to Nordson for replacement. If not, discard the motor.

10. Fit the filter wheel to the new motor.

    If the wheel is a tight fit, do not attempt to push it on while holding the motor. Place the back end of the motor shaft against a hard surface and then push the filter wheel on as far as it will go.

11. Tighten the filter wheel grub screw.

12. Refit the motor assembly, following the reverse of the previous steps.

13. Refit the chassis, following the procedure in Section 8.6 - Replacing the Gauge Source Lamp Assembly.

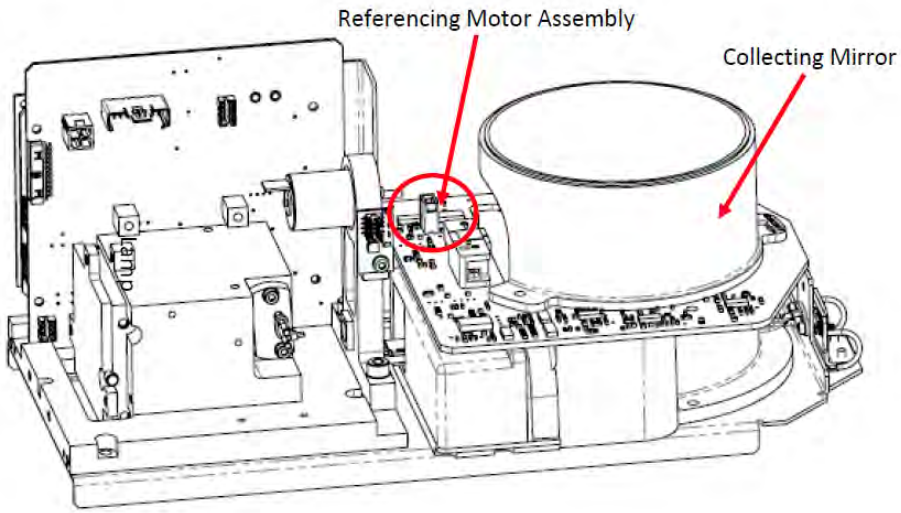
14. Allow 2 hours for the unit to reach full operating temperature, then re-reference the gauge as described in Section 7.2.3.1 - Performing an Internal Reference.

8.8 Replacing the Referencing Motor

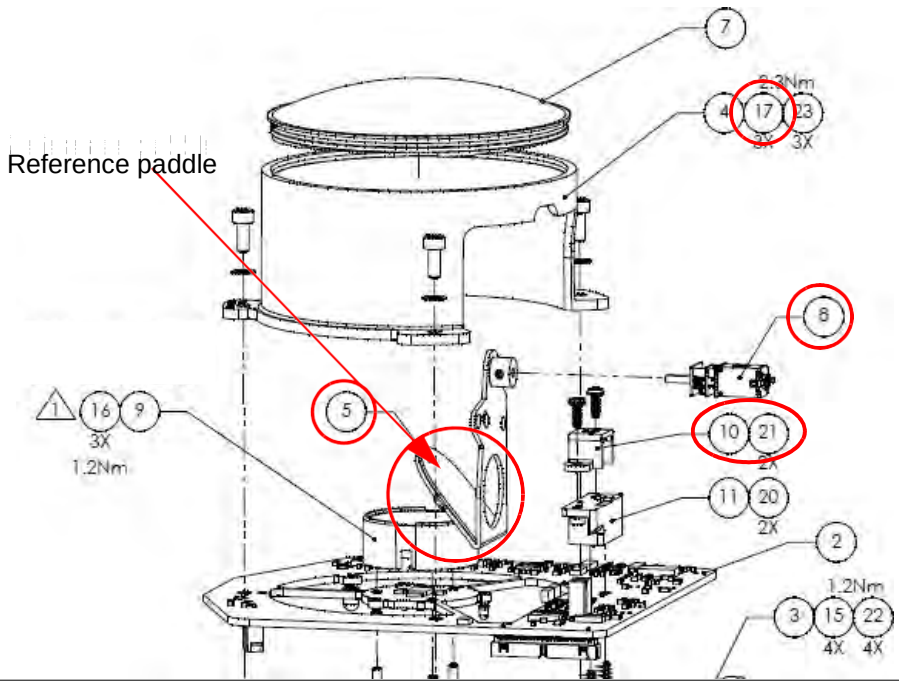
To replace the referencing motor:

1. Follow the procedure in Section 8.6 - Replacing the Gauge Source Lamp Assembly to remove the chassis.

2. Locate the referencing motor, as indicated in the figure below.



3. Remove the collecting mirror by removing the 3 x M4 screws (item 17 below) with a 3 mm Allen key, then carefully lift and store it away.



