Eddyfi Technologies
Beyond current

Getting Started with

PAINTBRUSH2



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Manual version: A

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Chapter 1

User Manual

1 User Manual

This user manual contains essential information on how to use the **PaintBrush 2** scanner safely and effectively. Before using the scanner, please review this information. Use the scanner as intended.

Keep this manual in a safe place for future reference.

Chapter 2

Important Information, Safety Precautions, and Conventions

2 Important Safety Precautions and Symbols

This section provides the most important precautions to follow and identifies and explains the various safety symbols found on the instrument and its accessories. Before turning on the instrument and the accessories, make sure that the proper safety precautions are taken, as described below.

2.1 General Precautions

- Before turning on your equipment, carefully read the instructions in this user manual and those found in the instrument user manual.
- *Never* touch connector pins when the instrument is turned on, as high voltage may be present.
- Keep this user manual in a safe place for future reference.
- Follow the installation and operation procedures carefully.
- Heed the safety warnings found on the PaintBrush 2 scanner and in this manual.
- The PaintBrush 2 scanner has been designed for non-destructive evaluations of industrial and commercial materials. Do not use the instrument, the PaintBrush 2, and the accessories for any purpose other than the intended use stated above.
- The mains plug of the AC/DC adapter for your data acquisition unit must only be inserted into a socket outlet that is provided with a protective earth contact. You must not negate the protective action by using an extension cord (power cable) without a protective conductor (grounding). Grounding one conductor of a two-conductor outlet is not sufficient protection.
- Only use cables and accessories approved by Eddyfi Technologies for your PaintBrush 2 scanner.

- Whenever it is likely that the ground connection is ineffective, turn off the instrument and disconnect the PaintBrush 2 scanner.
- If the equipment is used in a manner not specified by Eddyfi Technologies, the protection provided on the equipment may be impaired.
- Do not install substitute parts or perform unauthorized modifications to the PaintBrush 2 scanner or to your Eddyfi Technologies instrument.
- The PaintBrush 2 scanner must only be serviced by Eddyfi Technologies. If you experience problems or questions regarding your equipment, contact Eddyfi Technologies or an authorized representative.
- Eddyfi service personnel shall apply best practices for maintenance of the PaintBrush 2 scanner.

2.2 Electrostatic Discharge Precautions

Should you ever have to disassemble a PaintBrush 2 scanner or touch any internal components (under Eddyfi Technologies' authorized supervision), make sure that you take all the necessary precautions against electrostatic discharge (ESD). ESDs can permanently damage electronic components in your system. Electrostatic damage to components can take the form of disruptions or even catastrophic system failures. Moreover, omitting to take appropriate precautions could void your warranty.

The basic rules of ESD control are:

- Handle ESD-sensitive components only in protected work areas. Always ground yourself when handling ESD-sensitive components or assemblies. Be sure to use the proper maintenance and work procedures in conjunction with the type of material.

- Always use a conductive or shielding container during storage or transportation of ESD-sensitive components or assemblies (for example, printed circuit boards). The materials used must create a Faraday cage, which will isolate the contents from electrostatic charges.
- Open ESD-safe containers only at a static-safe workstation. Such a workstation will include equipment to perform three critical functions: grounding, isolation, and neutralization.

At the static-safe workstation, follow this procedure before beginning any work:

1. Test your grounding devices to ensure that they are functioning properly.
2. Put on your wrist strap or foot grounding devices.
3. Check all grounding cords to make sure they are properly connected to ground, ensuring the effective dissipation of electrostatic charges.
4. Turn on an ion generator, if available. This will help dissipate static charges from any nonconducting materials.
5. Make sure that your work surface is clean and clear of unnecessary materials, particularly common plastics.
6. When handling electronic devices, hold the components by their plastic edges. Avoid touching the metal leads.
7. Avoid bringing components in contact with your clothing, hair, or other nonconducting materials.

The above procedure is only a summary of the measures to be taken against electrostatic discharges. Please consult the literature dedicated to that topic for more details.

2.3 Intended Use

The PaintBrush 2 is designed to perform non-destructive inspections using ultrasound (UT) or eddy current technologies.

WARNING!



Do not use the **PaintBrush 2** for any purpose other than its intended use.

2.4 PaintBrush 2 Compatibility

Use the **PaintBrush 2** with approved equipment only.

CAUTION



Always use equipment and accessories that meet Eddyfi Technologies specifications. Using incompatible equipment could cause malfunctions and/or damage, or human injury.

2.5 Repair and Modifications

The PaintBrush 2 does not contain any user-serviceable parts. Opening the PaintBrush 2 may void the warranty.

CAUTION



To prevent human injury and/or material damage, do not disassemble, modify, or repair the PaintBrush 2.

2.6 Equipment Disposal

Check and follow your local laws, rules, and regulations for the safe disposal of the PaintBrush 2.

2.7 CE (European Conformity)



The PaintBrush 2 complies with the requirements of Directive 2014/30/EU concerning electromagnetic compatibility, Directive 2014/35/EU concerning low voltage, Directive 2014/53/EU concerning health, safety, electromagnetic compatibility, and use of the radio spectrum, and Directive 2015/863 which amends 2011/65/EU concerning restriction of hazardous substances (RoHS). The CE marking is a declaration that this product conforms to all the applicable directives of the European Community.

