User's
Manual

EDDYFI LYFT

Corrosion Assessment Redefined

Eddyfi Technologies

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General Precautions

The following safety precautions are to be observed at all times when using Lyft®. Make sure that you review them **before** turning on the system.

- Keep this document in a safe place for future reference.
- Carefully follow the installation and operation procedures detailed herein.
- Respect the safety warnings on the instrument and in this document.
- Lyft should only be used by qualified personnel.
- When transporting Lyft, it is your responsibility to make sure that you apply the safety precautions dictated by the relevant local governing bodies.
- Always connect the power supply to a properly grounded receptacle, extension cord, or power bar. Grounding a single conductor of a two-conductor outlet is not sufficient protection for Lyft.
- Only connect the system to a power source corresponding to the type indicated on the rating plate.
- If you use the system in a manner that deviates from that specified by Eddyfi, the protection provided on the equipment may be rendered null and void.
- Do not use substitute parts or perform unauthorized modifications to the system.
- Service instructions, when applicable, are intended for trained service personnel only.
- Always make sure that the system is unplugged from any power supply before servicing.
- To avoid dangerous electric shock, do not perform any service on the system unless qualified to do so. If you encounter any problems or have questions regarding this system, contact Eddyfi or an authorized Eddyfi representative.

Safety Precautions

Observe the following safety precautions scrupulously when using Lyft.

Rear Stand

Because Lyft is a portable system, it is designed to be used under tough conditions. It is, however, not indestructible. To avoid damaging Lyft, use its rear stand when operating Lyft in a tilted position. Do not use Lyft in the upright position, as it may topple over or fall off the work surface.

Conventions

Typographical

The following typographical conventions are used throughout this document:

Italic
Used for file names and paths.

Bold
Used to indicate menu items, named user interfaces, and place emphasis on specific words or phrases. Items in bold type are capitalized to reflect the actual interface.

SMALL CAPITALS
Used to indicate instrument interface indications.

Marking and Symbols

The following symbols appear on the instrument and pertain to safety regulations that should be carefully observed:

This label is used as a general warning sign. It indicates that you should refer to this user's guide to obtain the necessary information for proper protection of the instrument and its users.

This label is used to indicate high voltage. It draws your attention to the presence of hazardous voltages (within the product enclosure or accessible externally) that may constitute a risk of electric shock to persons. Always refer to the user's guide to ensure proper protection and safety.

The RoHS compliance logo signifies that this product complies with the Restriction of Hazardous Substances directive 2002/95/EC. This directive restricts the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl, and polybrominated diphenyl ether in certain classes of electrical and electronic units as of July 1, 2006.

This label acts as a reminder that you should dispose of this system in accordance with your local Waste Electrical and Electronic Equipment (WEEE) regulations. This system was manufactured to the high quality standards of Eddyfi to ensure safe and reliable operation when it is used as stated in this document. Due to its nature, this instrument may contain small quantities of substances known to be hazardous to the environment and to human health if released in the environment. As such, systems falling under WEEE regulations should not be disposed of in the public waste stream.

Safety Indications in This Document

The safety indications in this document are intended to ensure your safety and the integrity of the system.

Warning

The warning indication calls your attention to a procedure or a practice (or the like) that, if performed incorrectly, can result in injury. Do not ignore warning indications — make sure that you understand the condition before proceeding.

Caution

The caution indication calls your attention to a procedure or practice (or the like) that, if performed incorrectly, can result in material damage, loss of data, or both. Do not ignore caution indications — make sure that you understand the condition before proceeding.

Important

Calls attention to information important to completing tasks.

Note

Calls attention to an operating procedure, a practice, or the like that requires special attention. Notes also indicate useful related, but parenthetical information that is unessential.

Acronyms

PEC: Pulsed eddy current

PECA: Pulsed eddy current array

CWT: Compensated wall thickness

EMC Directive Compliance

FCC Compliance (USA)

This equipment was tested and found to comply with the limits for a Class A digital device, pursuant Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case you will be required to correct the interference at your own expense.

ICES Compliance (Canada)

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

AS/NZS Compliance (Australia/New Zealand)

This device complies with Australia and New Zealand AS/NZS 4252.2 (IEC 61000-6-4) and AS/NZS 61000-6-2 (IEC 61000-6-2).

Calibration and Warranty Seals

The calibration seal is at the back of the instrument. Lyft is also equipped with a warranty seal.

Important

Broken seals void the calibration certification and product warranty.

Limited Warranty

Eddyfi NDT, Inc. warrants the hardware to be free of any defects in materials or workmanship for a period of twelve (12) months from the date of delivery, under normal use and service. These warranties are limited to the original purchase of the product and are not transferable.

Eddyfi NDT, Inc. will repair or replace any product component or documentation, at its option and at no additional charge, if found defective within the warranty period. The purchaser is responsible for returning the product to Eddyfi NDT, Inc.

Eddyfi NDT, Inc., will not be held responsible in any way whatsoever for damage resulting from improper installation, accident, misuse, or from service or modification of the product by anyone other than Eddyfi NDT, Inc., or an authorized Eddyfi NDT, Inc. service center.

Eddyfi NDT, Inc. will not be held responsible in any way whatsoever for direct, indirect, special, incidental, or consequential damages resulting from possession, use, improper installation, accident, service, modification, or malfunction of the product (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss). Eddyfi's total shall in no event exceed the purchase price of the applicable item(s).

This warranty is in lieu of all other warranties, whether oral, written, expressed, or implied, including any warranty of merchantability or fitness for a particular purpose, and no other representation or claims of any nature shall be binding on or obligate Eddyfi NDT, Inc.

This agreement is governed by the laws of the province of Québec, Canada. Each of the parties hereto irrevocably attorns to the jurisdiction of the courts of the province of Québec and further agrees to commence any litigation which may arise hereunder in the courts located in the judicial district of Québec.

Copyrights

This document was prepared with particular attention to usage to ensure the accuracy of the information it contains. It corresponds to the version of the product manufactured prior to the date appearing on the back cover. There may, however, be some differences between this document and the product, if the product was modified after publication.

The information contained in this document is subject to change without notice.

Chapter 1

Lyft System Overview

Introducing the Lyft System

Thank you for purchasing the Eddyfi® Lyft® system. This chapter offers an overview of the system, its components, and probes.

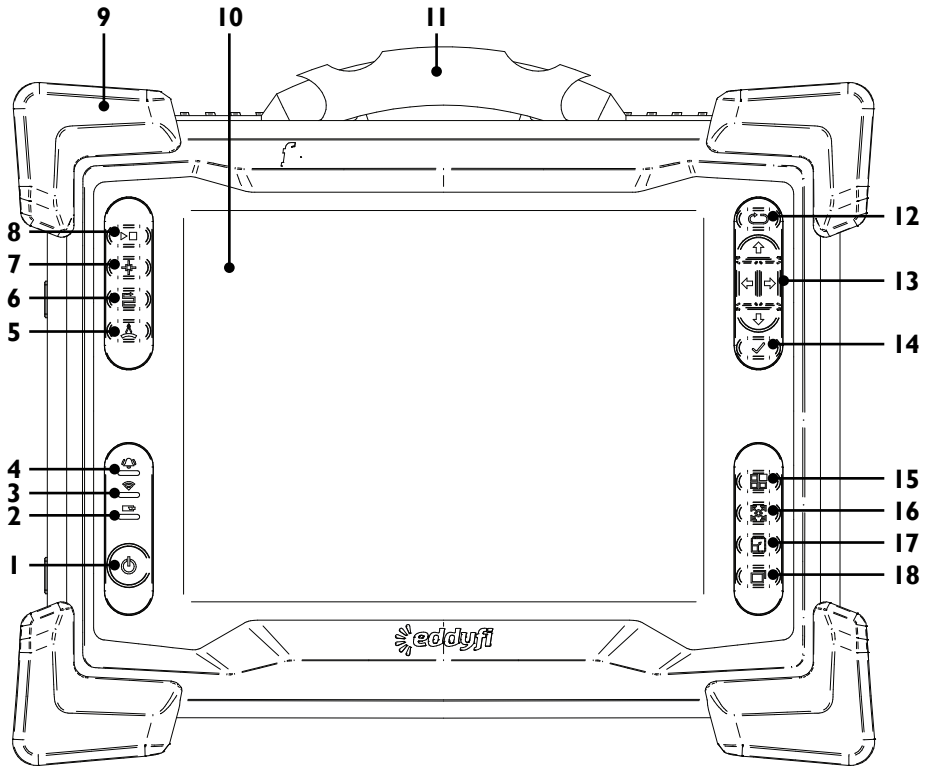
What is in the Box

Lyft comes with the following standard accessories:

- Two, high-capacity batteries
- One power adapter (100–240 V)
- Power cords (one for North America, one for Europe)
- User documentation
- Stylus
- Transport case

Instrument Overview

Front



1. **Power button**

   Use to turn the instrument on and off. The power indicator at the center of the button behaves as follows:

   - Green: Lyft is on
   - Blinking yellow/orange: Lyft is on standby
   - Unlit: Lyft is off

2. **Battery indicator**

   Displays the state of the batteries when the instrument is on. Depending on the power mode (DC or battery), the indicator behaves differently:

   DC power

   - Green: batteries fully charged
   - Blinking green: batteries charging
   - Red: battery or charger error
   - Unlit: no batteries

   Battery power

   - Unlit: remaining charge over 40%
   - Orange: remaining charge 20–40%
   - Blinking yellow: remaining charge less than 20%
   - Red: battery error

3. **Wi-Fi indicator**

   Displays the Wi-Fi status. When the indicator is lit, the Wi-Fi is enabled. When it is off, the Wi-Fi is disabled.

4. **Alarm indicator**

   Used to display user- programmed errors. The indicator remains unlit until it detects a predefined error condition, at which time it lights red.

5. **Wall thickness calibration button**

   Use to perform a wall thickness calibration on the nominal thickness. A short press calibrates on a new point, while a long press calibrates on the data at the cursor's location.

6. **Index button**

   Use to increment the index line during data acquisition.

7. **Get point button**

   Only use during data acquisition in grid-mapping mode. It allows performing a measurement at the cursor coordinates.

8. **Start/Stop acquisition button**

   Use to start or stop data acquisition.

9. **Heavy-duty bumpers**

   The four corner bumpers provide shock absorption and support Lyft at an angle when it is set on a flat surface. The bumpers are also hooked for harnessing. For details about harnessing, see page 70.

10. **Multi-touch display**

    10.4", non-reflective, backlit, high-resolution display.

11. **Handle**

    Use this handle to carry Lyft.

12. **Keypad arrow mode selection/Disable touchscreen button**

    Press to select the operation mode of the keypad arrows (see 13). Long press this button to enable or disable the touchscreen (depending on its state). Follow the instructions on the screen to complete the operation.

13. **Keypad arrows**

    Use these arrows to navigate the Lyft software interface according to the selected mode.

14. **Enter button**

    Unused at this time.

15. **Change active view button**

    Press to activate a different view than the one currently active.

16. **Data display button**

    When PECA probes are connected to the instrument: used to activate probe guides in C-scans. Unused with single-element probes.

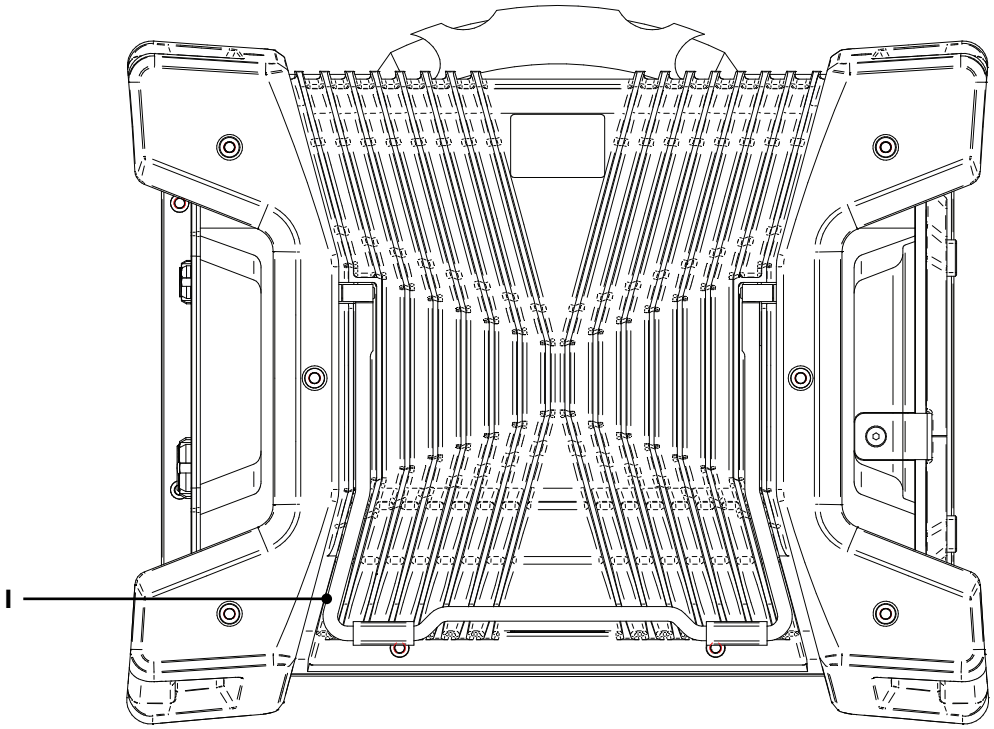
17. **Maximize/Minimize view button**

    Use to maximize or minimize the active view.

18. **Change layout button**

    Use to change the Lyft software layout to another predefined one.

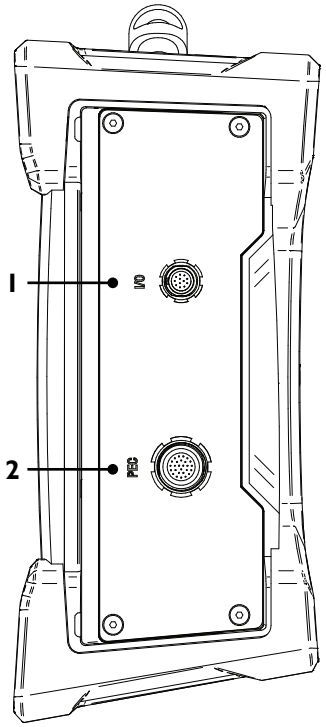
Rear



1. **Instrument stand**

   The stand retracts outward to hold Lyft at an angle, preventing the instrument from tilting over horizontally.

Right



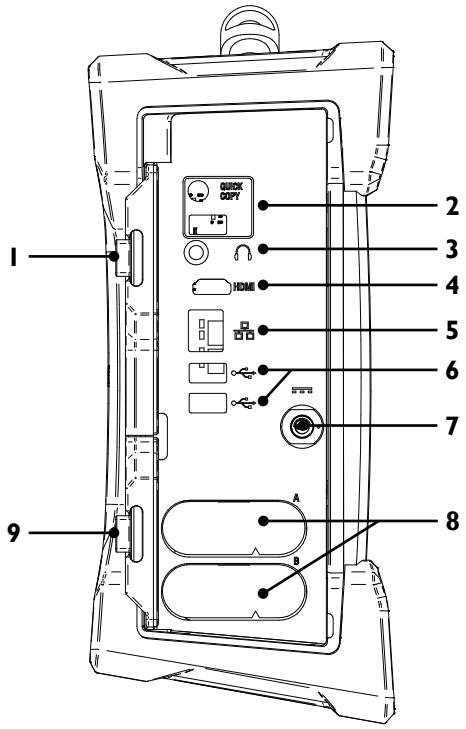
1. **I/O connector**

   Used to communicate with the probe's encoder, for example.

2. **PEC connector**

   Connect your PEC probes to this connector.

Left



1. **Protective connector door**

   Protects the Lyft connectors from the elements when they are unused.

2. **Quick Copy**

   Use to transfer all your inspection data to a USB mass storage device.

3. **Audio connector**

   Use to plug a headset to Lyft.

4. **HDMI® connector**

   Use to connect an external monitor to Lyft.

5. **Network connector**

   Use to connect Lyft to a local area network (LAN). The connector is equipped with two indicators with the following behaviors:

   Connection indicator (upper)

   - Green: communication established with the network
   - Blinking green: activity between Lyft and the network
   - Unlit: no link to the network

   Connection speed indicator (lower)

   - Amber: operating as a gigabit connection (1 Gbps)
   - Green: operating as a 100 Mbps connection
   - Off: operating as a 10 Mbps connection

6. **USB 2.0 connectors**

   Use to connect USB devices to Lyft such as a mouse or an external disk drive.

7. **Power connector**

   Use the supplied power cord to operate Lyft and recharge its batteries.

8. **Battery compartments**

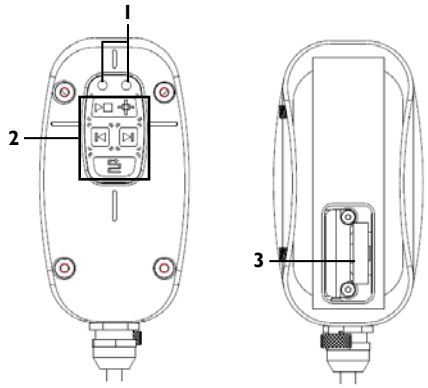
   Insert the supplied batteries into the compartments. For details about batteries, see Batteries on page 10.

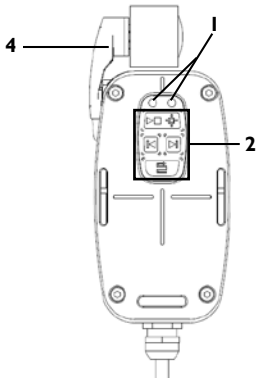
9. **Protective battery compartment door**

   Protects the battery compartments from the elements.

Single-Element Probe Overview

Lyft single-element probes come in three sizes: small, medium, and large. They feature the following components.





First-generation probes

1. **Status LEDs**

   The green LED on the left and the red LED on the right convey information to users, as outlined below.

2. **Remote controls**

   Used to perform a variety of operations without handling the instrument. See page 41.

Second-generation probes

3. **Built-in encoder**

   First-generation probes are equipped with a high- precision, 20.53 counts/mm encoder.

4. **Clip-on encoder**

   Second-generation probes are equipped with high-precision, 16.04 counts/mm encoder.

Table 1 Lyft single-element probe status LEDs

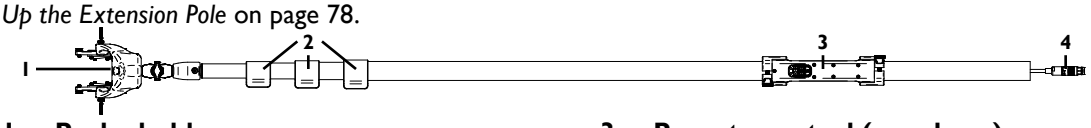
Green	Red	Status
Off	Off	Probe unconnected or unable to receive data.
1 Hz blinking (slow)	Off	**Analysis mode:** Probe detected and waiting for action.
10 Hz blinking (normal)	Off	**Acquisition mode:** Data is being acquired. **PEC** Autoset: Routine is running. **Wall thickness calibration:** Routine is running. **Repeatability optimization**: Routine is running.
20 Hz blinking (fast)	Off	**Dynamic acquisition mode:** The probe's position is outside the scan zone.
20 Hz blinking (fast)	20 Hz blinking (fast)	**PEC Autoset:** Routine failed or was canceled. **Wall thickness calibration:** Routine failed or was canceled. **Repeatability optimization:** Routine failed or was canceled.
On	Off	**Grid mapping acquisition mode:** Probe ready to perform acquisition. **PEC Autoset:** Probe ready to perform routine. **Wall thickness calibration:** Probe ready to perform routine. **Repeatability optimization:** Probe ready to perform routine.
Off	On	**Dynamic acquisition mode:** Probe moving too quickly on sample. **Other circumstances:** Error occurred during requested operation.

Single-Element Probe Accessories

For details about these accessories, refer to the PEC probe catalog.

Single-Element Extension Pole Overview

For details about how to install a single-element or splash zone probe on the extension pole, see *Setting Up the Extension Pole* on page 78.

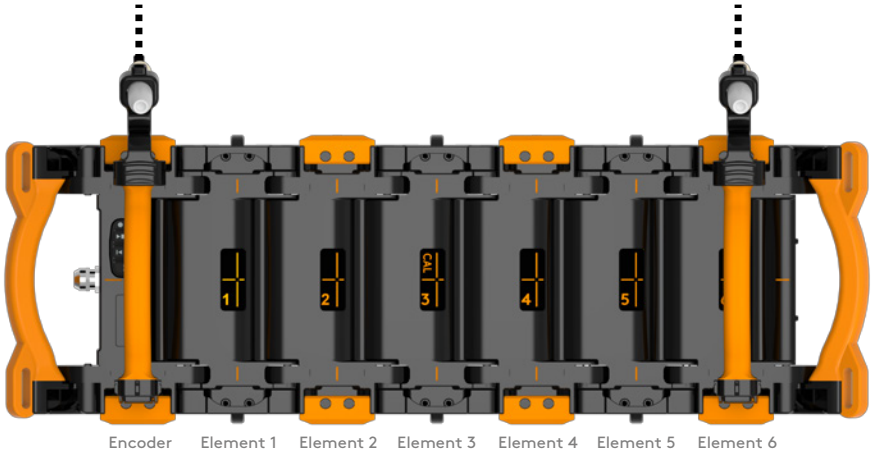


1. **Probe holder**
2. **Extension rings**
3. **Remote control (see above)**
4. **PEC connector**

PECA Probe Overview

The PECA-6CH-MED-XXX-GA and PECA-6CH-MED-XXX-GDA 6-element PECA probes are capable of a single-pass coverage of 457 mm (18 in) in grid or high-resolution, dynamic mode.