4. Carefully unplug the motor lead, remove the two pozi drive screws securing the reference motor clamp (8,10, 21) and lift away the motor and reference paddle (5).

5. Remove the reference paddle from the motor shaft by undoing the grub screw and sliding it off the shaft.

6. Fit the reference paddle to the new motor by sliding along the motor shaft until it bottoms out, then tighten the grub screw.

7. Reassemble the parts, following the reverse of the previous steps.

8. Refit the chassis, following the procedure in Section 8.6 - Replacing the Gauge Source Lamp Assembly.

9. Allow 2 hours for the unit to reach full operating temperature, then re-reference the gauge on the external ARS as described in Section 7.2.3.2 - Using the External Auto Reference Standard (ARS).

CHAPTER 9

9 Troubleshooting

9.1 System Error Messages

InfraLab TL analysers have built-in diagnostics to monitor certain key operating parameters and to provide appropriate error messages on the control panel). The following table provides brief explanations of the messages together with the recommended action. Some of the diagnostic parameters listed in the table are shown on the InfraLab TL Diagnostics screen (see Section 6.3.1 - Viewing Diagnostic Information) - if this is the case, those parameters are marked “Yes” in the “Shown on Gauge Diag. screen” column of the table.

Note: There may be more than one error condition at a time. The errors are priority-rated, and the highest priority one is displayed in the Gauge Status box, on the bottom right corner of the screen (see Section 5.1.3 - Responding to Error Messages).

In the event of an error message, check the listed possible causes and take the appropriate remedial actions. If these do not clear the error, please contact Nordson for advice.

	Diagnostic Parameter			
Error message	**Diag. parameter and units**	**Shown on Gauge Diag. screen**	**Fault State**	**Recommended Action**
Lamp voltage low error	Lamp voltage (V)	Yes	V_L < 0.95 X nominal (4.8V or 4V)	If lamp current is also low, lamp power supply failure: **change mother PCB.** If lamp current is high, lamp failure: **change lamp.** (see Section 8.6 - Replacing the Gauge Source Lamp Assembly)
Lamp voltage high error	Lamp voltage (V)	Yes	V_L > 1.05 X nominal (4.8V or 4V)	Lamp power supply failure: **change motherboard PCB.**

Diagnostic Parameter				
Error message	**Diag. parameter and units**	**Shown on Gauge Diag. screen**	**Fault State**	**Recommended Action**
Lamp current low error	Lamp current low error	Yes	I_L < 0.9 X nominal (2.9A or 2.7A)	If lamp voltage is also low, lamp power supply failure: **change mother PCB.** If lamp voltage is normal, lamp failure: **change lamp.** (see Section 8.6 - Replacing the Gauge Source Lamp Assembly)
Lamp current high error	Lamp current (A)	Yes	I_L > 1.1 X nominal (2.9A or 2.7A)	If lamp voltage is also high, lamp power supply failure: **change mother PCB, also lamp.** If lamp voltage is not high, lamp failure: **change lamp.** (see Section 8.6 - Replacing the Gauge Source Lamp Assembly)
Lamp hours exceeded	Lamp running time (days/hours)	Yes	lamp run hours > 43800	Warning, lamp requires replacement: **change lamp** (see 8.6 - Replacing the Gauge Source Lamp Assembly)
Filter Wheel motor hours exceeded	Filter Wheel motor running hours (days/ hours)	Yes	motor run hours > 43800	Warning, filter motor requires replacement: **change motor** (see Section 8.7 - Replacing the Filter Wheel Motor)
Filter Wheel motor failure	Filter Wheel motor speed (rpm)	Yes	Software unable to control motor speed to target to within 10rpm	Motor control failure. Try resetting analyser, if fault persists: **change motor.** (see Section 8.7 - Replacing the Filter Wheel Motor)

Diagnostic Parameter				
Error message	**Diag. parameter and units**	**Shown on Gauge Diag. screen**	**Fault State**	**Recommended Action**
Motor Error	N/A	Yes	The target motor speed cannot be achieved or maintained. The motor drive is turned off in this condition.	Faulty motor: **replace or check with Nordson** (see Section 8.7 - Replacing the Filter Wheel Motor)
Tray drive error	N/A	Yes	Indicates a fault in the sample turntable drive mechanism	Check with Nordson
Excessive vibration	Filter Wheel motor vibration	Yes	Excessive vibration detected at motor mount >100	Warning, vibration detected: **change motor** (see Section 8.7 - Replacing the Filter Wheel Motor)
Window contaminated	Window contamination level (calibrated units 0.0 to 1.0)	Yes	WC value > 0.5: Warning WC value > 1: Fault	WC value > 0.5: **window needs cleaning** WC value > 1: **window cleaning fault** (see Section 8.3.1 - Cleaning the InfraLab TL Windows)
Gauge temperature is too low	Internal Temperature (°C)	Yes	<0°C	Check ambient temperature (0 to 50°C)
Gauge temperature is too high	Internal Temperature (°C)	Yes	>70°C	Check ambient temperature (0 to 50°C)