Figure 1 PECA probe



PECA probes roll on wheels that lift them off 12.7 mm (0.5 in) to ease inspection on insulated pipes with straps and buckles securing the insulation. Do not add this additional liftoff to the insulation thickness when calculating your probe's footprint or smallest detectable defect. You can remove the wheels to use the probe in restricted-access situations.

PECA probes are also designed to wrap around curved surfaces like pipes. Once curved, lock the shape by pressing the locking handles toward the probe's body. You will get the best sizing results when all the probe elements are curved by the same amount, forming a circular arc. Positioning marks are visible on the probe to validate the relative curvature of all array elements. To see how to lock and unlock the probe body, see appendix D.

The probes are equipped with the same buttons as single-element probes. The red, green, and blue LEDs indicate the operational status of the probes.

Table 2 PECA probe status LEDs

Green	Red	Blue	Status
Off	Off	–	Probe unconnected or unable to receive data.
1 Hz blinking (slow)	Off	–	**Analysis mode:** Probe detected and waiting.
10 Hz blinking (normal)	Off	–	**Acquisition mode:** Data being acquired. **PEC Autoset:** Routine running. **Wall thickness calibration:** Routine running. **Repeatability optimization:** Routine running.
20 Hz blinking (fast)	Off	–	**Dynamic acquisition mode:** The probe's position is outside the scan zone.
20 Hz blinking (fast)	20 Hz blinking (fast)	20 Hz blinking (fast)	**PEC Autoset:** Routine failed or canceled. **Wall thickness calibration:** Routine failed or canceled. **Repeatability optimization:** Routine failed or canceled.
On	Off	–	**Grid mapping acquisition mode:** Probe ready to acquire. **PEC Autoset:** Probe ready to perform routine. **Wall thickness calibration:** Probe ready to perform routine. **Repeatability optimization:** Probe ready to perform routine.
Off	On	–	**Dynamic acquisition mode:** Encoder is moving. Blue LED is off if red LED is active. **Other circumstances:** Error occurred during requested operation.
–	–	On	**Dynamic acquisition mode:** Typically used to confirm that the encoder is in contact with the component. **Other circumstances:** Unused.
–	–	Off	**Dynamic acquisition mode:** Encoder is stopped. **Other circumstances:** Unused.

PECA Probe Accessories

For details about PECA probes accessories, refer to the PEC probe catalog. To learn how to install the probe on a pipe using accessory straps and carriages, see Appendix D on page 81.

Application-Specific Probes and Accessories

For details about the splash zone, underwater, galvanized-steel, and tank floor probes, as well as cables and other PEC accessories, refer to the PEC probe catalog.

Positioning Lyft

Lyft must be properly positioned prior to use so that you do not run the risk of dropping the instrument or the instrument falling over. Lyft has **two** safe operating positions: horizontal and tilted. To use there a tilted position, simply pull out the stand located at the rear of the instrument until Lyft is at the desired angle. If you are using Lyft with the optional harness, see *Adjusting the Harness* on page 70 for details.

Figure 2 Lyft in horizontal position

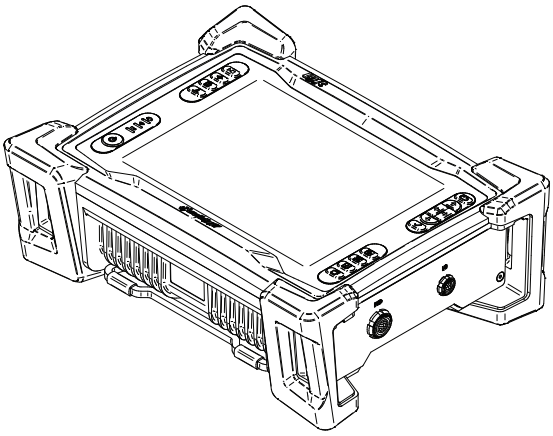
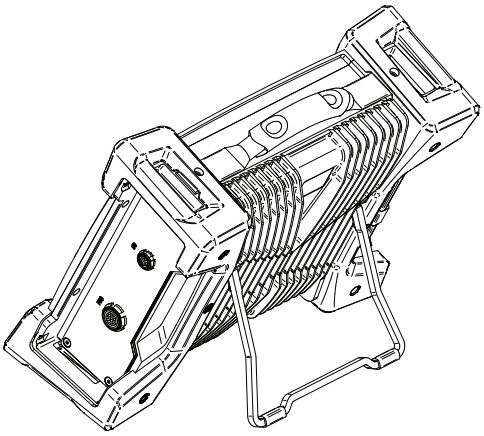


Figure 3 Lyft in tilted position



Caution

It is possible to use Lyft while it rests on its lower bumpers, but this is not a safe operational position as the instrument may fall over. If you want to use Lyft at an angle, use the stand located at the rear of the instrument.

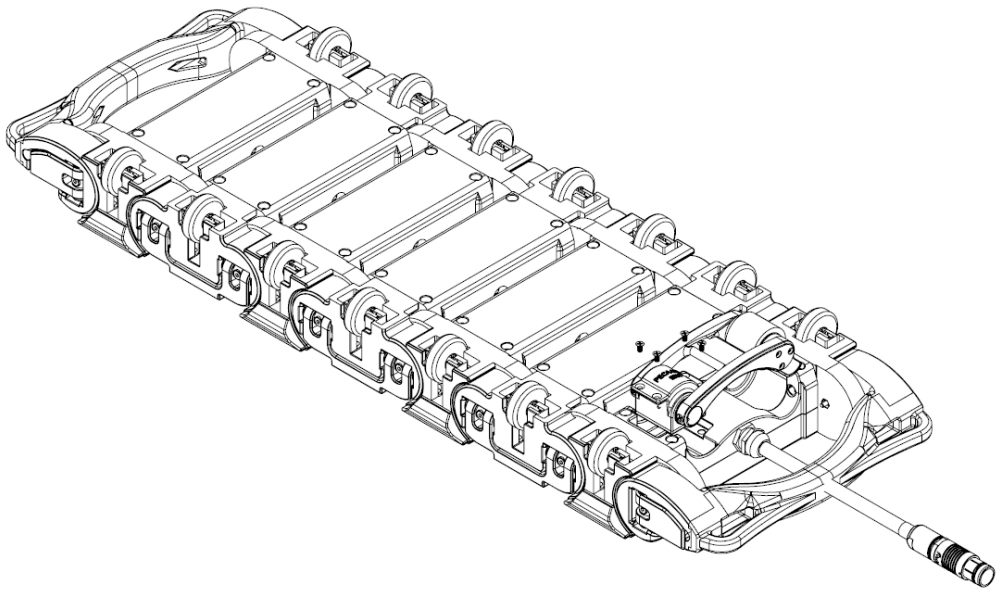
Important

Regardless of how you position the instrument, you must always have a minimum clearance of 10 cm (4 in) on all sides of the instrument. Always position the instrument away from heat sources. This ensures proper heat dissipation while the instrument is in use.

Removing the PECA Probe Encoder

The GDA probe is equipped with a detachable encoder. The encoder can be retracted when it is not used. To remove the encoder, place the probe on a secure surface and unscrew the four screws visible at the base of the encoder arm when the probe is upside down.

Figure 4 PECA probe encoder removal



Calibrating PECA Probes

The probe is calibrated using the element 3 (marked CAL) as a reference. Refer to the PECA training material for details.

Starting Lyft

Proceed as follows to turn on your instrument or exit the standby mode:

1. Make sure that at least one of the two batteries is inserted into battery compartment A of the instrument or that the instrument is plugged to an external power source using the supplied power cord.
2. Press the power button.

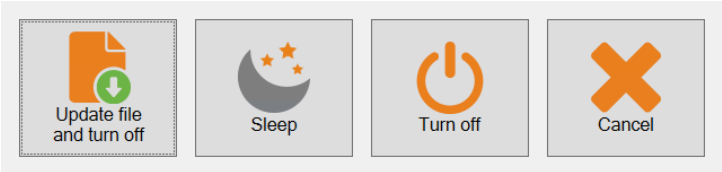
   The power indicator at the center of the power button lights green.

Shutting Down Lyft

Proceed as follows to shut down your instrument:

1. Save all your data.
2. Press the power button.
   Four options are available.

Figure 5 Shutting down Lyft



3. Tap the button of your choice.
   The instrument shuts down.

Connecting Probes

Connecting a PEC Probe

Eddyfi PEC probes come in three models: small, medium, and large. These probes hook up to Lyft's PEC connector. Proceed as follows to do so:

1. If you have not already done so, remove Lyft from its carrying case and place it on your working surface as outlined in Table 2 on page 7.
2. If you have not already done so, remove the protective caps from the PEC and I/O connectors.
3. Align the probe's 27-pin male connector with the PEC connector on the instrument.
   Hint
   The alignment mark on the connector should be facing you when you face the instrument.
4. Push the connector until you hear it click.
5. Align the probe's 12-pin male encoder connector with the I/O connector on the instrument.
   Hint
   The alignment mark on the connector should be facing you when you face the instrument.
6. Push the connector until you hear it click.

Batteries

Lyft can be used under battery power. The instrument is designed with two battery cradles under the protective battery compartment door, but can be powered by a single battery. Lyft uses Li204SX-7800 lithium-ion rechargeable batteries from Emerging Power, which do not suffer from the memory effect affecting previous generations of batteries.

Warning

Whenever carrying Lyft in its transport case, remove the batteries from the instrument and make sure that they cannot come in contact during transport, as this poses a significant fire and explosion hazard.

When carrying Lyft, it is the user's responsibility to make sure that the safety precautions used are in accordance with the local department of transportation (or equivalent governing body) rules and regulations.

Lyft's transport case comes with two slots, fitted to receive the batteries when removed from the instrument.

Note

Make sure that you do not replace the batteries by batteries other than Li204X-7800 lithium-ion rechargeable batteries from Emerging Power. Contact your Eddyfi representative for more information about pricing and availability or replacement batteries.

Inserting/Removing Batteries

Inserting Batteries

1. On Lyft's left side, unlatch the battery compartment's door, and then open it.
2. Align your battery with one of the battery cradles.

   Note

   Battery cradles are marked A and B. If you are inserting only one battery, it does not matter which of the two cradles you use.
3. Make sure that the battery contacts are facing inward and upward.
4. Slide the battery into the battery cradle until it is fully inserted. You should feel the battery contacts snap into place.

Removing Batteries

1. On the left side of Lyft, unlatch the battery compartment's door, and then open it.
2. Grab the battery tab between thumb and forefinger.
3. Pull on the tab.

   You will feel the battery contacts being released.
4. Slide the battery out of its cradle.

Hot Swapping Batteries

You can remove one of the Lyft batteries when the instrument is turned on as Lyft can operate with a single battery. Should the power in the remaining battery be insufficient to keep Lyft operating, the instrument shuts down without damaging electronic components, but all your work in progress in the Lyft software (acquisition, etc.) is lost.

Charging Batteries

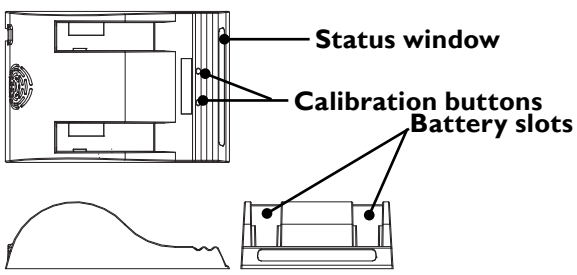
Note

Batteries do not recharge when their internal temperature exceeds 45 °C (113 °F). Batteries also do not power Lyft when the instrument's internal temperature exceeds 55 °C (131 °F).

Using the Optional Battery Charger

An optional battery charger is available from Eddyfi. Contact your Eddyfi representative for more information about pricing and availability. This charger conditions and calibrates the instrument's batteries, which is important to maximize their lives. We recommend calibrating the batteries every six months.

Figure 6 Optional battery charger



To charge the batteries with the optional charger:

1. Place the charger on a flat and level surface, away from heat and moisture sources.
2. Insert the power supply's DC connector into the back of the external charger.
3. Connect the power supply to an AC supply using the supplied cable. All the LEDs flash momentarily to let you know that power is present.
4. Insert the batteries into the battery slots while making sure that the contacts are fully seated.

   The charger automatically begins charging the batteries and the LEDs in the status window display the following information:

   - Blinking green: battery charging
   - Green: battery fully charged
   - Blinking blue: battery calibrating
   - Blue: battery charge gauge calibrated
   - Blinking red: battery charge gauge in need of calibration
   - Red: error

Calibrating Batteries

To ensure that your batteries perform at their full capacity for the longest possible time, it is important to calibrate them on a regular basis. Calibration involves a standard battery charge followed by a deep discharge, and then a complete charge. This procedure usually takes 10 to 13 hours, whereas a standard charge only takes approximately 3.5 hours.

Calibrate batteries by placing them in the optional charger and then pressing the calibration button. We recommend calibrating your batteries at least every six months.

Storing Batteries

Whenever transporting Lyft in its case, remove the batteries from the instrument, place them in plastic bags, and then make sure that they cannot come in contact during transport, as this is a significant fire and explosion hazard. Lyft's transport case is outfitted with two slots intended for the batteries. We recommend that you take advantage of them.

Chapter 2

Software Overview

Introducing the Lyft Software

The software running on Lyft is a powerful and easy-to-use acquisition and analysis software. It is specifically designed for pulsed eddy current inspections and relies on intuitive wizards to configure setups.

The software benefits from a graphical user interface (GUI) designed to simplify the inspection process and enhance your experience. The multi-touch display is the best way of interacting with Lyft, but you can also use a USB mouse and keyboard, if necessary.

Through the GUI, all the functions associated to inspection project management, the global settings, and the preferences are in what is referred to as the backstage view. All inspection work, calibration, acquisition, and analysis is in what is referred to as the front-stage view. This is how the software offers a streamlined and coherent interface that makes the learning process easy.

Backstage Overview

The backstage view is composed of five sections.

General Section

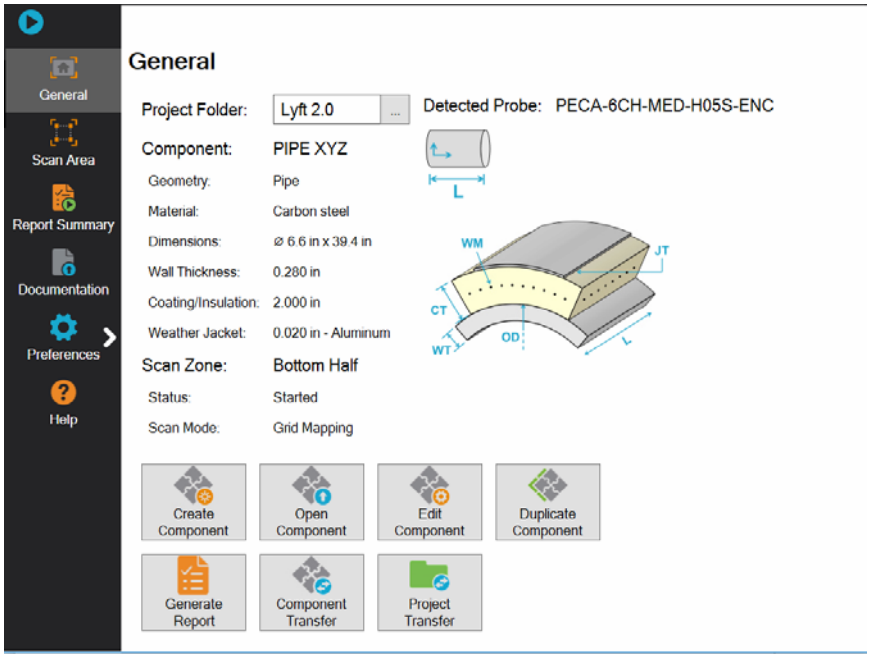
The default section and first section of the backstage view is the **General** section, which contains information about:

- Probe currently connected to Lyft
- Component description (pipe, insulation, jacket)
- Current scan zone

This is where you:

- Select project folders
- Create, open, edit, or duplicate components
- Transfer components and projects
- Generate reports

Figure 7 Backstage view: General



Scan Area Section

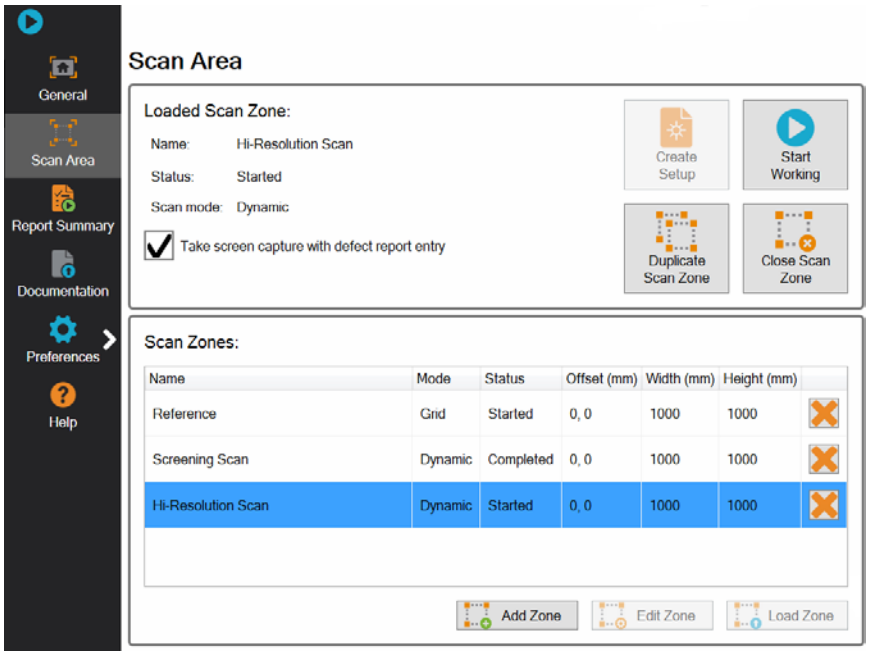
This section of the backstage contains information about the loaded scan zone and all the scan zones of the component. This is where you (upper portion of the view):

- Create setups
- Start inspections
- Duplicate the loaded scan zone
- Close scan zones for modification

Also (bottom portion of the view):

- Add new scan zones
- Delete scan zones
- Edit scan zones
- Load scan zones

Figure 8 Backstage view: Scan Area

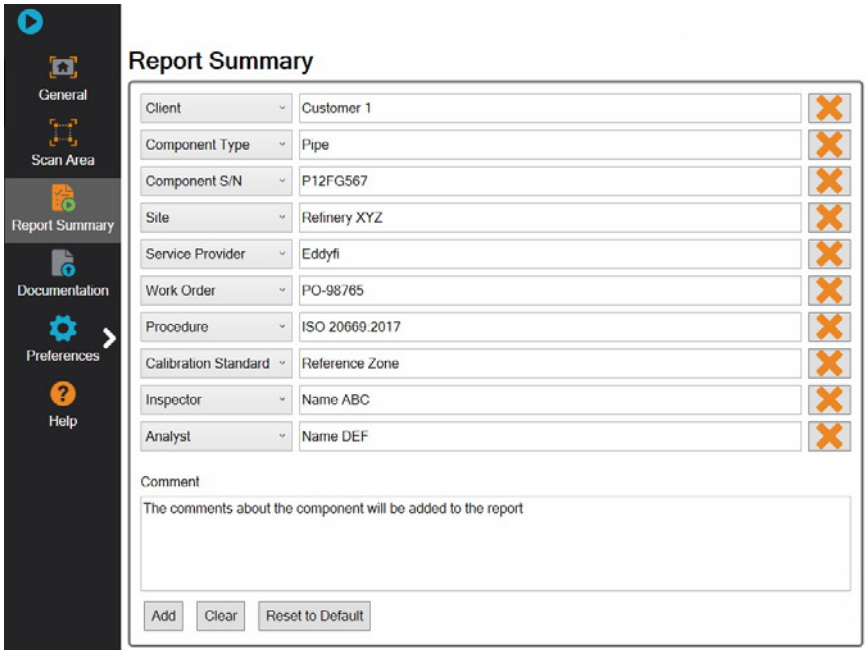


Report Summary Section

This section of the backstage serves to configure the summary included with your reports. This is where you can:

- Add information about the component type, serial number, operator, service company, etc.
- Create new information fields to be included in reports
- Add comments about the component inspection

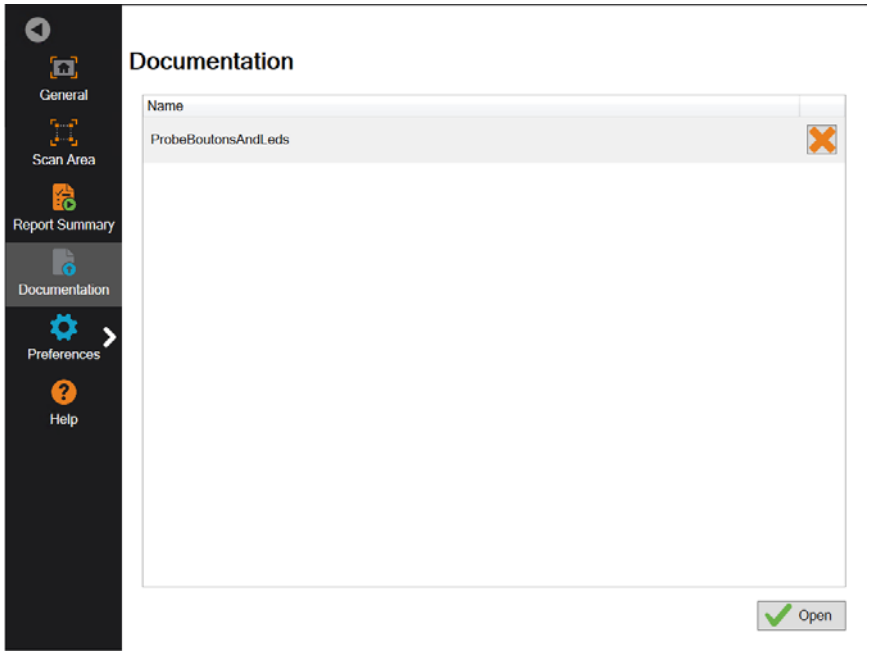
Figure 9 Backstage view: Report Summary



Documentation Section

This section of the backstage allows you to open PDFs located in the **UserData** folder of the instrument. Opening a PDF here can display the document full page for easier reading.

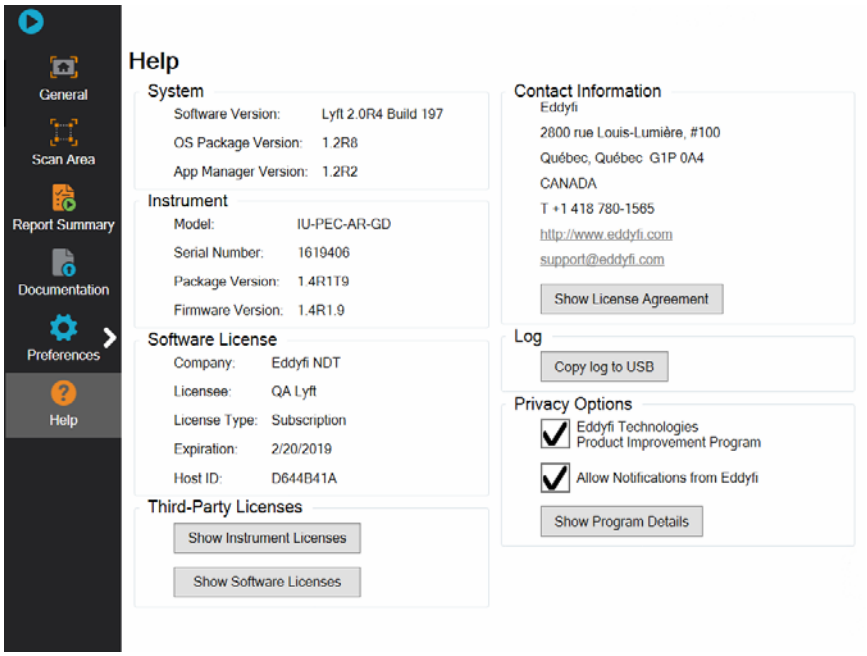
Figure 10 Backstage view: Documentation



Help Section

This section of the backstage contains information about your instrument/software version and license details. You can also use this section to copy a log file to a USB mass storage device in case you need support for a specific problem you have with the system.

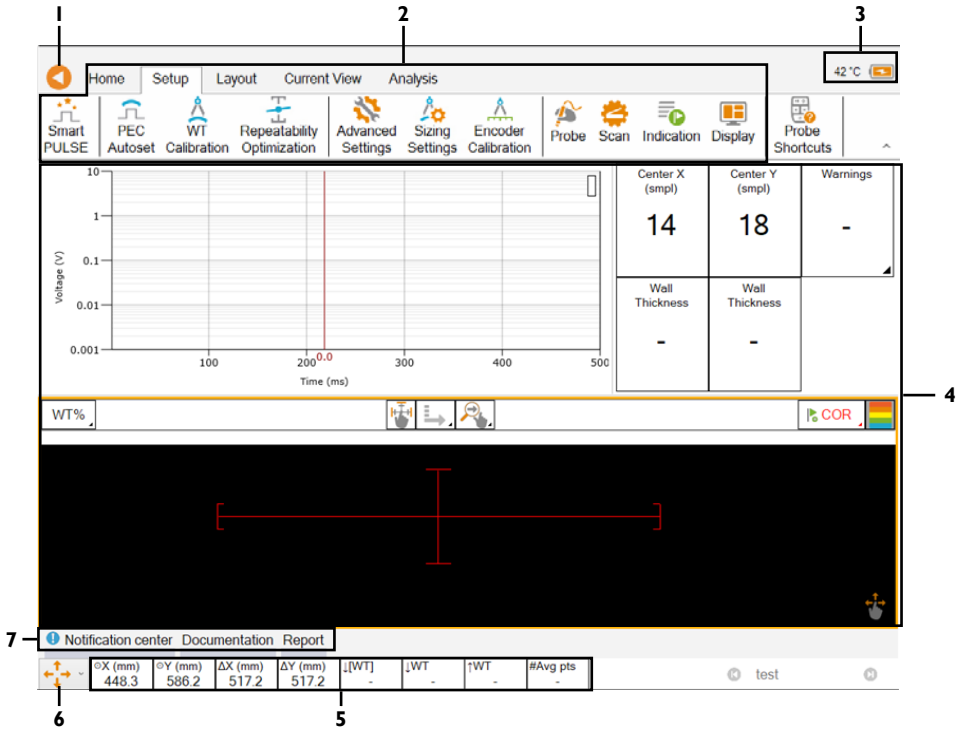
Figure 11 Backstage view: Help



Front Stage Overview

The front stage displays all the information about your current inspection. This is where you will find all the tools to acquire, save, and analyze inspection data.

Figure 12 Front-stage view



1. **Backstage icon**

   Tap to access the backstage view.

2. **Ribbon-style menus**

   These five menus allow you to perform several inspection operations. Read on for details.

3. **Status icons**

   These icons convey unit status information graphically. Keep reading for details.

4. **Data display**

   This area is where you see the inspection data.

5. **Information**

   This area displays information about the cursor position, thickness measurements, and acquisition parameters.

6. **Keypad arrow mode selector**

   Tap to change the operational mode of the keypad arrows. See chapter 1 for details.

7. **Information tabs**

   Tap the tabs to display notifications, documentation, or report content. Continue reading for details.

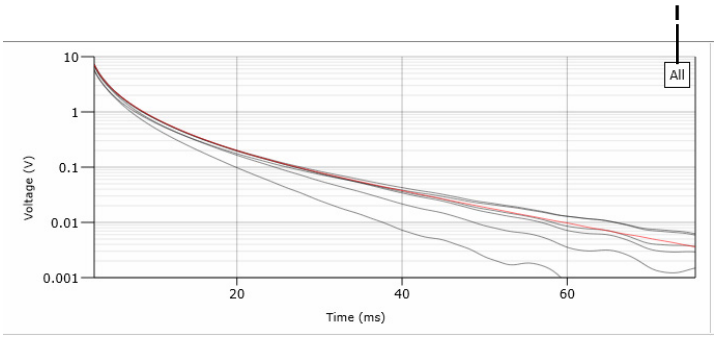
Views

Views vary according to the type of probe you are using. You can select layouts or set one up yourself. This section introduces the various elements of available views.

A-Scan View

The A-scan view displays the decay signal acquired by the probes. When using pulsed eddy current array, signals from all channels are simultaneously displayed here.

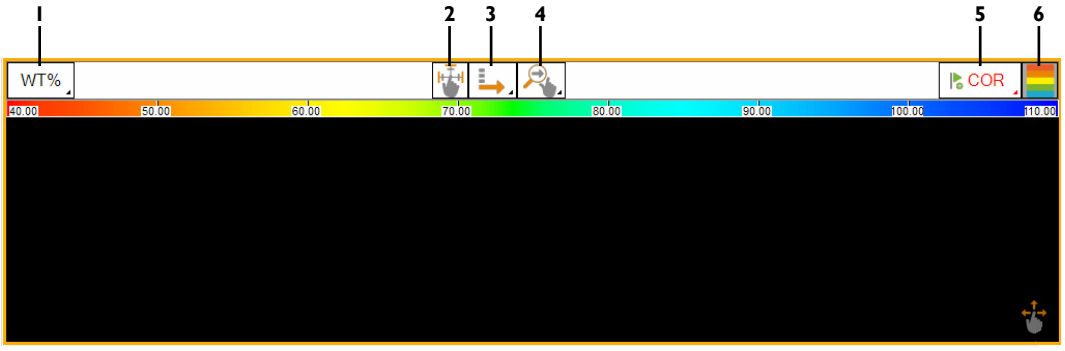
Figure 13 Pulsed eddy current array A-scan view



1. Channel displayed in the A-scan.

C-Scan View

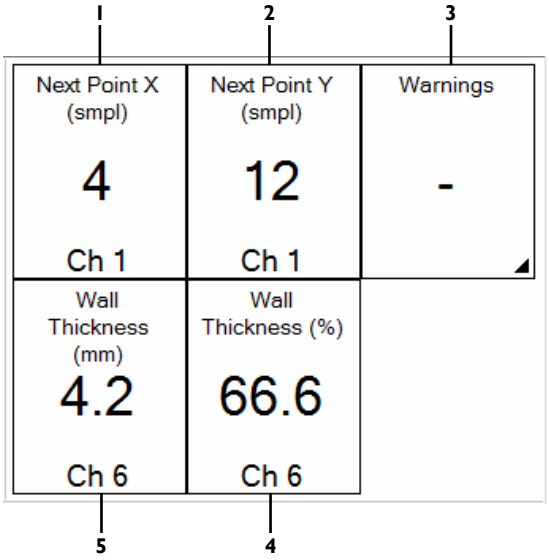
Figure 2–8 C-scan view



1. **Wall thickness C-scan selector**
   Options are:
   - WT%: remaining wall thickness in % according to the nominal wall thickness
   - WT: absolute remaining wall thickness
   - WL%: wall loss in % according to the nominal wall thickness
   - CWT% (only available in Lyft Pro): compensated remaining wall thickness in % according to the nominal wall thickness
2. **Resize cursor button (toggle behavior)**
3. **Cursor axis selection for Resize action**
4. **Zoom orientation selection for the pinch action**
5. **Report code button used to select/add indications to the report table**
6. **Show/Hide color palette in the view**

Information View

Figure 14 Information view



When using an array probe:

1. During acquisition: next position to be acquired on channel 1's X axis.

   During analysis: cursor position of selected point on the X axis, regardless of the channel used to capture the point.

2. During acquisition: next position to be acquired on channel 1's Y axis.

   During analysis: cursor position of selected point on the Y axis, regardless of the channel used to capture the point.

3. Saturation, over speed, and bad data fitting warnings. Clicking **Warnings** opens the **Warnings Information** dialog box.
4. During acquisition: minimum wall thickness (in percentage) on all array channels. The channel where the minimum is measured is indicated at the bottom.

   During analysis: wall thickness (in percentage) at the cursor position, regardless of the channel used to capture the point.

5. During acquisition: minimum wall thickness (in measurement units) on all array channels. The channel where the minimum is measured is indicated at the bottom.

   During analysis: wall thickness (in measurement units) at the cursor position, regardless of the channel used to capture the point.

When using a single-element probe:

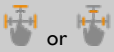
1. During acquisition: next position to be acquired on the X axis. During analysis: cursor position on the X axis.
2. During acquisition: next position to be acquired on the Y axis. During analysis: cursor position on the Y axis.
3. Saturation, over speed, bad data fitting warnings. Clicking **Warnings** opens the **Warnings Information** dialog box.
4. Wall thickness (in measurement units) at the cursor position.
5. Wall thickness (in percentage) at the cursor position.

Multi-Touch Interface

The Lyft multi-touch interface is designed for ease-of-use. According to your location in the software, the multi-touch behavior changes.

The backstage view uses , dialog boxes, and setup wizards, the multi-touch behavior is standard: a short tap on an element of the GUI enables the associated function, exactly as it would at the click of a mouse. The table below summarizes the various behaviors according to the view you are using.

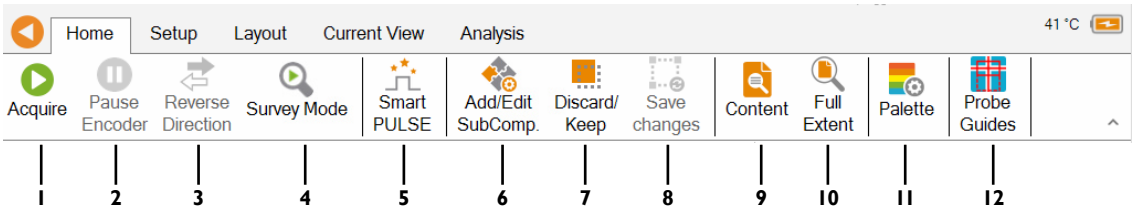
Table 3 Multi-touch behavior in C-scan view

Location	Touch	Behavior	Condition
View toolbar	Tap	PList buttons: Select the next option in list Toggles: Enable/disable option	
	Touch and hold	List buttons: Display entire options list	
Data area	Tap	Move cursor to tapped position	
	Touch and move	Move cursor in C-scan Resize the main cursor or miniature cursor along selected axis	 or
	Pinch-zoom in or out	Zoom in/out according to mode	

Front Stage Details

Home Ribbon

Figure 15 Home ribbon



1. **Acquire**

   Tap to start and stop data acquisitions.

2. **Get Point (grid mode)**

   Tap to make one-point measurements. Only available in grid mode.

   Pause Encoder (dynamic mode)

   Tap to pause the encoder before indexing or repositioning your probe. Only available in dynamic mode.

3. **Reverse Direction**

   During grid acquisition, tap to change the direction of the automatic increment.

4. **Survey Mode**

   Tap to enable the survey mode and acquire data without consigning it to the C-scan. The data remains in memory and allows you to look at different locations before recording. With array probes, the acquired data comes from element 3.

5. **SmartPULSE**

   Tap to perform a complete system calibration, including PEC Autoset, WT Calibration, and Repeatability Optimization.

6. **Add/Edit Sub-Comp.**

   Tap to add a new or edit an existing subcomponent region when you must calibrate for different wall thicknesses.

7. **Discard/Keep**

   Tap to discard invalid data points. Tap again when the cursor is over a discarded point to reactivate it.

8. **Update Scan Zone**

   Tap to save your scan zone to reflect your latest modifications.

9. **Zoom to Content**

   Tap to zoom in on to the acquired data in the C-scan.

10. **Full Extent**

    Tap to see the C-scan of the entire defined scan zone.

11. **Color Palette**

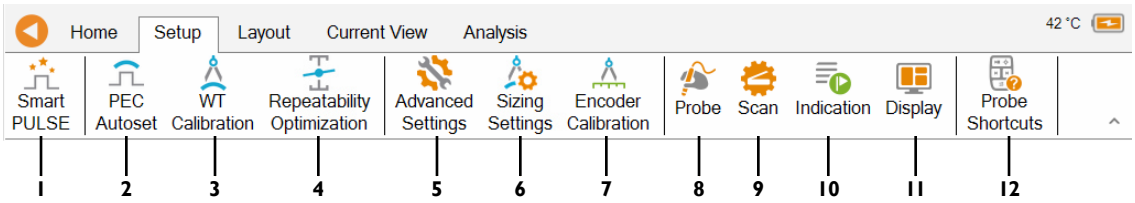
    Tap to open the palette selector to modify the C-scan color palette in use.

12. **Probe Guides**

    Tap to activate the probe guides in the C-scan. The probe guides show the extension of the array probe on the C-scan in dynamic mode. Unused with single-element probes.

Setup Ribbon

Figure 16 Setup ribbon



1. **SmartPULSE**

   Tap to perform a complete system calibration including PEC Autoset, WT Calibration, and Repeatability Optimization.

2. **PEC Autoset**

   Tap to automatically configure Lyft for an optimal PEC signal.

3. **WT Calibration**

   Tap to calibrate Lyft on a nominal wall or other known thickness.

4. **Repeatability Optimization**

   Tap to perform a repeatability optimization, ensuring reliable measurements from Lyft.

5. **Advanced Settings**

   Tap to modify your setup manually.

6. **Encoder Calibration**

   Tap to calibrate the encoder resolution.

7. **Sizing Settings**

   Tap to change the sizing algorithm used in calculating wall thicknesses.

8. **Probe**

   Tap to select a probe and line filter frequency.

9. **Scan**

   Tap to select a scanning pattern and select a grid resolution.

10. **Indication**

    Tap to select and configure the indication codes used in reporting.

11. **Display**

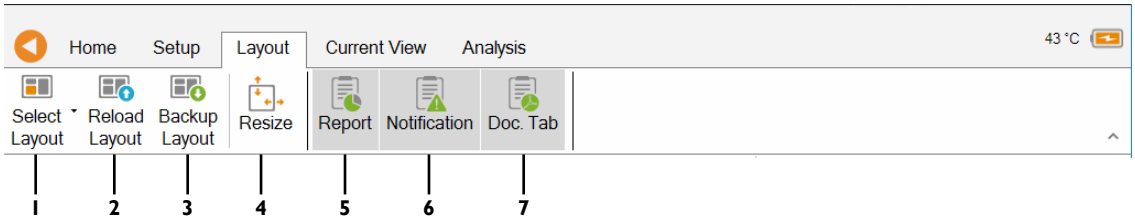
    Tap to configure the layout of the Lyft display front stage.

12. **Probe Shortcuts**

    Tap to display a dialog box describing all the functions that can be activated with combinations of buttons on the probe.

Layout Ribbon

Figure 17 Layout ribbon



1. **Select Layout**

   Tap to select a front stage display layout.

2. **Reload Layout**

   Tap to load a saved display layout.

3. **Backup Layout**

   Tap to save your current display layout configuration.

4. **Locked**

   Tap to unlock the layout and enable easier view resizing.

5. **Report**

   Tap to display or hide the **Report** tab at the bottom of the front stage.

6. **Notification**

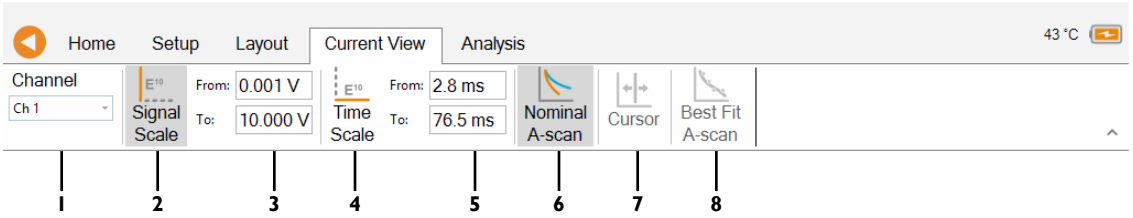
   Tap to display or hide the **Notification** tab at the bottom of the front stage.

7. **Doc. Tab**

   Tap to display or hide the **Documentation** tab at the bottom of the front stage.

Current A-Scan View Ribbon

Figure 18 Current A-scan view ribbon



1. **Channel selection**

   Allows selecting the channel displayed in the A-scan view. (Unavailable with array probes.)

2. **Signal Scale**

   Tap to switch the vertical axis scale between linear and logarithmic.

3. **Vertical axis voltage range**

   Use the text boxes to define the vertical axis voltage range.

4. **Time Scale**

   Tap to switch the horizontal axis scale between linear and logarithmic.

5. **Horizontal axis time range**

   Use the text boxes to define the horizontal axis voltage range.

6. **Nominal A-Scan**

   Tap to display or hide the nominal wall thickness A-scan. (Unavailable with array probes.)