Diagnostic Parameter				
Error message	**Diag. parameter and units**	**Shown on Gauge Diag. screen**	**Fault State**	**Recommended Action**
Gauge temperature is too high and the gauge should shutdown	Internal Temperature (°C)	Yes	>75°C	Check ambient temperature (0 to 50°C)
N/A	Time since last reboot (days/ hours)	Yes	N/A	N/A
N/A	Firmware version	Yes	N/A	N/A
Window contamination board fault	Window contamination board connected (YES or NO)	No	Raw window contamination level <200	Check window contamination board connections
Gauge power supply fault	+24V power supply (Voltage)	No	+24V rail < +20V	Gauge power low: **check 24vdc connection**
mother PCB 12V power fault	+12V mother PCB supply (Voltage)	No	±12V mother PCB >±5%error	Mother PCB fault: **change mother PCB**
signal PCB 12V power fault	+12V signal PCB supply (Voltage)	No	±12V signal PCB >±5%error	Signal PCB fault: **changesignal PCB**
signal PCB 5V power fault	+5V signal PCB supply (Voltage)	No	±5V signal PCB >±5%error	Signal PCB fault: **changesignal PCB**
primary reference signal error	signal channel 1	No	Signal cannot be kept within required limits	Reference signal error: **check with Nordson**
primary sample signal error	signal channel 2	No	Diag	Sample signal error: **is analyser looking at product?**

Diagnostic Parameter				
Error message	**Diag. parameter and units**	**Shown on Gauge Diag. screen**	**Fault State**	**Recommended Action**
auxiliary reference signal error	signal channel 3	No	Signal cannot be kept within required limits	Reference signal error: **check with Nordson**
auxiliary sample signal error	signal channel 4	No	Signal cannot be kept within required limits	Sample signal error: **is analyser looking at product?**
internal standard failed	internal standard error	No	Internal standard fails to deploy correctly	Internal standard error: **check with Nordson**
Motherboard ID fault	Motherboard present (startup check)	No	Cannot read Motherboard ID	Check motherboard connections
Signal board ID fault	Signal board present (startup check)	No	Cannot read signal board ID	Check signal board connections

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CHAPTER 10

10 Reference

10.1 Specifications

Dimensions		
	Width	490 mm
	Height	335 mm
	Depth	433 mm
	Weight	14 kg
Environmental sealing		IP65 to IEC60529 (NEMA 4 equivalent)
Pollution degree		Degree 1
Overvoltage category		II
Rotating Sampling speed		48rpm
Ambient Temperature Range		
	Storage	-20°C to 70°C
	Operating	0°C to 50°C
Humidity range		80% maximum (non-condensing) over full operating temperature range
Measurement Scope		Six measurements simultaneously
Power Supply		90 to 264V~, 47 to 63Hz, 100W
Beam patch diameter		28mm (approx.)

Connectors		
	2 x USB2 ports	1 Side, 1 Rear
	1 x Ethernet port	
	1 x mains IEC socket	