7. **Cursor**

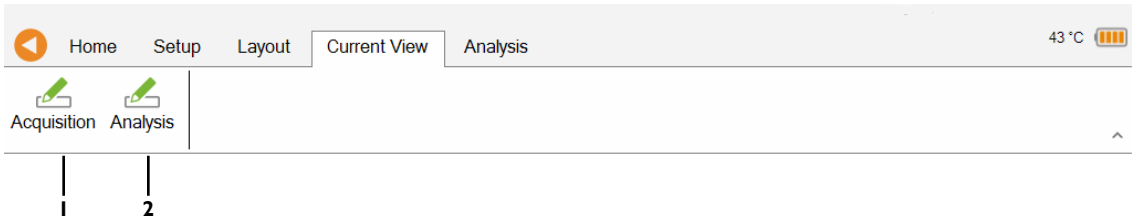
   Tap to display or hide the A-scan cursor. (Unavailable with array probes.)

8. **Best Fit A-scan**

   Tap this button to display the best fit A-scan. (Unavailable for array probes.)

Current Information View Ribbon

Figure 19 Current information view ribbon



1. **Acquisition**

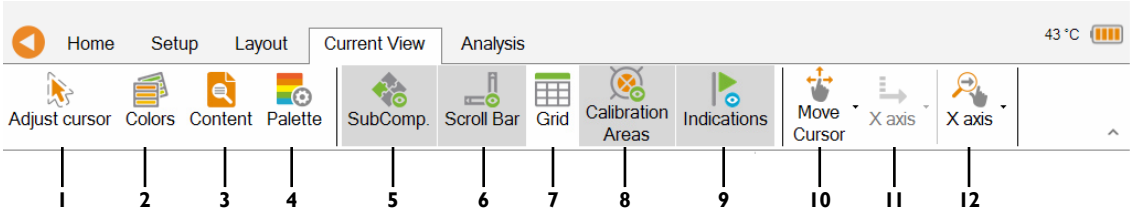
   Tap to select the different information displayed during data acquisition.

2. **Analysis**

   Tap to select the different information displayed during data analysis.

Current C-Scan View Ribbon

Figure 20 Current C-scan view ribbon



1. **Adjust Cursor**

   Tap to resize the cursor.

2. **Colors**

   Tap to edit the C-scan color scheme.

3. **Content**

   Tap to zoom in on to the acquired data in the C-scan.

4. **Palette**

   Tap to open the **Palette Selector** dialog box.

5. **Subcomponent**

   Tap to display or hide the subcomponent regions in the C-scan.

6. **Scroll Bar**

   Tap to display or hide the scroll bars.

7. **Grid**

   Tap to display or hide the C-scan grid overlay. (Only available in grid mode.)

8. **Calibration Point**

   Tap to display or hide the calibration points in the C-scan.

9. **Indications**

   Tap to display or hide indication boxes in C-scans.

10. **Move Cursor**

    Tap to select the Lyft multi-touch display operational mode (moving the cursor, resizing).

11. **Axis selection**

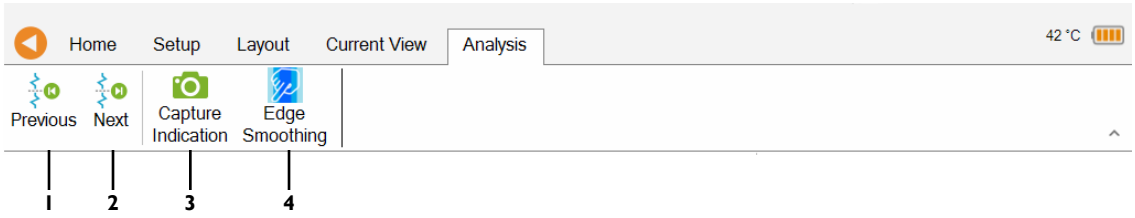
    When the operational mode of the multi-touch display is set to resize, tap to select the axis to resize.

12. **Zoom mode selection**

    Tap to select the axis along which to pinch zoom.

Analysis Ribbon

Figure 21 Analysis Ribbon



1. **Previous**

   Tap to select the previous defect indication recorded in the current C-scan.

2. **Next**

   Tap to select the next defect indication recorded in the current C-scan.

3. **Capture indication**

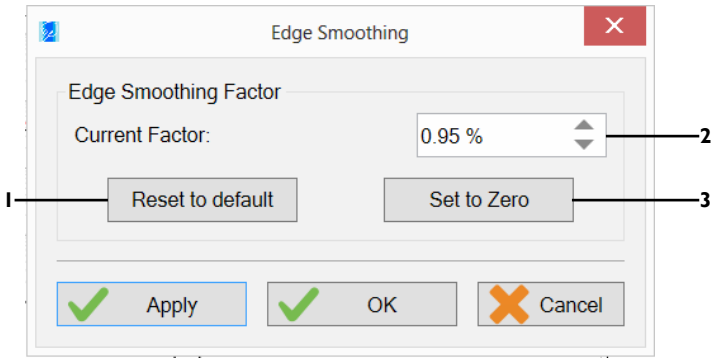
   Tap to capture the next defect indication recorded in the current C-scan. The screen capture is saved in the component folder as if it were created when entering the defect. The screen capture also appears in the Microsoft® Excel® report.

4. **Edge smoothing**

   Tap to set a correction factor used to smooth out small sizing variations that can be observed on elements 1 and 6 on the array C-scan view. Only available with array probes. See the following section for details.

Edge Smoothing Dialog Box

Figure 22 Edge Smoothing dialog box



1. **Reset to default**

   Tap to change the current factor to the default factor calculated for the defined component.

2. **Current factor**

   Currently applied correction factor used to smooth out small sizing variations observed on channels 1 and 6 of the array C-scan.

3. **Set to 0**

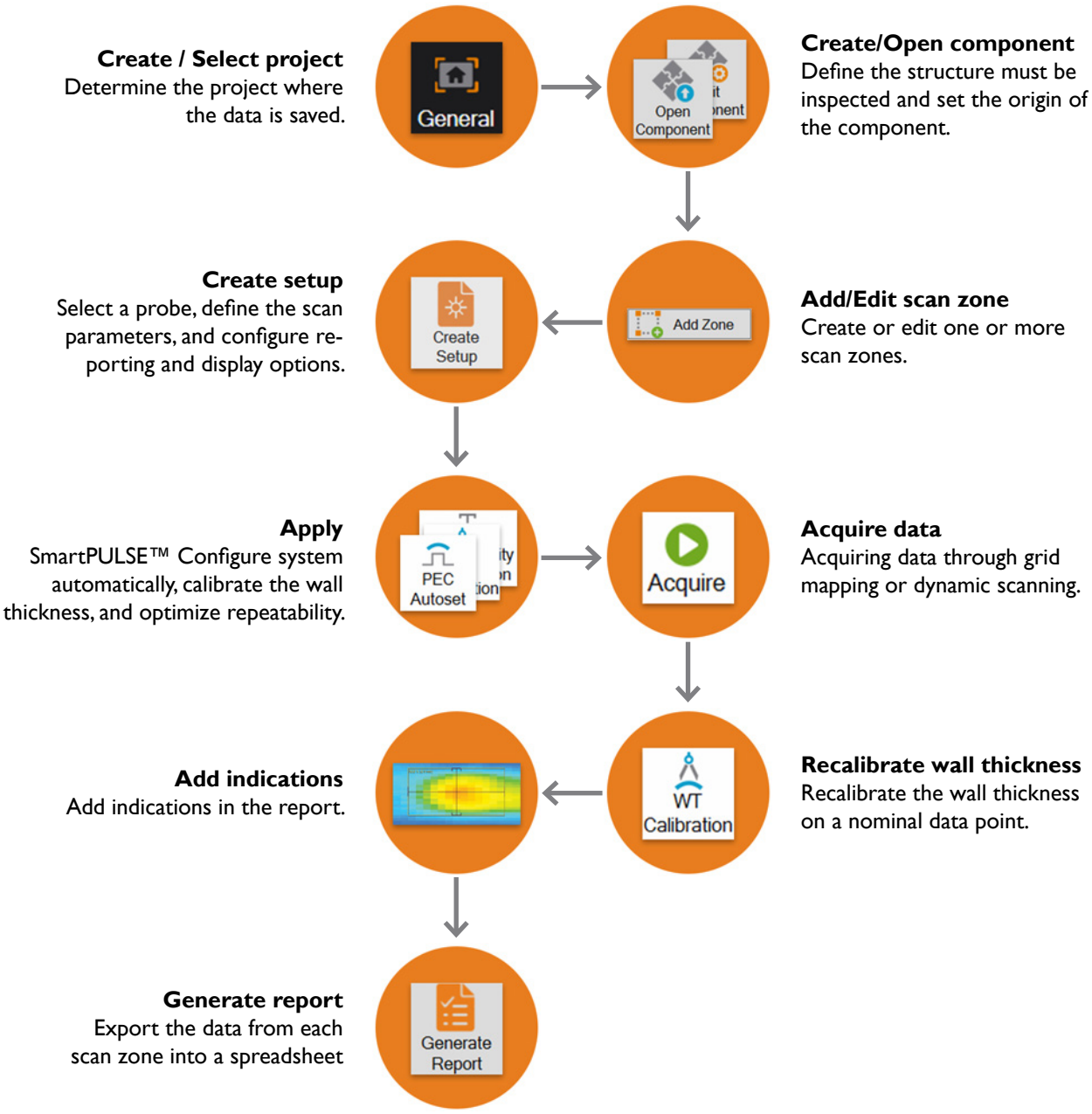
   Tap to change the current factor to 0%.

Chapter 3

Workflow Overview

Typical Inspection Workflow

Figure 23 Typical inspection workflow



Create / Select project
Determine the project where the data is saved.

Create/Open component
Define the structure must be inspected and set the origin of the component.

Create setup
Select a probe, define the scan parameters, and configure reporting and display options.

Add/Edit scan zone
Create or edit one or more scan zones.

Apply
SmartPULSE™ Configure system automatically, calibrate the wall thickness, and optimize repeatability.

Acquire data
Acquiring data through grid mapping or dynamic scanning.

Add indications
Add indications in the report.

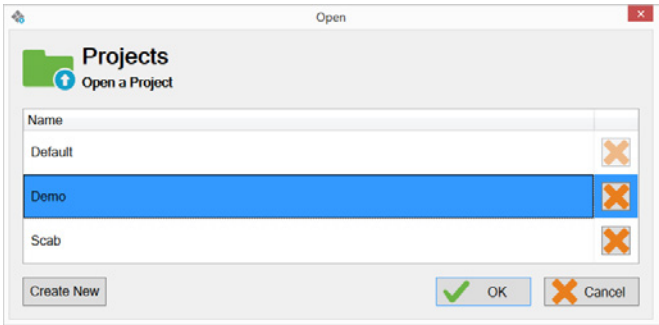
Recalibrate wall thickness
Recalibrate the wall thickness on a nominal data point.

Generate report
Export the data from each scan zone into a spreadsheet

Creating/Selecting a Project

1. In the **General** section of the backstage view, tap.
   The **Open** dialog box opens.

Figure 24 **Open** dialog box



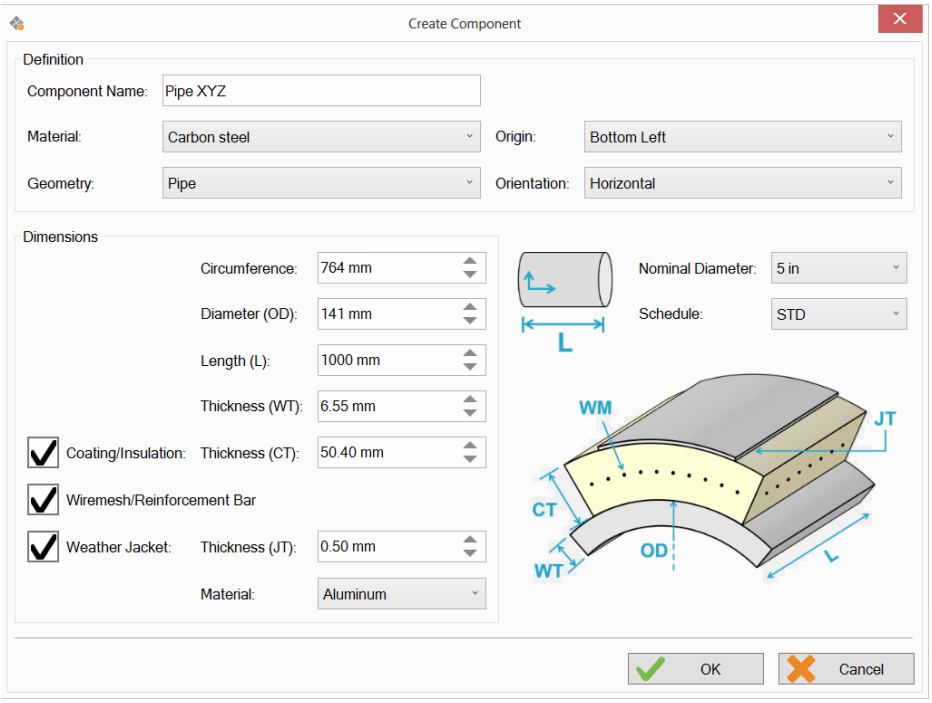
2. Tap an existing project in the project list or tap **Create New** to create a new inspection project.

Creating/Opening a Component

Creating a Component

1. In the **General** section of the backstage, tap **Create Component**.
   The **Create Component Inspection** dialog box opens.

Figure 25 **Create Component** dialog box

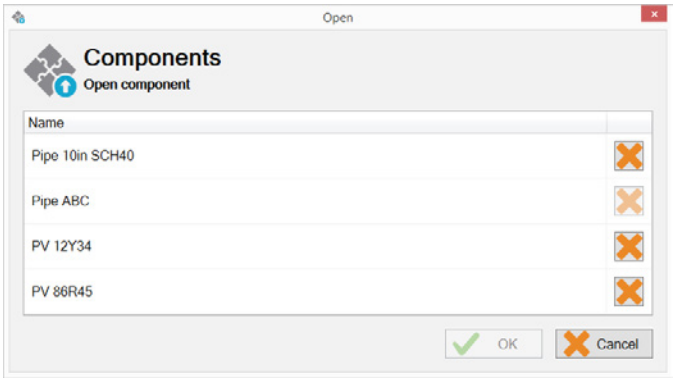


2. Specify all the necessary information, and then tap **OK**.

Opening an Existing Component

1. In the **General** section of the backstage, tap **Open Component**.
   The **Open** dialog box opens.

Figure 26 **Open** dialog box

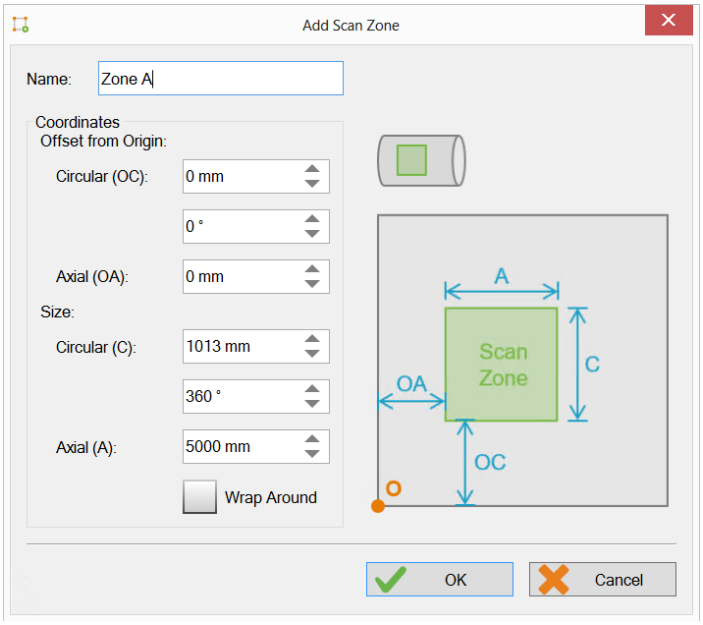


2. Tap an existing component in the list, and then tap **OK**.

Adding/Editing a Scan Zone

1. In the **Scan Area** section of the backstage, tap **Add Zone**.
   The **Add Scan Zone** dialog box opens.

Figure 27 **Add Scan Zone** dialog box



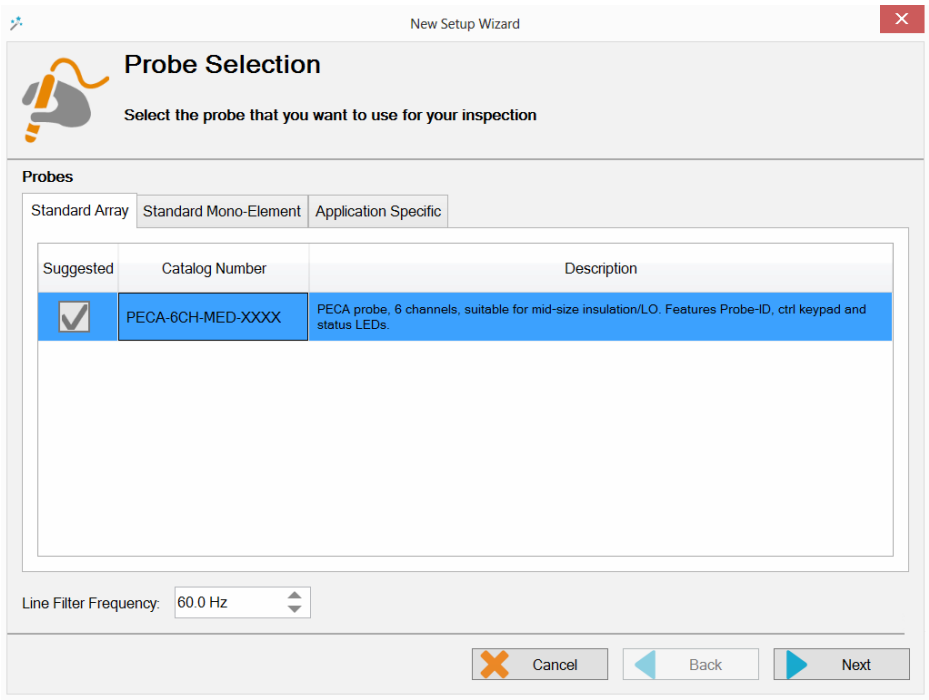
2. Specify all the necessary information, and then tap **OK**.

Creating a Setup

1. In the **Scan Area** of the backstage, tap **Create Setup**.

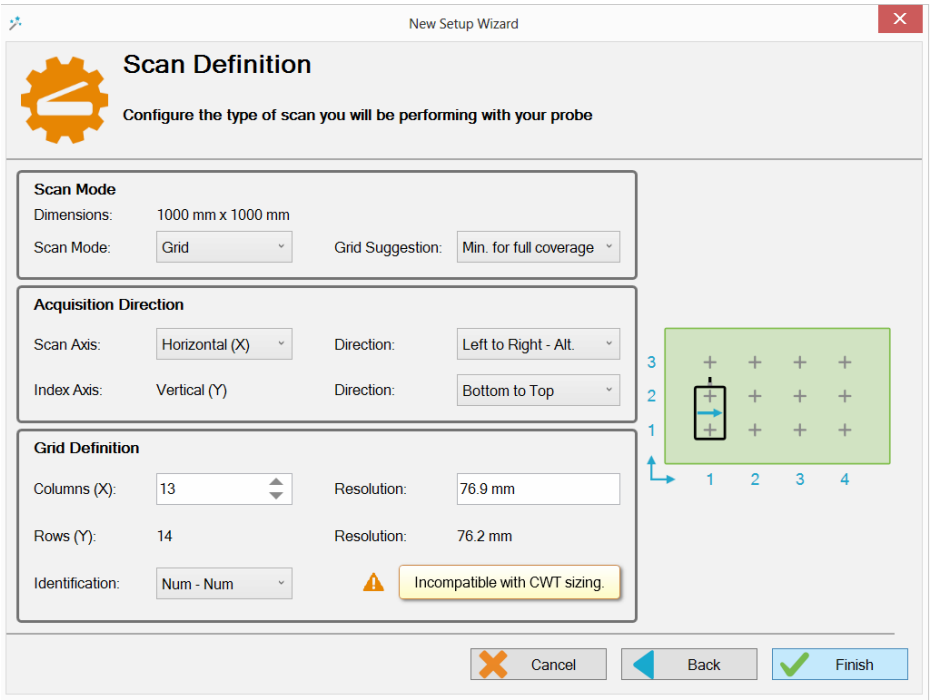
   The **New Setup Wizard** dialog box opens. The probe highlighted in blue is the probe currently connected to Lyft, if any. The recommended probe is indicated in the **Suggested** column.

Figure 28 Probe selection



2. Connect the recommended probe to Lyft, as necessary.
3. Configure the **Line Filter Frequency** to the frequency of the power outlet.
4. Tap **Next**.

Figure 29 Scan definition



5. On the **Scan Mode** list, select your scan mode.

   Note

   There are six available scan modes:

   Grid mode:

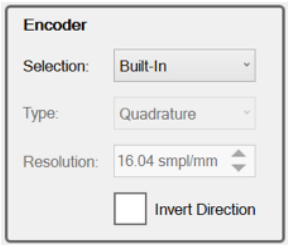
   - Min. for full coverage: the resolution is set at the coarsest value while still ensuring full coverage.
   - CWT ready: the resolution is set to allow CWT calculations.
   - Manual: resolution is set manually.

   Dynamic mode:

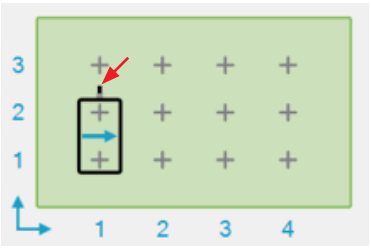
   - High resolution: a high-resolution grid is proposed, based on the component geometry and probe footprint.
   - CWT ready: the resolution is set to allow CWT calculations.
   - Manual: resolution is set manually.

   Notes

   - In dynamic mode, it is possible to configure an external encoder or invert the direction of the embedded encoder.

   - With array probes, the positioning image on the right shows the orientation of the array in relation to the scanning grid. Element 1 is near the probe cable, which is represented by the short black line on the side of the probe (see below). The probe moves in the direction of the blue arrow.

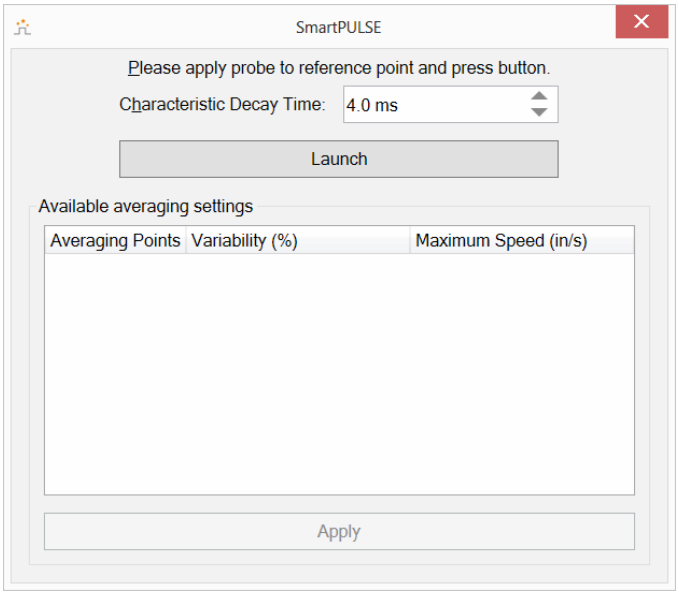
6. Tap **Finish**.

Applying SmartPULSE

Quick Procedure

1. In the front stage, on the **Home** or **Setup** ribbon, tap **SmartPULSE**.

Figure 30 SmartPULSE dialog box



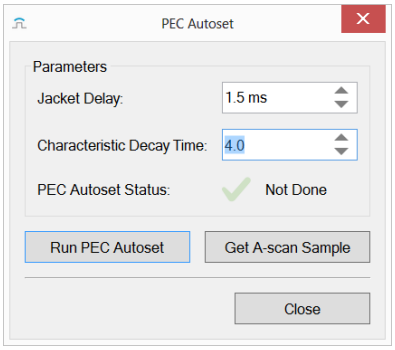
2. Place your probe on the nominal area of the component under test.
3. In the **SmartPULSE** dialog box, tap **Launch**.
4. At the end of the routine, in the **Available averaging settings** list, tap the appropriate point to reach the desired repeatability.
5. Tap **Apply**.

Detailed Procedure

1. In the front stage, on the **Setup** ribbon, tap **PEC Autoset**.

   The **PEC Autoset** dialog box opens. The **Jacket Delay** and **Characteristic Decay Time** values are configured according to your component configuration.

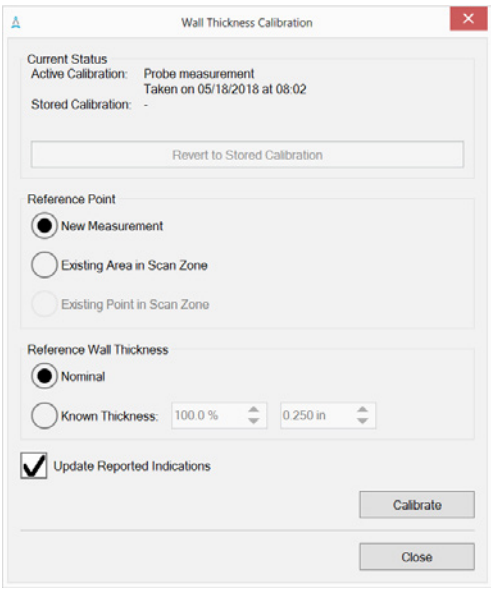
Figure 31 PEC Autoset dialog box



2. Place your probe on the nominal area of your component.
3. Tap **Run PEC Autoset**.
4. To see the signal from your probe, tap **Get A-Scan Sample**.
5. While the probe is still on the nominal area of your component, in the front stage, on the **Setup** ribbon, tap **WT Calibration**.

   The **Wall Thickness Calibration** dialog box appears.

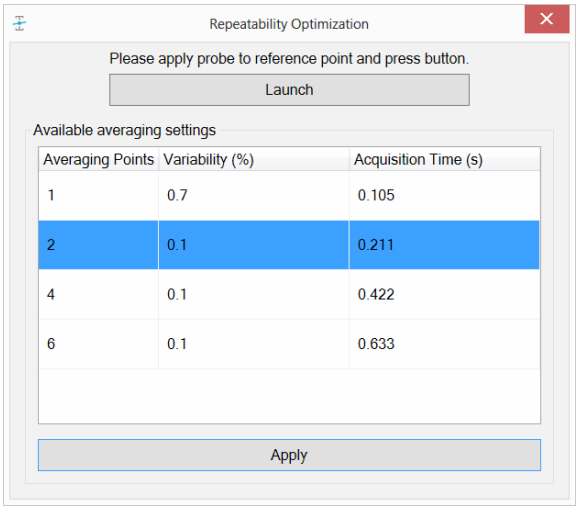
Figure 32 Wall Thickness Calibration dialog box



6. Select **New Measurement**.
7. Select **Nominal**.
8. Tap **Calibrate**.
9. While the probe is still on the nominal area of your component, in the front stage, on the **Setup** ribbon, tap **Repeatability Optimization**.

   The **Repeatability Optimization** dialog box opens.

Figure 33 Repeatability Optimization dialog box



10. Tap **Launch**.
11. In the **Available averaging settings** box, tap the appropriate point to reach the desired repeatability, and then tap **Apply**.

Acquiring Data

Acquiring Data in Grid Mode

1. Start a data acquisition any of the following three ways:
   - Tap **Acquire** on the **Home** ribbon of the front stage view.
   - On Lyft, press  .
   - On the probe, press  .
2. Place your probe at the coordinates indicated in the information view of the front stage.
3. Measure a point any of the following three ways:
   - Tap **Get Point** on the **Home** ribbon of the front stage view.
   - On Lyft, press  .
   - On the probe, press  .
4. To move to the following index:
   - On Lyft, press  or
   - on the probe, press  .
5. Stop acquisition any of the following three ways:
   - Tap the **Stop** button on the **Home** ribbon of the front stage view.
   - On Lyft, press  .
   - On the probe, simultaneously press  and  .

Acquiring Data in Dynamic Mode

1. Start a data acquisition any of the following three ways:
   - Tap **Acquire** on the **Home** ribbon of the front stage view.
   - On Lyft, press  .
   - On the probe, press  .
2. Move your probe along the scan axis.
3. To move to the following index:
   - On Lyft, press  or
   - on the probe, press  .
4. Stop your data acquisition any of the following three ways:
   - Tap the **Stop** button on the **Home** ribbon of the front stage view.
   - On Lyft, press  .
   - On the probe, simultaneously press  and  .
5. To temporarily pause data acquisition:
   - On the **Home** ribbon, tap **Pause Encoder**.
   - Tap again to resume acquiring data.
   - To pause acquisition, on the probe, press  .
   - Press it again to resume acquisition.

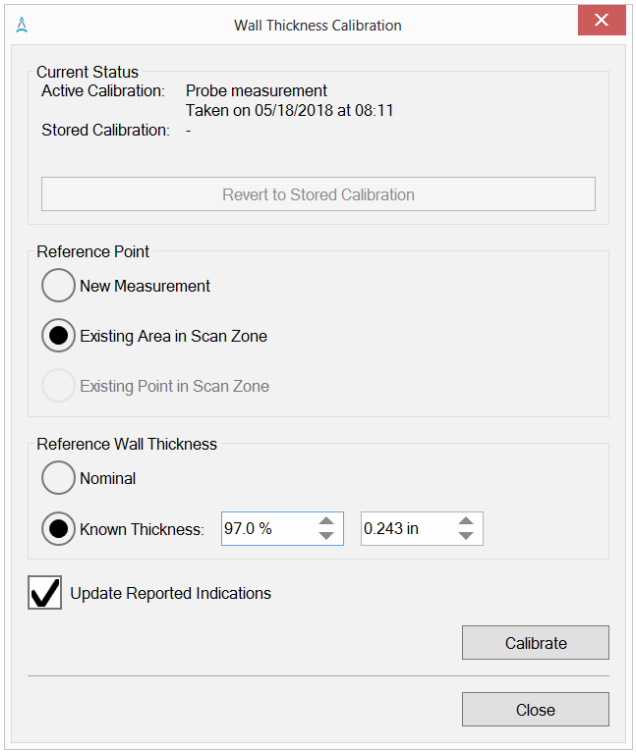
Recalibrating the Wall Thickness

If the initial calibration point does not correspond to the nominal value, the C-scan can be recalibrated on a different acquired point.

1. While the cursor is on the nominal area of your component, in the front stage, on the **Setup** ribbon, tap **WT Calibration**.

   The **Wall Thickness Calibration** dialog box opens.

Figure 34 Wall Thickness Calibration dialog box

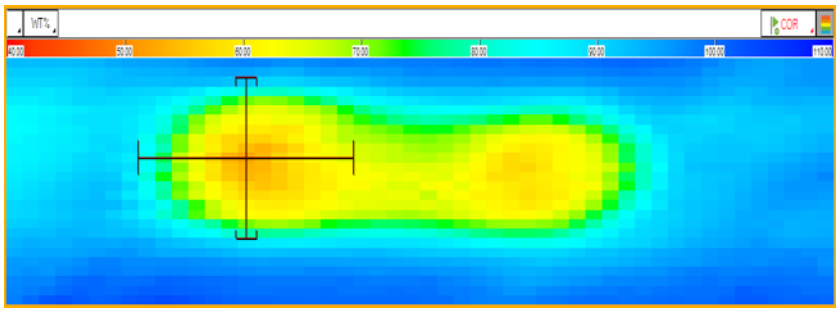


2. In the **Reference Point** group, select **Existing Area in Scan Zone** or **Existing Point in Scan Zone** (only available for single-element probes).
   - To ensure good calibration on data acquired with an array probe, the minimum calibration area size is five points on the index axis and three points on the scan axis.
3. In the **Reference Wall Thickness** group, select **Nominal** to calibrate at 100% of the wall thickness or **Known Thickness** to calibrate at a different thickness.
4. Tap **Calibrate**.

Adding Indications to a Report

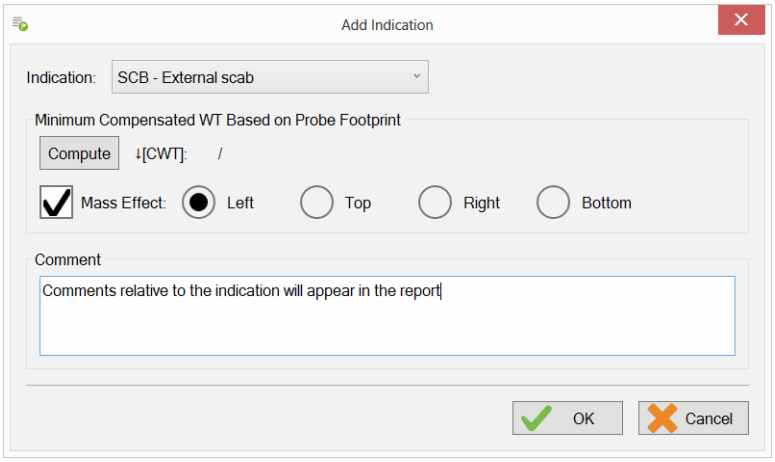
1. If there are any, discard invalid data points near the defect you want to add.
2. Move the cursor over the target defect.

Figure 35 Placing cursor over target defect



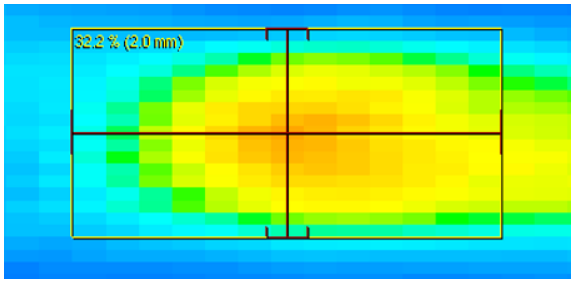
3. Resize the cursor's crosshairs so that it covers the entire defect.
4. Tap **Add Indication**.
   The **Add indication** dialog box appears.

Figure 36 **Add indication** dialog box



5. On the **Indication** list, select the type of corrosion.
6. To compute the compensated wall thickness, when available, tap **Compute**.
   - If the defect is close to a feature that could affect sizing, a flange, for example, select the **Mass Effect** check box, and then select the direction where the feature is located.
7. If necessary, add a comment.
8. Tap **OK**.
   The defect boundaries and compensated wall thickness appear on the C-scan.

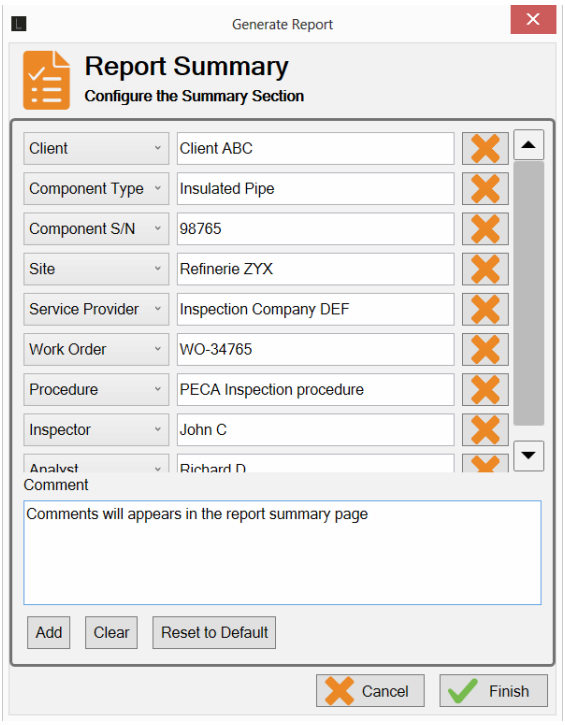
Figure 37 Indication added



Generating a Report

1. In the **General** section of the backstage, tap **Generate Report**.
   The **Generate Report** dialog box appears.

Figure 38 Generate Report dialog box



2. Type in any missing information and add comments if necessary.
3. Tap **Finish**.

Managing Data

Quick Copy

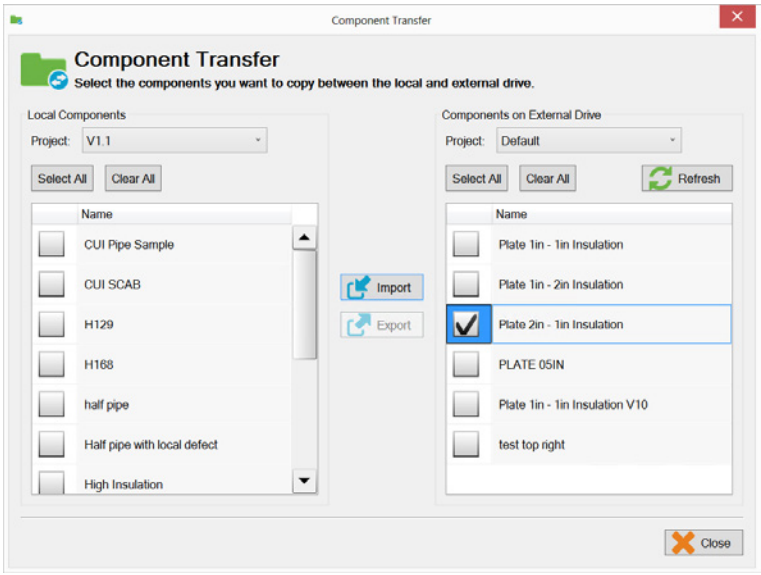
1. Connect a USB mass storage device (MSD) to the QUICK COPY port on the left-hand side of the instrument.
2. Press the QUICK COPY button.
   - All the folders in the **Projects** folder of the Lyft instrument are copied to the USB MSD.
   - All the files in the **UserData** folder on the USB MSD are copied to the Lyft instrument.

Transferring Components

Use this procedure to import data from a USB MSD or export data to it. The procedure illustrates how to import data.

1. Connect a USB MSD containing a component to a USB port on the left-hand side of the instrument.
2. In the backstage, in the **General** section, tap **Component Transfer**.
   The **Component Transfer** dialog box appears.

Figure 39 Component Transfer dialog box



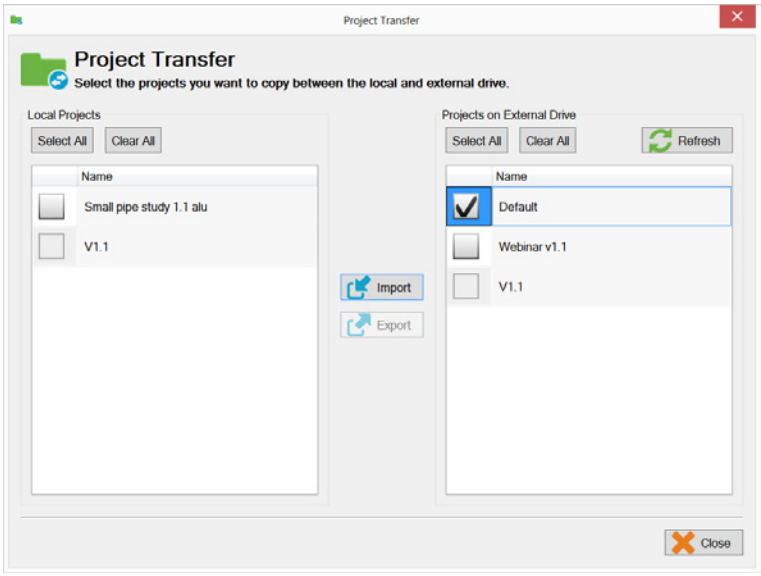
3. In the **Components on External Drive** group, select the components that you want to import to Lyft.
4. In the **Local Components** group, select the project where you want the component to be transferred.
5. Tap **Import**.

Transferring Projects

This procedure can be used to import data from a USB MSD or export data to it. The following procedure illustrates how to import data.

1. Connect a USB MSD containing a project to a USB port on the left-hand side of the instrument.
2. In the backstage, in the **General** section, tap **Project Transfer**.
   The **Project Transfer** dialog box appears.

Figure 40 Project Transfer dialog box



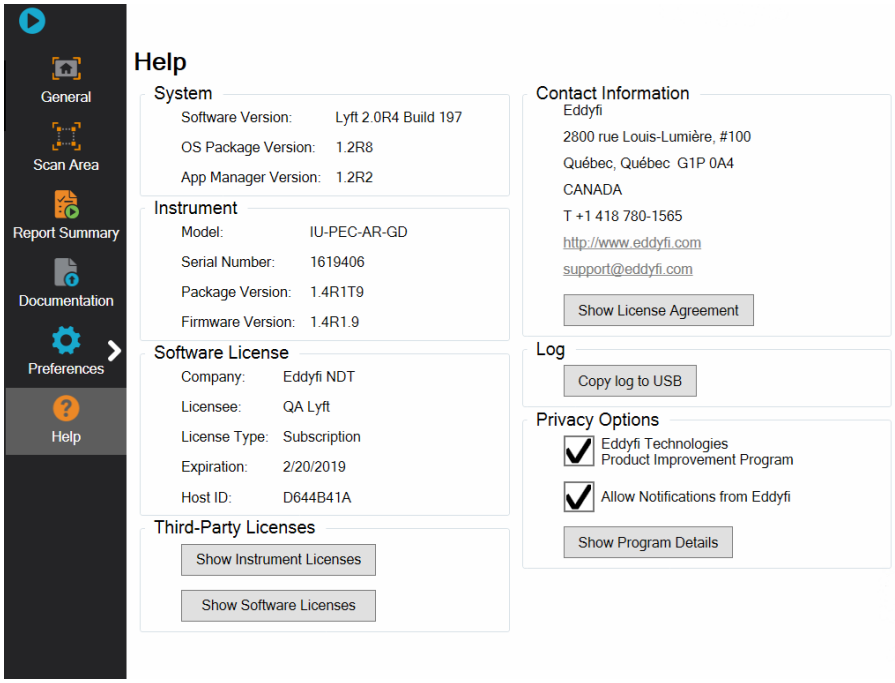
3. In the **Projects on External Drive** group, select the projects that you want to import to Lyft.
4. Tap **Import**.