CHAPTER
11

11 Outline Drawings

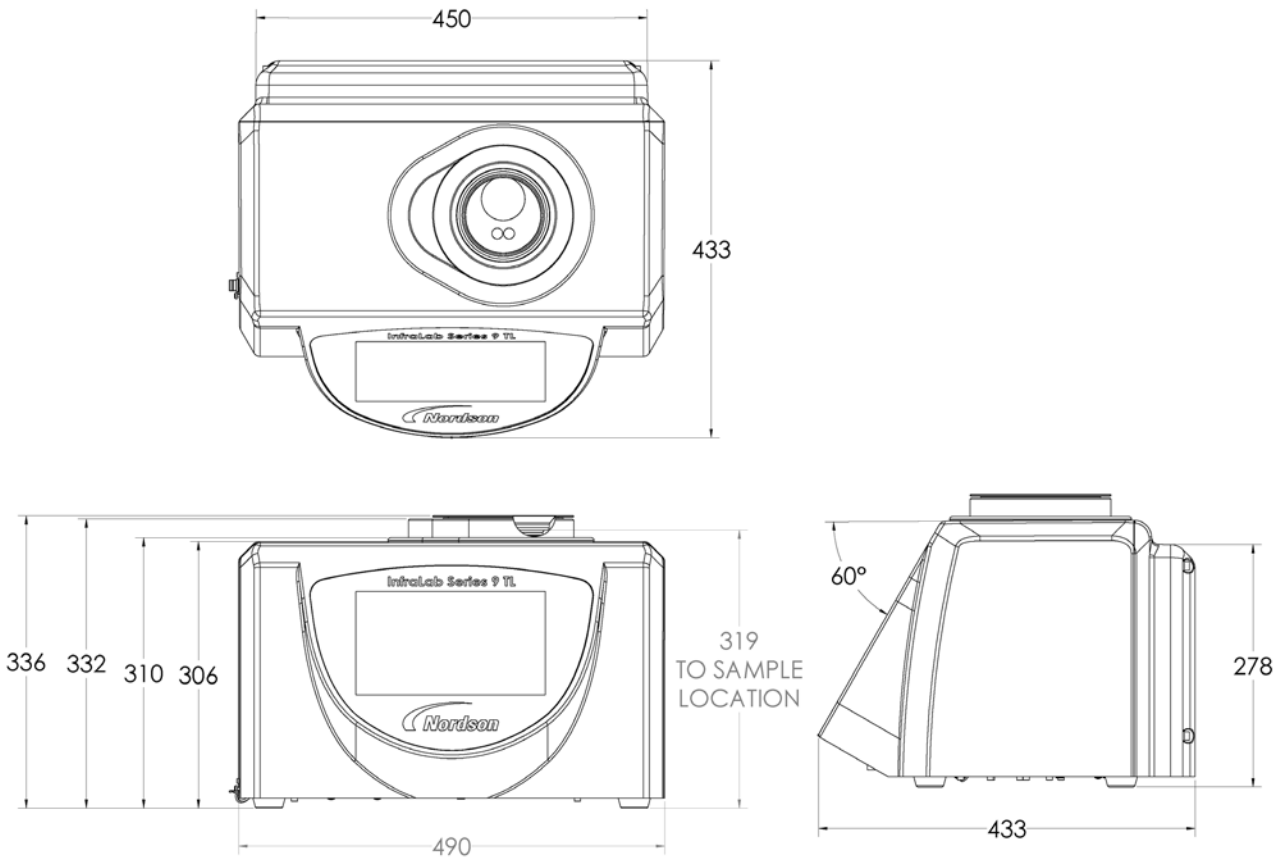

Figure 11-1 InfraLab TL: Outline Drawing

	All dimensions in mm

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CHAPTER
12

12 Servicing, Returns and Recycling

12.1 Servicing and Returning your Equipment

Your instrument was carefully inspected electrically and mechanically prior to shipment. It should be free of surface defects and scratches, and it should be in perfect working order upon receipt. If any indication of damage is found, file a claim with the carrier immediately, prior to using the instrument. If no damage is apparent, proceed by using this manual to install and setup this instrument.

Save the shipping carton and packing material for future storing or shipment of the instrument. If, at some future time, the instrument must be returned to the factory for service, include a full description of the instrument failure and the mode of operation the instrument was in at the time of failure. Also include a contact person to discuss the instrument failure.

When returning equipment for service, it is important to first obtain a Return Material Authorization (RMA) number. The RMA number is needed for proper handling of returned equipment.

- To obtain an RMA, go to https://ndc.custhelp.com/.
- To create a myNDC account, click the **Log in or Sign up** button. After creating the account, you will be immediately logged in. To log in on subsequent visits to myNDC, click the **Log in or Sign up** button, enter your username and password, and then click **Log in**.
- To submit an RMA, click on the **RMA Request** link and follow the on-screen instructions.

Ship the instrument in the original carton, or, if the original carton is unavailable, ship in a car- ton providing sufficient protection. Send the instrument to the Asia, Europe, or USA office, whichever is closest to you or to the office indicated by your sales engineer. Place the RMA number on the outside of the carton and include a purchase order number and any other information specific to your instrument. Field warranty service is available if the customer pays travel expenses by advance purchase order. All service operations should be performed by skilled electronics technicians, who have been trained by Nordson.

12.2 Recycling, Disposal and Sustainability

Nordson provides intelligent measurement and control solutions to help you focus on your unique mission in a more sustainable way. Better for your people. Better for your bottom line. Better for the planet. For this reason, Nordson encourages its customers to recycle and dispose of equipment in a way which is responsible and encourages sustainability.