Deleting All User Data

To delete all the user data on Lyft, proceed as follows:

1. Connect a USB keyboard to one of the Lyft USB ports.
2. In the backstage, tap **Help**.

Figure 41 **Help** section



3. Tap or click inside the **Help** section.
4. On the keyboard, press ALT+F2.
   A confirmation dialog box appears.
5. Follow the instructions on your screen to complete the operation.
   All the user data is removed from the instrument.

Enabling and Disabling the Multi-Touch Display

Proceed as follows to disable and then re-enable the multi-touch display. You can perform this procedure with a USB keyboard connected to Lyft or with the keypad.

Enabling the Multi-Touch Display

1. On the Lyft keypad, long-press  .
   Alternatively, you can long-press K on your keyboard. A dialog box appears prompting you to confirm whether you want to enable the multi-touch display. The display responds to touches and keyboard actions.

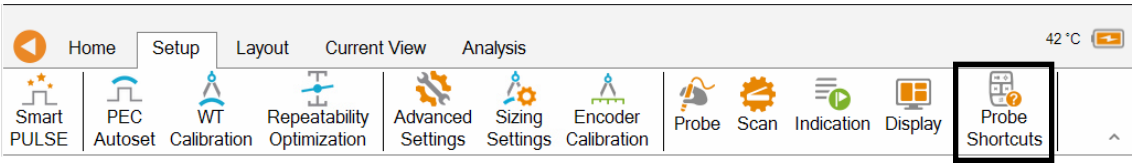
Disabling the Multi-Touch Display

1. On the Lyft keypad, long-press  .
   Alternatively, you can long-press K on your keyboard. A dialog box appears prompting you to confirm whether you want to disable the multi-touch display. The display no longer responds to taps or keyboard actions until it is re-enabled.

Remote Control Reference

A number of operations can be performed using the remote controls on PEC probes. The following summarizes all the possible functions. You can display the probe shortcuts by tapping **Probe Shortcuts** on the **Setup** tab.

Figure 42 **Setup** tab



Analysis Mode

Table 4 Analysis mode remote control reference

Keypad Function	Operation
▶I	Moves to the next point on the scan axis.
I◀	Moves to the previous point on the scan axis.
⇉	Moves to the next point on the index axis.
I◀ + ▶I	Moves to the previous point on the index axis.
▶■⌖	Initiates the acquisition in analysis mode.
I◀ + ▶■⌖	Initiates the survey mode.
▶I + ▶■⌖	Opens the **SmartPULSE** dialog box.
⇉ + ▶■⌖	Opens the **PEC Autoset** dialog box in analysis mode.
⇉ + I◀	Opens the **WT Calibration** dialog box in analysis mode.
⇉ + ▶I	Opens the **Repeatability Optimization** dialog box in analysis mode.

Grid Mapping Data Acquisition

Table 5 Grid mapping data acquisition remote control reference

Keypad Function	Operation
▶■⌖	Acquires a data point at the current cursor location.
▶I	Moves to the next acquisition point as defined in the scan parameters on the scan axis (may not be the same direction as the movement of the probe).
I◀	Moves to the next acquisition point as defined in the scan parameters on the scan axis (may not be the same direction as the movement of the probe).
⇉	Moves to the next acquisition point as defined in the scan parameters on the scan axis (may not be the same direction as the movement of the probe).
I◀ + ▶I	Moves to the next acquisition point as defined in the scan parameters on the scan axis (may not be the same direction as the movement of the probe).
I◀ + ▶■⌖	Reverses the direction of the grid mapping data acquisition.
⇉ + ▶■⌖	Stops the acquisition mode. Returns to the analysis mode.

Dynamic Mode Data Acquisition

Table 6 Dynamic mode data acquisition remote control reference

Keypad Function	Operation
	Pause (first press) and resume (second press) the acquisition process.
	Moves to the previous acquisition point as defined in the scan parameters on the index axis (may not be the same direction as the movement of the probe).
	Moves to the previous acquisition point as defined in the scan parameters on the index axis (may not be the same direction as the movement of the probe).
	Stops the acquisition mode. Returns to the analysis mode.

SmartPULSE

Table 7 SmartPULSE remote control reference

Keypad Function	Operation
	Starts SmartPULSE.
	Aborts SmartPULSE.
	Moves up or down in the table to select the appropriate averaging value.
	Applies the selected averaging value and closes the **SmartPULSE** dialog box.
	Closes the **SmartPULSE** dialog box without selecting the averaging value.

Survey Mode

Table 8 Survey mode remote control reference

Keypad Function	Operation
	Acquires a data point to memory showing results in the A-scan and information zone only
	Stops the survey mode.

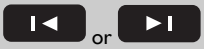
PEC Autoset

Table 9 PEC Autoset remote control reference

Keypad Function	Operation
	Starts the PEC Autoset routine.
	Aborts the PEC Autoset routine.
	Acquires an A-scan sample.
	Closes the **PEC Autoset** dialog box. Returns to the analysis mode.

Wall Thickness Calibration

Table 10 Wall thickness calibration remote control reference

Keypad Function	Operation
	Starts the wall thickness calibration with a new measurement (default setting).
	Starts a wall thickness calibration with the currently selected area..
	Moves to the next point on the scan axis.
	Moves to the previous point on the scan axis.
	Moves to the next point on the index axis.
	Moves to the previous point on the index axis.
	Aborts the wall thickness calibration process.
	Closes the **WT Calibration** dialog box. Returns to the analysis mode.

Repeatability Optimization

Table 11 Repeatability optimization remote control reference

Keypad Function	Operation
	Starts the repeatability optimization process.
	Aborts the repeatability optimization process.
	Moves up or down in the table to select the appropriate averaging value.
	Applies the selected averaging value and closes the **Repeatability Optimization** dialog box.
	Closes the **Repeatability Optimization** dialog box without selecting a new averaging value. Returns to the analysis mode.

Chapter 4

Lyft Pro Software

Lyft Pro

Lyft Pro enables advanced Lyft data analysis and features the same graphical user interface as the Lyft embedded software. Lyft Pro takes advantage of the power of a workstation and offers features like wireless transfer, calibration propagation, and compensated wall thickness C-scans.

Transfer Data from Lyft to a Computer

The data captured with Lyft can be transferred to Lyft Pro running on your computer any of the following ways:

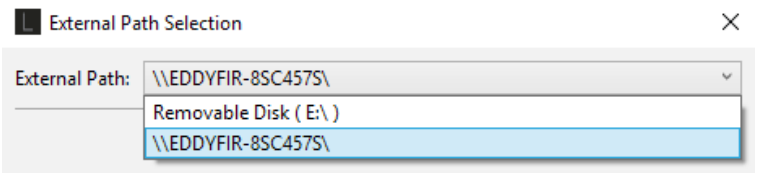
- With a USB mass storage device, as explained in *Managing Data* on page 38.
- Through a wireless connection between Lyft Pro and the instrument.
- Through an Ethernet connection between Lyft Pro and the instrument.

For the second method to work, you must activate the Lyft Wi-Fi. The computer running Lyft Pro and the Lyft instrument must be connected to the same wireless network.

Importing Data from Lyft Pro Over a Wireless Network

1. Start Lyft Pro.
2. On the backstage, tap **General**.
3. Tap **Component Transfer** or **Project Transfer** (see *Managing Data* on page 38).
   When Lyft Pro detects Lyft on the wireless network, the following dialog box appears.

Figure 43 **External Path Selection** dialog box



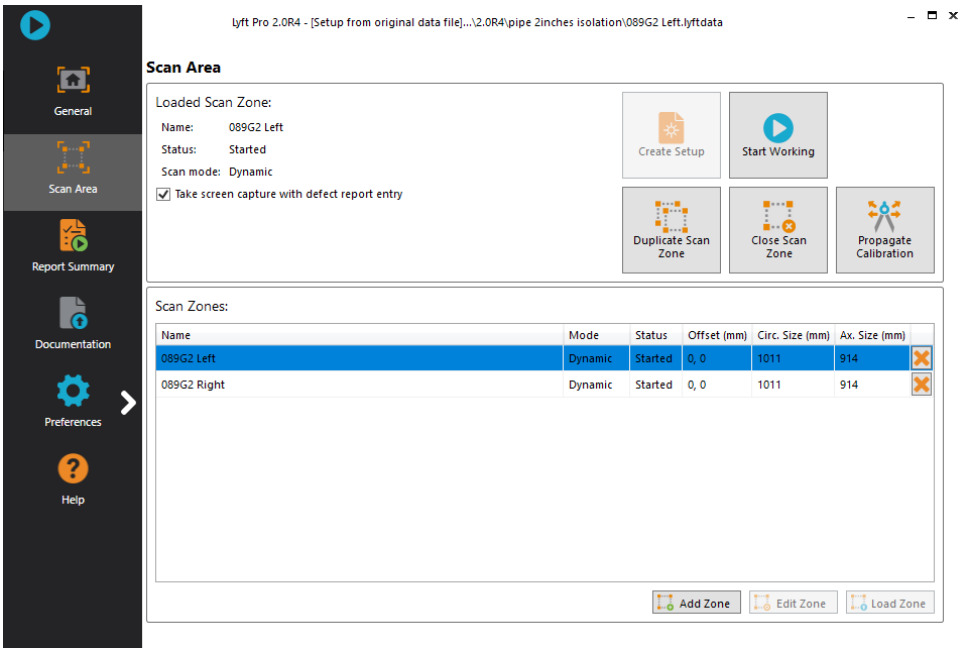
4. On the **External Path** list, select your instrument.
   Click **Refresh** to update the list of available instruments.
5. Click **OK**.
   The **Project Transfer** or the **Component Transfer** window appears. Transfer data as outlined in *Managing Data* on page 38.

Propagating Calibrations with Lyft Pro

Use the Lyft Pro propagate calibration feature to apply one scan zone calibration to other scan zones, created with **Duplicate Scan Zone** (see *Scan Area Section* on page 15).

1. In the **Scan Area** section of the backstage, select and load a scan zone with the calibration you want to apply to other scan zones of the same component. Click **Propagate Calibration**.

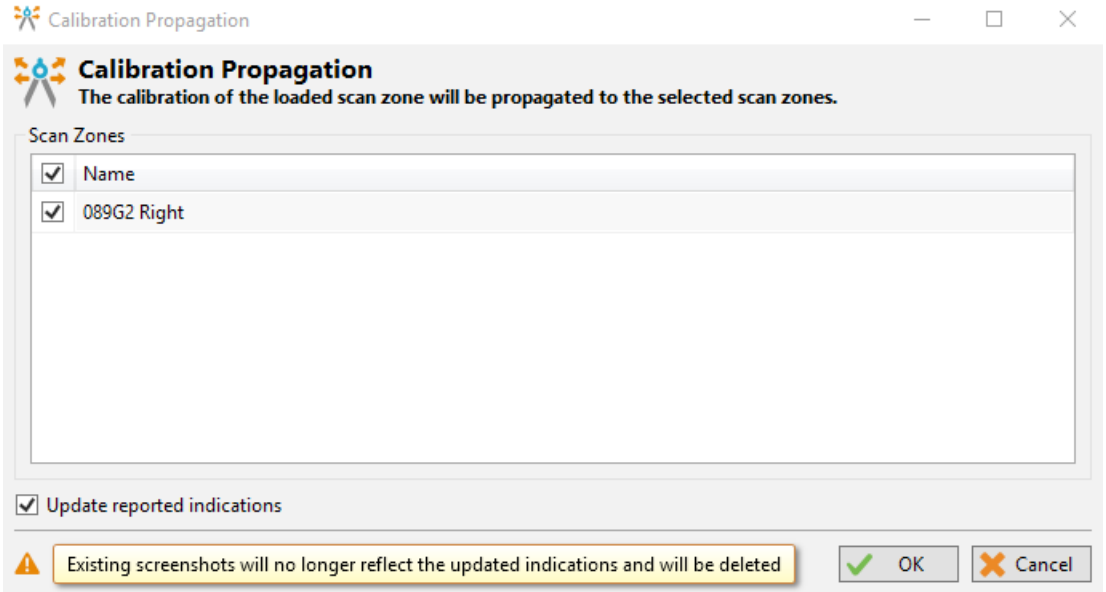
Figure 44 Scan Area section



The **Calibration Propagation** dialog box appears.

2. Select the target scan zones.

Figure 45 Calibration Propagation dialog box



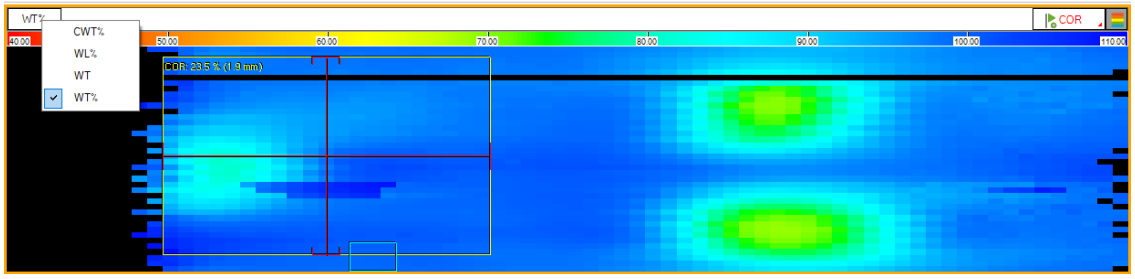
3. When the **Update reported indications** check box is selected, compensated wall thickness values are recalculated based on the new calibration.
4. To start the process, click **OK**.

Compensated Wall Thickness C-scan

In Lyft and in Lyft Pro, C-scans show several different values (click the button in the upper-left corner of the C-scan to select the desired output).

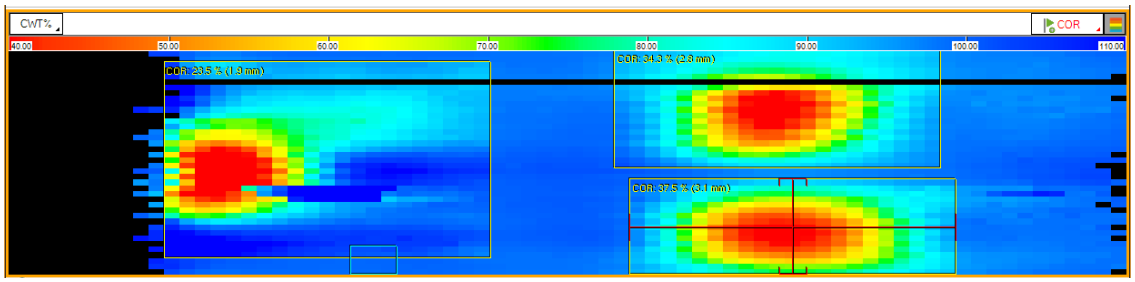
- WT%: remaining wall thickness in % relative to the nominal wall thickness
- WT: remaining wall thickness in absolute units
- WL%: wall loss in % relative to the nominal wall thickness
- CWT% (only available in Lyft Pro): compensated remaining wall thickness in % relative to the nominal wall thickness

Figure 46 Selecting an output in a C-scan



A CWT% C-scan is processed with colors adjusted to the minimum remaining wall thickness of a defect to the value from the CWT tool. For example, the CWT value of the above defect is 45.5%, while the C-scan shows greenish colors corresponding to about 85%. The CWT% C-scan displays the defect's minimum wall thickness in reddish colors more representative of the actual remaining wall thickness (with the standard palette). The CWT% C-scan looks like so:

Figure 47 CWT% C-scan



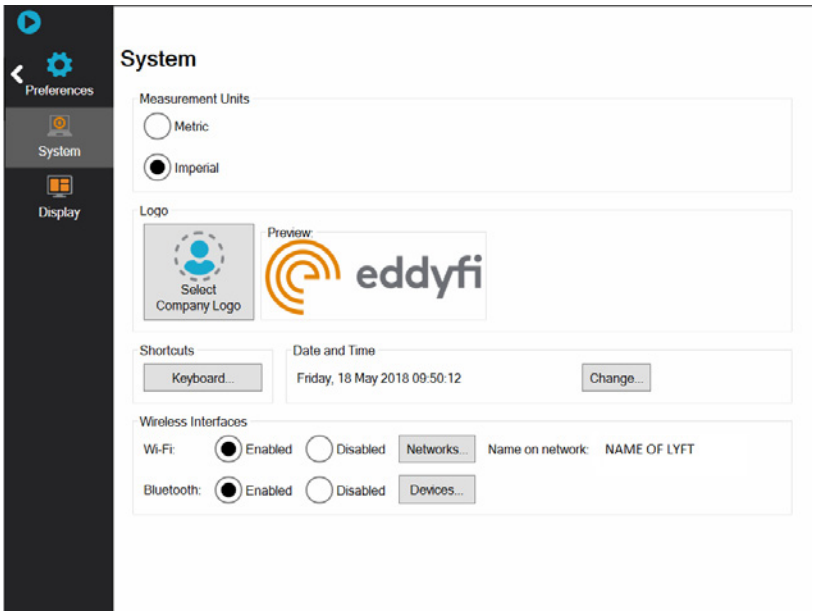
The CWT% C-scan is included in the Microsoft Excel report generated with Lyft Pro (see *Generating a Report* on page 38).

Chapter 5

Preferences

Managing Preferences

Figure 48 System preferences



Measurement Units

You can use Lyft under the US Customary (imperial) or metric system of measurement units. To change measurement unit system, tap **Imperial** or **Metric**. When you do, measurement units are adjusted across the software and in your reports.

Company Logo

1. See *Managing Data* on page 38 to find out how to import your logo to the Lyft instrument.
2. Tap **Select Company Logo**.
3. Select the logo file, and then tap **OK**.

Figure 49 Selecting a logo

Adjusting the Date and Time of the Lyft Instrument

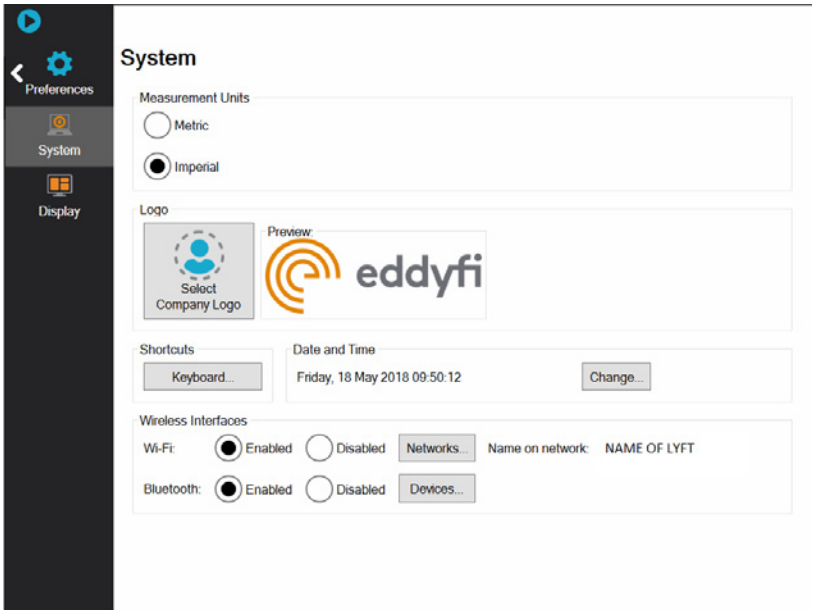
1. In the **System** preference section of the backstage, tap **Change.**
   A dialog box appears where you can adjust the date, time, and time zone to match requirements.

Connecting your Lyft Instrument to a Wireless Network

1. In the **System** preference section of the backstage, tap **Networks**.
   A dialog box showing all available wireless networks appears.

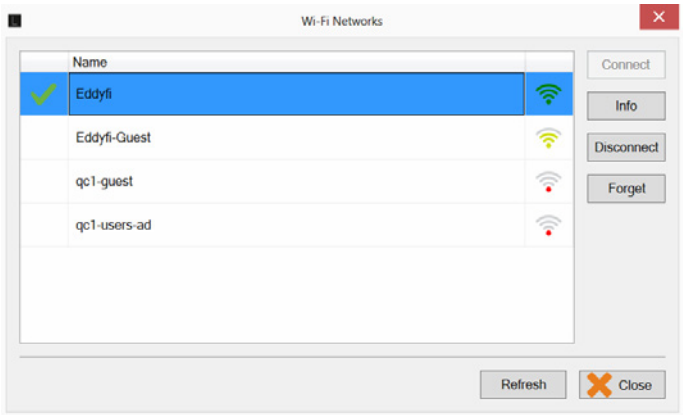
   Note
   As of writing, Bluetooth is still unavailable, but will be in future versions.

Figure 50 **System** preferences



2. Tap the desired network.
3. Tap **Connect**.
4. Input the appropriate user name and password, and then tap **OK**.

Figure 51 **Wi-Fi Networks** dialog box



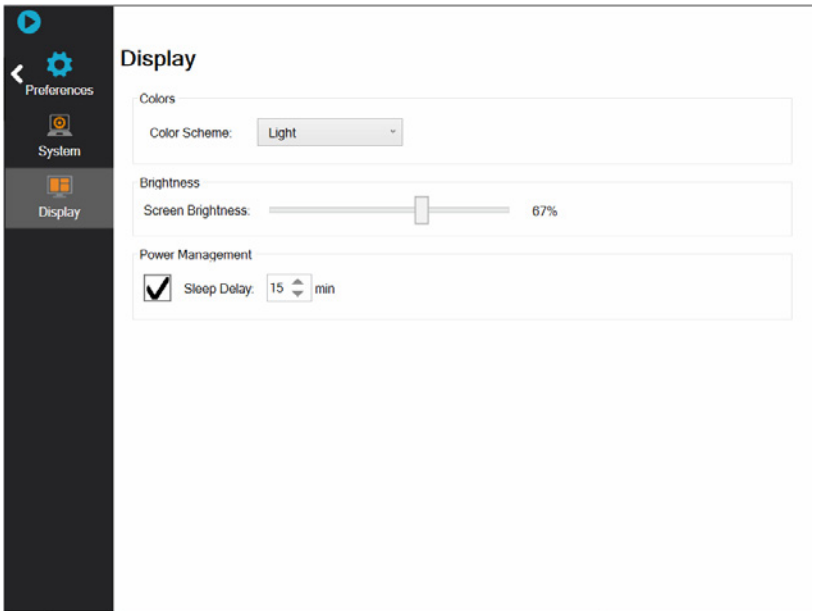
Note

Tap **Disconnect** to break the connection to the wireless network. Tap **Forget** to remove the login information of the selected wireless network.

Display Preferences

In the **Display** preferences section of the backstage, you can configure a sleep delay of 1 to 30 minutes. By default, the sleep delay is 15 minutes. If active, once this delay expires, the display turns off and the power LED goes from green to red.

Figure 52 **Display** preferences



To exit, short press the power button, touch the display, or press any keypad button.

Chapter 6

Keypad and Keyboard Functions

Keyboard Shortcut Keys

The following table lists all the keyboard shortcuts for Lyft. When you are using a physical keyboard with the instrument, you can achieve the same results than with Lyft with these keyboards shortcuts.

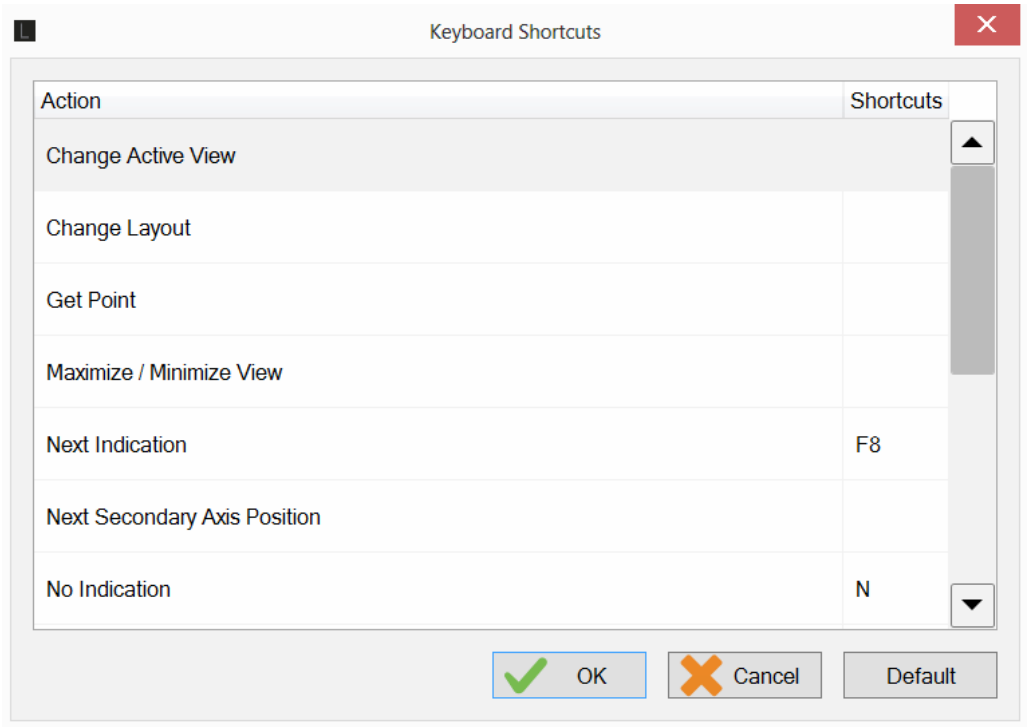
Table 12 Keyboard shortcut

Lyft Function	Keyboard Shortcut
Left arrow	Left arrow
Up arrow	Up arrow
Right arrow	Right arrow
Down arrow	Down arrow
Start/Stop acquisition	F2
Keypad arrow mode selection	F3
Change active view	ALT+F7
Maximize/Minimize view	ALT+F8
Quick Copy	ALT+F9
Exit Lyft software	ALT+F10
Wall thickness calibration	ALT+F11
Change layout	F11
Enter	Enter

Modifying Keyboard Shortcuts

In the **System** preferences of the backstage, tap **Keyboard**.

Figure 53 **Keyboard Shortcuts** dialog box



Chapter 7

Maintenance and Troubleshooting

Maintaining Lyft

Because of its design, Lyft only requires minimal maintenance. Since it has no moving parts, it also does not require any preventive maintenance on your part. We recommend a regular inspection of the instrument to ensure it is properly grounded. We also strongly recommend an annual calibration and a factory-performed preventive maintenance by an officially qualified Eddyfi technician.

Cleaning Lyft

1. Make sure that the instrument is off and that the power cord is disconnected.
2. To bring the instrument back to its original finish, clean it with a soft cloth.

Warning

Do not spray the instrument with chemical cleansers or water. Doing so may lead to short circuits and damage to the instrument.

Important

To remove stubborn stains, use a cloth moistened with soft, soapy solution. Do not use abrasives or strong solvents as they could damage the finish. Wait until the instrument is completely dry before connecting the power cord or cables.

Clip-On Encoder

You should take the following precautions when using the clip-on encoder:

- Completely insert the encoder until you feel it click into place.
- Keep electrical contacts clean of dirt and dust.
- Avoid direct impacts on the encoder arm.

The clip-on encoder is designed to resist 1 m (3.3 ft) drops, even attached to a probe. In the case of a drop or shock, the encoder is designed to detach from the plastic body to avoid permanent failures. The arm is attached to the body with a small clamp ring. A set of five replacement clamp rings and one plier tool are included with Lyft.

Replacing the Clamp Ring

Following an impact on the encoder, the clamp ring on the encoder arm shaft may fall or be damaged. Follow this procedure to replace the clamp ring with a replacement one provided with the instrument.

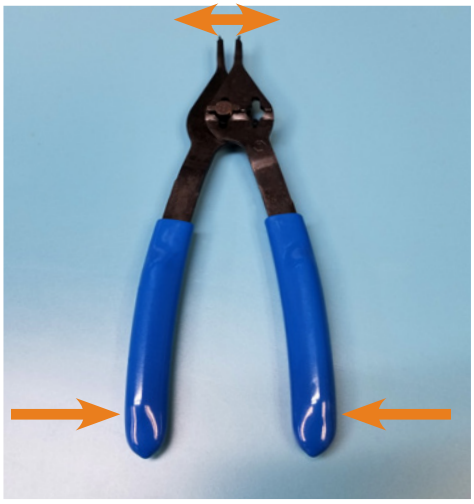
1. Gather the following material:
   - Damaged encoder
   - One replacement clamp ring
   - Supplied pliers

Figure 54 Encoder and replacement clamp ring

2. Make sure the pliers are in expanding configuration, as illustrated.

   This means that bringing the pliers handles closer to each other drives away the pins from each other.

Figure 55 Pliers in expanding configuration



3. Insert the plier pins in the replacement clamp ring holes.
   For an easier installation, make sure the ring sits on the extremities of the pins.

Figure 56 Clamp ring sitting on plier

4. Push the encoder connector on the shaft toward the encoder arm.
5. Slightly expand the clamp.
6. Delicately install the clamp ring on the encoder shaft.

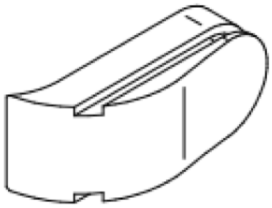
Figure 57 Clamp ring installation

7. Make sure the clamp ring is well seated in the groove.

Using Second-Generation Probes Without an Encoder

Do not leave the clip-on encoder connector of second-generation single-element probes exposed to dust and dirt. If you are not using the clip-on encoder, cover the protective cap supplied with the probe.

Figure 58 Clip-on encoder protective cap



Updating and Upgrading Software

Before you can perform any software maintenance, you must first meet the following requirements:

- USB mass storage device with a minimum of 4 GB free space
- Hardwired Internet connection

There are two ways of updating or upgrading the software:

Standard

1. Connect Lyft to a power outlet with the power cable.
2. Turn on Lyft and wait for the software to start.
3. Download the **.LyftUpdate* file from the Eddyfi website.
   Save the file in an easy-to-remember location on your computer.
4. Copy the **.LyftUpdate* to the root of a USB mass storage device.
5. Once copied, connect the mass storage device to one of Lyft's two USB ports
   A dialog box appears prompting you to proceed.

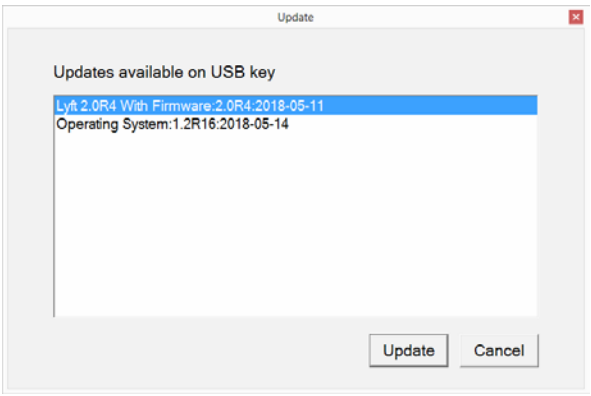
   Important

   Do not connect your mass storage device to the QUICK COPY USB port.
6. Tap **Yes**.
7. In the list that appears, tap the desired update file, and then tap **Update**.

   Important

   If you are performing a complete Lyft OS upgrade, perform steps 8 to 10. In the case of a software update, the instrument restarts automatically.

Figure 59 Update dialog box

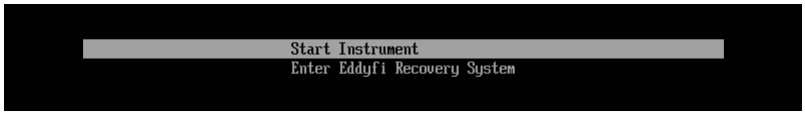


8. For **Yes**, press the keypad's up arrow.
   For **No**, press any other button. You are prompted to confirm again.
9. Press the keypad up arrow again.
   The update process starts. This normally takes 5 to 10 minutes, depending on the speed of your mass storage device. When the process is complete, the system restarts.
10. Activate Windows.
    See *Activating Windows* on page 60 for details.

System Recovery

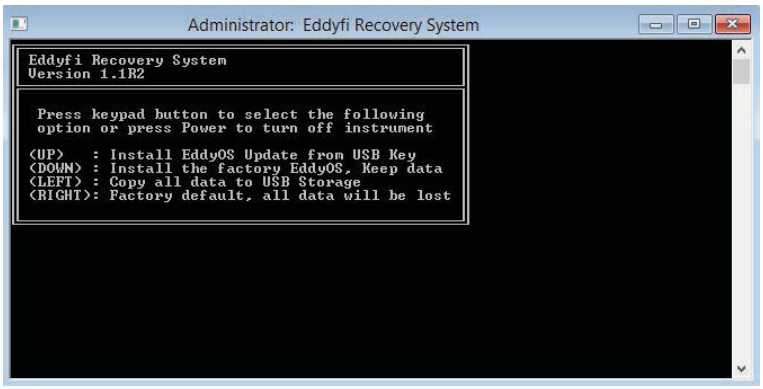
1. Connect Lyft to a power outlet with the power cable.
2. Make sure Lyft is off.
   If it is not, turn it off.
3. Turn on the instrument.
4. Immediately and simultaneously press the get point button and the change layout button (see page 2) until the following appears.

Figure 60 Options menu



5. With the keypad arrows, select **Enter Eddyfi System Recovery**, and then press the Enter button (see page 2).
   You are prompted to wait until the following appears.

Figure 61 System recovery interface



6. Using the keypad arrows, select **Install the factory EddyOS update, keep data**.
7. When prompted, press the up arrow of the keypad.
   The update process starts. This normally takes between 5 and 10 minute. When the process is complete, the system restarts.
8. Activate Windows.
   See *Activating Windows* on page 60 for details.

Activating Windows

Microsoft requires you activate Windows to be able to use it. The activation process is automatic when you connect Lyft to the Internet through an Ethernet cable.

1. Make sure Lyft is on and that the software is running.
2. Connect an Ethernet cable to Lyft.
3. Connect the other end of your Ethernet cable to a network (local area network or other access point).
4. Wait until a dialog box confirming the activation of Windows appears on screen.

   If you do not activate Windows, every time you start Lyft, a message reminds you to do so. You have 30 days to activate Windows before it locks up.

Known Issue With System Updates/Upgrades

On some units, a blue Windows error screen may appear when you attempt to enter the system recovery, which can cause the unit to start normally. Try performing the update procedure again.

Troubleshooting

Troubleshooting System Updates/Upgrades

No update file found

This appears in the update list or in the system recovery. Make sure that you only have one USB mass storage device connected to Lyft. Also make sure that the file is in the root folder of the device.

Cannot display the options screen

There may be several reasons for this to appear:

- You did not press and hold the get point button and the change layout button (see page 2) long enough
- You did not press and hold the correct buttons
- You did not press and hold the buttons quickly enough after turning on Lyft

Try holding the power button for two seconds, and then quickly pressing and holding the get point button and the change layout button.

Using the system recovery method, Lyft restarted normally or a blue error screen appeared on the screen

Perform the procedure again.

Unable to activate Windows

1. Make sure your Ethernet cable is sound.
2. Make sure that you have Internet access.
3. Make sure you are using DHCP.
4. After connecting the Ethernet cable and to the network, turn on Lyft.

   If you do not see a message warning you Windows is not activated when it starts, Windows is activated.

Chapter 8

Specifications

General

Table 13 General specifications

Specifications		Value
Dimensions (W×H×D)		355×288×127 mm (14.0×11.3×5.0 in)
Weight (with batteries)		6.6 kg (14.5 lb)
Volume		13 L (791 in^3)
Power requirements		100–240VAC ±10 % 50–60 Hz
Power supply		Direct VAC (100 W) or onboard batteries
Batteries	Type Typical life	Rechargeable lithium-ion, DOT compliant 6–8 hours (with both batteries in instrument)
Display		26.4 cm (10.4 in) Non-reflective (AR coating) Anti-fingerprint (oleophobic coating) 3 mm (1/8 in), chemically strengthened glass cover Optically bonded LCD and touchscreen Passive backlight enhancement
Video output		HDMI
Storage		SSD, 100 GB
Cooling		Sealed and fanless
Encoders		2 axes, quadrature
Connectivity		Gigabit Ethernet,Wi-Fi, Dual Mode Bluetooth® 2.1, 2.1+EDR, 3.0, 3.0+HS, 4.0 (BLE), USB 2.0 (×3)
Probe recognition and setup		Automatic

Environmental

Table 14 Environmental specifications

Specifications	Value
IP rating	Designed for IP65
Operating temperature	0–40 °C (32–104 °F)
Operating humidity	95 %, non-condensing
Storage temperature	–20–60 °C (–4–140 °F)
Storage humidity	95 %, non-condensing
Compliance	ASME, EN 61010-1, CE,WEEE, FCC Part 15B, ICES-003,AS/NZS CISPR 22, RoHS

Probes

Table 15 Single-element probe specifications

Specifications	Value
Models	Liftoffs: 0–305 mm (0–12 in), 0–203 mm (0–8 in), 0–76 mm (0–3 in) Built-in encoder Remote control keypad Lyft 27-pin Fischer connector Heavy-duty 5 m (16.4 ft) cable
Testing temperatures	Carbon steel structures: –150–500 °C (–238–932 °F) Weather jackets: maximum 70 °C (158 °F)
Accessories	Extension cable, from 15 m (50 ft) to 100 m (328 ft) Telescopic extension pole with embedded remote control keypad, up to 4.6 m (15 ft) long See page 6 and the PEC probe catalog for details.

Table 16 Array probe specifications

Specifications	Value
Models	Liftoffs: 0–100 mm (0–4 in) Built-in encoder Remote control keypad Lyft 27-pin Fischer connector Heavy-duty 5 m (16.4 ft) cable
Testing temperatures	Carbon steel structures: –150–500 °C (–238–932 °F) Weather jackets: maximum 70 °C (158 °F)
Accessories	Extension cable, from 15 m (50 ft) to 100 m (328 ft) See page 7 and the PEC probe catalog for details.

Performance

Table 17 Performance

Specifications	Value
Nominal wall thickness	Up to 100 mm (4 in)
Insulation (liftoff)	0–305 mm (0–12 in)
Dynamic data acquisition	Up to 15 points/s (GD and GDA models only)
Dynamic scan speed	Up to 75 mm/s (3 in/s) (GD and GDA models only)
Grid-mapping scan speed	Instant, less than 1 second (typical)
Smallest detectable defect volume	15 % of footprint volume (footprint × WT)
Minimum measurable remaining WT	15 % from nominal
Pipe diameter	Down to 25 mm (1 in)
Weather jackets	Stainless steel up to 1.5 mm (0.06 in) Aluminum up to 1 mm (0.04 in) Galvanized steel up to 0.5 mm (0.02 in)
SmartPULSE	Full thickness sensitivity (OD and ID flaw detection) Reliable measurements with liftoff variations, weather jackets overlaps, straps, and corrosion scabs One-point calibration (on nominal wall or known thickness value), auto-normalization, and repeatability optimization

Appendix A

Connector Reference

PEC Connector

The 27-pin connector available on the right side of the instrument, marked PEC, is specifically designed by Eddyfi. For details about this connector, contact Eddyfi directly at info@eddyfi.com.

I/O Connector

The I/O connector allows the instrument to send and receive various signals such as the acquisition start and stop commands, the encoder and rotation synchronization signals, the relay outputs, etc.

Table 18 I/O connector data

Number of contacts	12, female
Manufacturer P/N	Fischer DBPU 1031 A012-130
Eddyfi P/N	MACN4090
Suggested cable connector	Fischer S 1031 A012-142+ Eddyfi MACN0238

Table 19 I/O connector pinout

Pin	Signal	Description
1	+5VEXT_2	5V supply output
2	ENC1_PHA	Encoder phase A axis 1
3	ENC1_PHB	Encoder phase B axis 1
4	ENC2_PHA	Encoder phase A axis 2
5	ENC2_PHB	Encoder phase B axis 2
6	IN	Reserved
7	IN	Reserved
8	IN	Reserved
9	IN	Reserved
10	GND	Ground
11	OUT	Reserved
12	OUT	Reserved

Ethernet Connector

The Ethernet connector is used to connect the Lyft to a network through an Ethernet link. Eddyfi supplies a high-quality, military-grade Ethernet connector and cable. International Ethernet standards are used.

Table 20 Ethernet connector data

Type	RJ45, female
Manufacturer P/N	PEI Genesis,Amphenol RJF22B00SCC
Eddyfi P/N	MACN4016

Table 21 Ethernet connector pinout

Pin	I/O	Signal	Description
1	Bidirectional	Bi_DA+	Bidirectional pair A+
2	Bidirectional	Bi_DA–	Bidirectional pair A–
3	Bidirectional	Bi_DB+	Bidirectional pair B+
4	Bidirectional	Bi_DC+	Bidirectional pair C+
5	Bidirectional	Bi_DC–	Bidirectional pair C–
6	Bidirectional	Bi_DB–	Bidirectional pair B–
7	Bidirectional	Bi_DD+	Bidirectional pair D+
8	Bidirectional	Bi_DD–	Bidirectional pair D–

Important

Lyft must be linked to a workstation with a category 5e, shielded, Ethernet cable or better of a maximum length of 100 m (328 ft).

HDMI Connector

The HDMI connector is used to output video from Lyft to an external display. International HDMI standards are applied.