Please check the following before disposing of your equipment:

- Is the equipment worth repairing? If in doubt, contact Nordson Service.
- If you are aware of any hazardous materials in your equipment, ensure qualified personnel take responsibility for its disposal. Some examples of hazardous substances include lead, mercury, cadmium, chromium VI, flame retardants, plasticizers, fluorescent tubes, monitors containing cathode ray tubes and products containing capacitors. Nordson is compliant with the European WEEE and the most current RoHS Directive.
- Can you re-use or recycle any constituent parts? For example, if the housing/chassis is made of metal, it can be recycled by your local authority. Ensure qualified personnel take responsibility for dismantling the equipment.

If the equipment does need to be disposed of, please dispose of it in a way that does not harm the environment.

Warranty

1. All sales of Nordson products are subject to the contractual terms and conditions of the Order pursuant to which they were sold to Buyer, including Warranty terms. The following terms are a general summary of the contractual Warranty terms, NOT a revision or alternative to the contractual terms, and are presented as merely a point of reference for your information. The contractual Warranty is the complete and exclusive statement of all Nordson warranties to Buyer. In the event the following terms are in conflict with any of the contractual Warranty terms, the contractual Warranty terms shall be deemed to control.

   The warranty terms contained herein are expressly in lieu of any and all other warranties, expressed or implied, including any warranty of merchantability or fitness for a particular purpose. In no event shall Nordson be liable for any incidental, consequential or special damages, including but not limited to, any loss of business, income or profits, expenses incurred for time when the system is not in operation, and any labor costs relating to or arising out of the performance, functioning or use of the system.

   Purchaser assumes the risk for use of this product and agrees to indemnify and hold Nordson harmless for any and all damage to person or to property resulting therefrom.

   Nordson grants no license under any patent rights except the right, under only such patents as may be owned or acquired by Nordson, to use the product sold hereby for the purpose for which it is sold. Nordson does not warrant that the product or its use does not infringe any patent owned by persons other than Nordson.

2. Nordson guarantees all products to be free from defects in material and workmanship for the following periods[1]:

   - Product and peripherals – 2 years from shipment
   - Source lamp – 5 years from shipment
   - Filter wheel motor – 5 years from shipment
   - Spare parts – 1 year from shipment
   - Replacement lamps and motors supplied under warranty – 1 year or up to the original 5 year warranty from shipment of the sensor, whichever is longer

   [1] Refer to the contractual terms and conditions of the Order for usage of the warranty.

   During this period, Nordson will repair or at its option replace, free of all charges for parts and labor, any Nordson parts determined by it to have been broken or damaged due to causes other than improper application, abuse or negligence. Nordson's obligation to repair or replace shall not extend to expendable parts which are subject to normal operating wear.

   Nothing in this paragraph 2 will require Nordson to make repairs or replacements where:

A. The product has been repaired, other than by an authorized Nordson dealer or a Nordson employee, or altered in any way without the prior written consent of Nordson; or

B. The product has not been properly maintained in accordance with any operating and maintenance manual supplied therewith; or

C. The product has been damaged as a result of fire, flood, war, insurrection, civil commotion, acts of God or any other cause beyond the control of Nordson or Buyer.

3. Nordson's liability shall be limited to the obligations set forth in Paragraph 2. These shall be the Buyer's sole and exclusive remedies, whether in contract, tort or otherwise, provided, however, that in lieu thereof, Nordson at its option may replace the entire product on an exchange basis or refund the purchase price against the return of the defective product.

4. Nordson will not be responsible for failure to provide service or parts due to shortage of materials, labor or transportation strikes or delays, or any causes beyond Nordson's control.

5. Unless otherwise specified by Nordson, all warranty repairs will be made at Nordson's facility. The customer shall be responsible for all expenses of packing, freight and insurance in connection with the shipment of products to Nordson for repair. Nordson will pay the cost of returning the equipment to customer.

   If it is mutually determined by the buyer and Nordson that the examination, replacement or repair takes place at the buyer's facility, then the buyer will be responsible for Nordson's travel and living expenses incurred in traveling to and from the buyer's facility, and during the time of the visit, as well as the cost of field labor and replacement parts unless the parts being repaired or replaced are determined to have been defective, in which event the cost of said repaired or replacement parts shall be borne by Nordson. These travel and living expenses will be billed to the buyer at actual cost to Nordson.

6. No person, including any Nordson distributor, agent or representative, is authorized to assume any liability on behalf or in the name of Nordson, and Nordson shall not be bound to any understandings, representations, or agreements with respect to warranties except as set forth in this policy.

7. Nordson requests immediate notification of any claims arising from damage in transit in order to determine if carrier responsibility exists. If damaged equipment arrives, save the shipping container for inspection by the carrier and telephone Nordson as soon as possible.