Table 22 HDMI connector data

Type	HDMI, female
Manufacturer P/N	Tyco Electronics 2007435-1
Eddyfi P/N	MACN4039

Table 23 HDMI connector pinout

Pin	Signal	Description
1	TMDS Data2+	Transition minimized differential signaling (TMDS) positive data 2
2	TMDS Data2 Shield	TMDS data 2 shield
3	TMDS Data2–	TMDS negative data 2
4	TMDS Data1+	TMDS positive data 1
5	TMDS Data1 Shield	TMDS data 1 shield
6	TMDS Data1–	TMDS negative data 1
7	TMDS Data0+	TMDS positive data 0
8	TMDS Data0 Shield	TMDS data 0 shield
9	TMDS Data0–	TMDS negative data 0
10	TMDS Clock+	TMDS positive clock
11	TMDS Clock Shield	TMDS clock shield
12	TMDS Clock–	TMDS negative clock
13	NC	Not connected
14	NC	Not connected
15	SCL	I2C serial clock for data display channel (DDC)
16	SDA	I2C serial data line for DDC
17	DDC/CEC/ARC/HEC Ground	Grounds for DDC, CEC,ARC, and HEC
18	+5V	5V supply (maximum 0.05A)
19	Hot Plug Detect	Hot plug detection pin

USB Connectors

The USB connectors support USB 2.0. You can use the USB connectors to connect USB-compliant devices to Lyft, including external memory, mouse, and keyboard. International USB 2.0 standards are applied.

Table 24 USB connector data

Type	USB, female
Manufacturer P/N	FCi 73725-0110BLF
Eddyfi P/N	MACN4038

Table 25 USB connector pinout

Pin	Signal	Description
1	VCC	5V supply
2	D–	Data–
3	D+	Data+
4	GND	Ground

Audio Jack

Table 26 Audio jack data

Type	3.5 mm audio jack, female
Manufacturer P/N	FCUI SJ1-3514-SMT-TR
Eddyfi P/N	MACN4048

Table 27 Audio jack pinout

Pin	Signal	Description
1	GND	Ground
2	Left	Left channel
3	Right	Right channel

Appendix B

Using the Optional Harness

Adjusting the Harness

Harnessing Lyft requires a number of specific adjustments so that you feel comfortable wearing the harness.

Adjusting the Harness to your Body

1. Grab the harness shoulder straps and slip it over your shoulders as you would a jacket.

Figure 62 Slipping the harness on

2. Verify the fit of the harness.

   Visualize working with Lyft before making any adjustments to the shoulder straps and height of the belt.

3. Slip out of the harness.

4. Use the underarm straps and shoulder blade rings to adjust the fit of your shoulder straps. You may need to perform this adjustment several times to get the proper fit.

Figure 63 Adjusting the shoulder straps

5. Use the back and side belt straps to adjust the height of the harness' belt to suit your body type. You may need to perform this adjustment several times to get the proper fit.

Note

Your belt's height determines the lowest position of Lyft. Adjust this height so that the display of the instrument is easy to see—for that, the belt could end up higher than your hips.

Figure 64 Adjusting the belt's height

6. Once your belt and shoulder straps are adjusted, clip and tighten the chest straps.

Figure 65 Securing the chest straps

7. Secure the belt around your waist, according to the height you have adjusted it.

Figure 66 Securing the belt

8. Make sure that the harness fits snuggly.
9. Make sure that the harness' shoulder anchor straps are loose.

Figure 67 Shoulder anchor straps

10. Unfasten the two straps at each end of the shoulder anchor straps. Place them within hands reach. You will need them.

Figure 68 Unfastening the straps

11. Sit down.
12. Place Lyft horizontally in your lap.
13. Slip the looped portion of the strap removed above in the hook of one of the two upper Lyft bumpers, as illustrated.

    Note

    Illustrated here is Reddy. Manipulations on Lyft are the same.

Figure 69 Sliding strap loop through bumper hook

14. Slip the clip through the strap hoop, and then pull to tighten into place, as illustrated.

Figure 70 Securing anchor strap

15. Repeat the previous two steps for the opposite upper bumper.

    Note

    You can also secure the straps to the bumpers in a more elegant and less easy-to-remove fashion, as illustrated here.

Figure 71 Alternative method of securing anchor strap to bumper

16. Locate the anchor strap on the harness' belt.

Figure 72 Anchor strap on harness belt

17. Open the battery compartment door and slip the male buckle of the anchor strap, as illustrated.

Figure 73 Slipping male buckle through bumper

18. Mate the male buckle to its female counterpart.

Figure 74 Mating battery compartment side anchor strap

19. Close and secure the battery compartment door.

Figure 75 Closing battery compartment door.

20. Repeat the procedure for the opposite belt anchor strap (no door to open).

21. Adjust the length of the anchor straps until comfortable.

22. Mate the left male buckle of the shoulder anchor strap to its female counterpart.

Figure 76 Mating shoulder anchor strap

23. Repeat for the opposite shoulder anchor strap.

24. Tighten each shoulder anchor straps to achieve the desired view angle for Lyft.

Figure 77 Tightening shoulder anchor straps

Note

Use the belt strap to hook your probe's cable.

Figure 78 Belt-slinging probe cable

Appendix C

Setting Up the Extension Pole

Setting Up the Extension Pole

The optional extension pole enables you to use Lyft® in hard-to-reach locations. Proceed as follows to ready the system for operation.

Installing the Extension Pole Supports on the PEC Probe

1. Locate the pocket on the side of the side of the extension pole carrying case.
2. From the pocket, remove the supports, screws, and tools.
3. According to the size of the probe you are using, select the appropriate supports.
   There are two supports per probe size.

Figure 79 PEC probe supports and screws

4. Place the probe on one side, and then align the support screw holes with those on the probe.
5. Using the supplied thumb screws, secure the support to the side of the probe.

Figure 80 Securing supports to PEC probe

6. Repeat for the second support on he opposite side of the probe.

Installing the PEC Probe on the Extension Pole

1. Slide the probe through the extension pole's head as illustrated.

Figure 81 Sliding PEC probe on extension pole head

2. Align the screw holes of the pole's head with the ones on the supports on the PEC probe.
3. Using the supplied screws, secure the probe to the pole's head.

Figure 82 Securing PEC probe to extension pole head

4. Release the topmost portion of the extension pole by pulling the latch.
5. Extend the topmost portion of the pole slightly.
6. Close the latch to secure the extension pole.

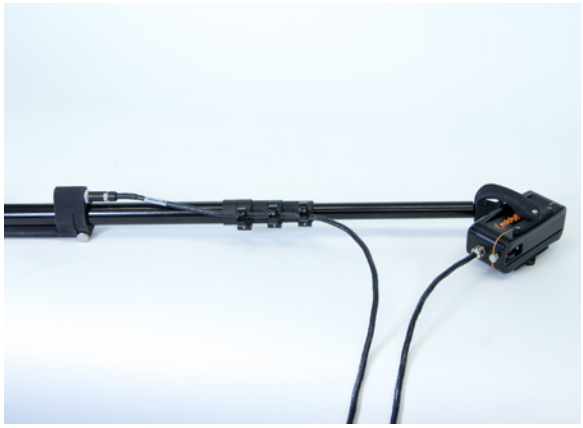
Connecting the Extension Pole to Lyft

1. Run the PEC probe connector and cable through the three hoops on the pole, as illustrated.

Figure 83 Running PEC probe cable through pole hoops

2. Connect the probe cable connector to the remote control on the pole.
3. Make sure that the connector clicks in place.

Figure 84 Connecting PEC probe connector to extension pole remote control



4. Connect the remote control connector to the Lyft PEC connector.

Appendix D

Using the Array Probe Straps

Adjusting the Probe Curvature

You can adjust the PECA probe curvature to fit flat surfaces and pipes as small as 152 mm (6 in) in outer diameter. The locking mechanism of the probe enables you to lock the curvature on the component and garantee a constant fit.

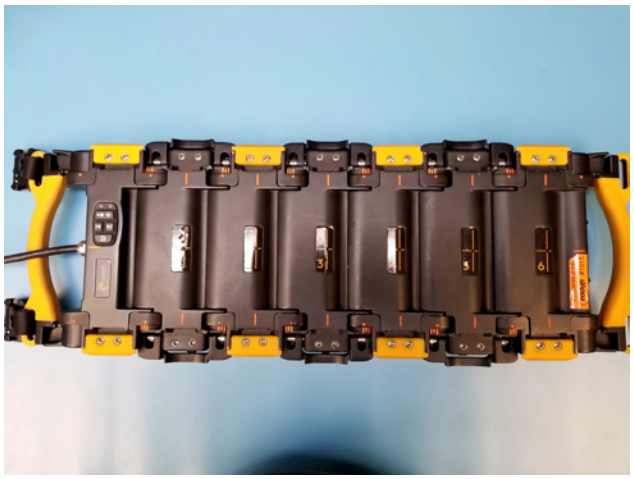
Unlocking the Probe Curvature

1. Locate the six locking latches on the probe, three to each side.

Figure 85 Locked latches

2. Unloack all six latches.

Figure 86 Unlocked latches



Fitting and Locking the Probe in Position

1. Lay the unlocked probe on your component.
2. Delicately lock the six latches.
3. Make sure the encoder wheel is in contact with the component.

Figure 87 Probe on a pipe with curvature locked

To make it easier to inspect pipes, install the accessory carriages and buckle the strap.

Installing Carriages

1. Insert the straps inside the channels of the carriages.
   You can adjust the position of the carriages on the straps later on.

Figure 88 Carriage installed on straps

2. Connect the end of the strap loops to the buckles on the other end of the probe

Figure D–5 Strap connected to the probe buckles

3. To limit the contact between the straps and the surface, adjust the position of the carriages on the straps.
4. Tighten the straps to ensure full support of the probe.

   To prevent damaging the weather jacket, do not overtighten the straps.

Installing Grid-As-U-Go™

1. Install the handle on the element ahead in the index direction.

   Refer to your PEC training material for details about probe positioning, as well as scan and index directions.

Figure 89 Handle installed on element 6

2. Install the marker/pen of your choice on Grid-As-U-Go.

Figure 90 Installed erasable marker

3. Secure Grid-As-U-Go to the probe handle accessory installed above.

Figure 91 Grid-As-U-Go the PECA probe

4. To ensure proper contact on the component, remove the cap from you marker or pen, and adjust its position in Grid-As-U-Go with the clamping screw.

Figure 92 Installed Grid-A-U-Go

Appendix E

Lyft Software & Service Plans Lyft Software Licensing Terms

Lyft Software and Service Plans/Lyft Software Licensing Terms

The following terms govern the licensing of the Lyft software (Lyft software licensing or LSL) and, as applicable, the offering of Lyft services—commercially marketed as Lyft software and service plans (LSSP) by Eddyfi Technologies (the "Terms").

By purchasing a Lyft instrument, you recognize the Lyft software is essential to operate the instrument and you agree to be bound by these terms. If you disagree with any of the terms outlined herein, you may not use the Lyft instrument or the Lyft software under any circumstance.

1. Definitions

1.1 Eddyfi refers to Eddyfi NDT Inc., Eddyfi International LLC, and any other wholly Eddyfi-owned subsidiaries and affiliates.

1.2 The Lyft instrument refers to an all-in-one, portable hardware device designed around pulsed eddy currents (PEC). PEC is a non-destructive testing technique where a transient eddy current is established in an electrically conductive material and the properties of the induced magnetic field are used to characterize some features of the test material. The Lyft instrument runs exclusively with the Lyft software.

1.3 The Lyft software or the Software refers to the source code allowing the use of the functionalities of the Lyft instrument, including all media, printed materials and electronic documentation, and any updates, add-on components, upgrades, and/or supplements provided subsequent to the initial installed version at the purchase of a Lyft instrument.

1.4 Licensee or Customer refers to the individual or single legal entity who acquires a Lyft instrument, subscribes to the LSL or the LSSP, and agrees to use it under these Terms.

1.5 The licensing of the Lyft software or LSL includes, from the renewal of the LSL, a 12-month Lyft software license, and all software updates/upgrades for 12 months.

1.6 The Lyft software and LSSP includes, from the date of delivery (INCOTERM 2010) of the Lyft instrument or renewal of the LSSP, a 12-month Lyft software license, an annual instrument calibration and 25-point preventive maintenance, all software updates/upgrades, all electronics/hardware and firmware updates/upgrades, a comprehensive warranty, which excludes however accidental or negligence damages, as well as technical support for 12 months. The LSSP does not cover Lyft probes, cables, or accessories.

2. Software License

2.1 The Software is only licensed, not sold, in accordance with the Terms.

2.2 The current license grants you, the Licensee, the non-exclusive rights to use the Software on a Lyft instrument.

2.3 THE SOFTWARE IS DESIGNED AND MANUFACTURED BY EDDYFI AND REMAINS ITS EXCLUSIVE PROPERTY. THE SOFTWARE IS NOT SOLD, BUT GRANTED UNDER LICENSE. The Licensee acknowledges the Software is proprietary to Eddyfi, and Eddyfi retains all rights, titles, and interests in the Software, including, without limitations, all copyrights and other proprietary rights. As more fully specified in 3.1, you may not use, reproduce, modify, sublicense, distribute, or dispose of the Software, in whole or in part, other than as permitted under the Terms. The rights granted herein do not convey any additional rights to the intellectual property of Eddyfi.

3. Software Restrictions

3.1 You must not and must not permit others to:

a. Modify, adapt, reproduce, or translate the Software.

b. Reverse engineer, decompile, decode, decrypt, disassemble, or otherwise attempt to discover the source code of the Software or in any way derive source code from the Software or create derivative rights from the Software.

c. Circumvent technological measures intended to control access to the Software or develop, distribute, or use with the Software any products circumventing the technological measures.

d. Rent, lease, sell, distribute, loan, transmit, sublicense, assign, or transfer the Software or your rights in the Software, or authorize any portion of the Software to be copied onto another's device.

4. Lyft Software and Service Plan

4.1 Eddyfi will provide the Customer with the licensing of the Lyft software (LSL) or the Lyft software and service plan (LSSP), as the case may be and as described in 1.5 and 1.6. Such descriptions may be the object of minor reviews and amendments at Eddyfi's discretion.

4.2 Eddyfi may limit or suspend the services offered under the LSL and LSSP if the Customer uses the Lyft software and the Lyft services in an abusive, unauthorized, or fraudulent manner, as determined by Eddyfi.

4.3 Eddyfi shall not be required to provide any Lyft service relating to problems or issues arising from:

(i) the Customer's use of the Lyft instrument or related products and equipment in a manner they were not designed for; (ii) the Customer's negligence, misuse, or modification of the Lyft instrument or related products and equipment; (iii) versions of the Lyft software other than the most recent version available at the time of service.

5. Subscription, LSL or LSSP Renewal, and Software Activation

5.1 The initial 12-month LSSP, as the case may be, is paid up front and delivered with the Lyft instrument. Afterward, the LSL or the LSSP must be renewed annually to ensure the functionality of the Lyft instrument. The Terms apply to any renewal.

5.2 The initial LSSP and respective renewals of LSL or LSSP thereafter will expire exactly one year from the delivery date or the renewal date. Failure to make the timely renewal payment for the LSL or the LSSP will result in the inoperability of the Lyft instrument.

5.3 The Software may require you to take certain steps to activate your Software or validate your LSL or your LSSP subscription. Failure to activate or validate the LSL or the LSSP subscription, or the determination by Eddyfi as abusive, fraudulent, or unauthorized use of the Software contrary to section 3 may result in reduced functionality, inoperability of the Software, or a termination or suspension of the subscription.

6. Warranty

6.1 The Software is provided AS IS. To the maximum extent permitted by the law, Eddyfi disclaims all warranties, express or implied, including the implied warranties of non-infringement, merchantability, and fitness for a particular purpose. Eddyfi further disclaims any warranty that (a) the Software will meet your requirements or will be or error-free; (b) the results that may be obtained from the use of the Software will be effective, accurate, or reliable; (c) the quality of the Software will meet your expectations; or that (d) all errors or defects in the Software will be corrected.

6.2 Eddyfi will use commercially reasonable efforts to provide the Lyft services in a professional manner, but Eddyfi cannot guarantee that every question or problem raised by the Customer can or will be resolved.

6.3 EXCEPT FOR ANY WARRANTY, CONDITION, REPRESENTATION, OR TERM TO THE EXTENT OF WHICH THE SAME CANNOT OR MAY NOT BE EXCLUDED OR LIMITED BY THE LAW APPLICABLE TO THE CUSTOMER IN ITS JURISDICTION, EDDYFI MAKES AND THE CUSTOMER RECEIVES NO WARRANTIES OR CONDITIONS OF ANY KIND, EXPRESS, IMPLIED, OR STATUTORY, RELATED TO OR ARISING IN ANY WAY FROM THE TERMS (INCLUDING THE LICENSE GRANTED HEREIN AND THE LSL OR THE LSSP OR THE PROVISIONS OF MATERIALS OR SERVICES UNDER SAID TERMS (INCLUDING THE LYFT SOFTWARE AND SERVICE PLAN)). EDDYFI SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

7. Limitations of Liability

7.1 EDDYFI'S LIABILITY UNDER THE LICENSE GRANTED HEREIN AND THE SERVICES RENDERED UNDER THE LSL OR THE LSSP ARE LIMITED TO THE AMOUNTS PAID BY THE CUSTOMER FOR EITHER THE LSL OR THE LSSP DEPENDING ON THE CHOSEN SUBSCRIPTION. IN NO EVENT SHALL EDDYFI BE LIABLE FOR ANY SPECIAL, PUNITIVE, INDIRECT, OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATIONS, DAMAGES FOR LOST PROFITS, LOSS OF DATA, COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, LOSS OF USE OF EQUIPMENT OR FACILITIES, OR INTERRUPTION OF BUSINESS, ARISING IN ANY WAY FROM THESE TERMS UNDER ANY THEORY OF LIABILITY, WHETHER OR NOT EDDYFI WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THESE LIMITATIONS

SHALL APPLY NOTWITHSTANDING THE FAILURE OF THE ESSENTIAL PURPOSE OF ANY LIMITED REMEDY.

8. Indemnity

8.1 The Customer agrees to indemnify and hold Eddyfi, its officers, directors, agents, employees, and partners harmless from and against any and all claims, liabilities, damages (actual and consequential), losses and expenses (including legal and other professional fees) arising from or in any way related to any third-party claims relating to the license granted herein, the services rendered under the LSL or the LSSP or your use of the Lyft instrument, any violation of these Terms or any other actions connected with your use of the Software (including all actions taken under your account).

9. Termination

9.1 The Customer may stop using the Lyft instrument and the LSL or the LSSP at any time with no refund from Eddyfi.

9.2 Notwithstanding the aforementioned, Eddyfi may terminate these Terms including the license granted herein and the services offered under the LSL or the LSSP, if:

a. the Customer breaches any provisions of these Terms (or acts in a manner that clearly shows you do not intend to, or are unable to, comply with these Terms);

b. the Customer fails to make the timely payment of fees for the LSL or the LSSP, if any; or

c. Eddyfi is required to do so by law (for example, where the provisions of the Software or LSL or LSSP to you are or become unlawful).

9.3 Upon expiration or termination of these Terms, your indemnification obligations, our warranty disclaimers or limitations of liabilities, and dispute resolution provisions stated in these Terms will survive.

10. Export

10.1 The Licensee may not export the Software to countries on the Canadian Area Control List (ACL) or to entities or persons ineligible under the Export and Import Permits Act and its Regulations to receive commodities, technology, and software. The Licensee agrees to comply with all export and import laws and restrictions and regulations of any Canadian agency or authority and with all applicable export and import laws and restrictions and regulations of any foreign agency or authority, and not to export, re-export or import the Software or any direct product of the Software thereof in violation of any such restrictions, laws and regulations.

11. Governing Law and Jurisdiction

11.1 The present Terms shall be construed and enforced in accordance with the laws in force in the Province of Quebec, Canada, without giving effect to rules on conflict of laws.

11.2 At the option of Eddyfi, these Terms may also be construed and enforced in accordance with the laws in force in any other jurisdiction where the Lyft instrument may be located, without giving effect to their rules on conflict of laws. At the exclusive discretion of Eddyfi, appropriate proceedings may also be filed in all jurisdictions where the Licensee or the Lyft instrument is or may be located.

11.3 The parties agree any claim whatsoever arising from or related to the interpretation, application, performance, term, validity, termination, or effects of these Terms shall be submitted to the Judicial District of Québec City (Province of Quebec, Canada) for the hearing of said claims at the exclusion of any other jurisdiction that may otherwise be competent under the provisions of the law. The Customer hereby waives any claims which it may now or hereafter have that the aforementioned jurisdiction is not a convenient or proper venue for any proceedings in relation to these Terms.

12. Complete Understanding

12.1 These Terms constitute the entire Agreement between the parties concerning the use of the Software and the LSL or the LSSP and replaces any previous written or verbal debate, negotiation, or agreement. No modifications to this license is valid without the express written consent of Eddyfi.

13. Trademarks

13.1 Eddyfi, the Eddyfi logo, Lyft, SmartPULSE, Grid-As-U-Go, and the Lyft logo are trademarks or registered trademarks of Eddyfi NDT Inc.

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