2.8 UKCA (United Kingdom)



The PaintBrush 2 complies with the requirements of the Electromagnetic Compatibility Regulations 2016, radio equipment regulations 2017 concerning health, safety, electromagnetic compatibility, and use of the radio spectrum, the Electrical Equipment (Safety) Regulations 2016, and the Restriction of the Use of Certain Hazardous Substances in the Electrical and Electronic Equipment Regulations 2012. The UKCA marking indicates compliance with the above regulations.

2.9 WEEE Directive



Following European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately. Refer to your local Eddyfi distributor for return and/or collection systems available in your country.

2.10 China RoHS

China RoHs is the term used by industry generally to describe legislation implemented by the Ministry of Information Industry (MII) in the People's Republic of China for the control of pollution by electronic information products (EIP).



The China RoHS mark indicates the product's Environment-Friendly Use Period (EFUP). The EFUP is defined as the number of years for which the listed controlled substances will not leak or chemically deteriorate while in the product. The EFUP for the PaintBrush 2 has been determined to be 15 years.

Note: The Environment-Friendly Use Period (EFUP) is not meant to be interpreted as the period assuming functionality and product performance.



电器电子产品有害物质限制使用标志

本标志是根据“电器电子产品有害物质限制使用管理办法”以及“电子电气产品有害物质限制使用标识要求”的规定，适用于在中国销售的电器电子产品上的电器电子产品有害物质使用限制标志。

（注意）电器电子产品有害物质限制使用标志内的数字为在正常的使用条件下有害物质等不泄漏的期限，不是保证产品功能性能的期间。

产品中有害物质的名称及含量

部件名称		有害物质					
		铅及其化合物 (Pb)	汞及其化合物 (Hg)	镉及其化合物 (Cd)	六价铬及其化合物 (Cr(Ⅵ))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
主体	机构部件	×	○	○	○	○	○
	光学部件	×	○	○	○	○	○
	电气部件	×	○	○	○	○	○
附件		×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T26572 规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T26572 规定的限量要求。

2.11 EMC Directive Compliance

The Paintbrush 2 has been tested and found to comply with the limits for an industrial device in accordance with the specifications of the EMC directive.

2.12 FCC (USA) Compliance

Note The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment.

IMPORTANT Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the product.

FCC Supplier's Declaration of Conformity

Herby declares that the product,

Product name: PaintBrush 2

Models:

1) PaintBrush 2 with LEMO16 connector and cable options 5m and 10m. Other cable lengths may be available upon request.

2) PaintBrush 2 with DE15 connector and cable option 5m and 10m. Other cable lengths may be available upon request.

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107 and Section 15.109

Supplementary information:

This complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Responsible party name:

Eddyfi Technologies

3425, rue Pierre-Ardouin, Quebec, Canada G1P 1N7

418-780-1565

2.13 Canada – Industry Canada (IC)

The PaintBrush 2 complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) those devices may not cause interference, and (2) those devices must accept any interference, including interference that may cause undesired operations of this device.

Le PaintBrush 2 est confome aux normes RSS exemptes de licence d'Industrie Canada. L'utilisation est assujettie aux deux conditions suivantes : (1) ces dispositifs ne peuvent pas causer d'interférences, et (2) ces dispositifs doivent accepter des interférences, y compris des interférences qui peuvent causer des opérations non désirées de ces dispositifs.

2.14 ICES-001 (Canada) Compliance

This Class A digital apparatus complies with Canada ICES-001.

Ces dispositifs numériques de la classe A sont conformes à la norme NMB-001 du Canada.

2.15 Marking and Symbols

The following symbols can appear on the devices and pertain to safety regulations that should be followed carefully.



The crossed pacemaker symbol is used to indicate a potential hazard to the bearer of those devices and other sensitive devices (such as neurostimulators and metallic implants). The PaintBrush 2 uses strong magnets to adhere securely to metallic surfaces; such powerful magnets can interfere with bionic devices. Refer to the user manual to ensure proper protection and safe practice.



The exclamation mark label is used as a general warning sign. It indicates that you should refer to this user manual to obtain the information necessary to ensure the proper protection of the devices and its users.



The lightning flash with arrowhead label is used as a high voltage sign. It indicates the presence of hazardous voltages (within the product enclosure or accessible externally) that can be of sufficient magnitude to constitute a risk of electric shock to persons. Always refer to the user manual to ensure proper protection and safe practices.



The "Crossed-Out Wheeled Bin" marking acts as a reminder that the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling in accordance with the local regulations applicable to Waste Electrical and Electronic Equipment (WEEE).

2.16 Conventions of this Manual

The various typographical conventions explained below were defined to standardize and simplify the look and feel of this documentation.

Italic

An italic typeface is used to indicate emphasis on a specific word or phrase (for example: This option should *never* be checked.)

Bold

A bold typeface is used to indicate the name of a menu item or a named user interface element (for example: the **File** menu, the **Options…** button, etc.) Generally, items in bold are capitalized to reflect the capitalization used on screen.

SMALL CAPITALS

Small capitals are generally used when reference is made to inscriptions found "as is" on an instrument (buttons, connectors, indicator lights, etc.).

Chapter 3

PaintBrush 2 Scanner

3 Introducing the PaintBrush 2 Scanner

Eddyfi Technologies provides a complete, integrated solution to help you maximize the capabilities of your inspection system. With the PaintBrush 2 scanner, you can enhance the examination of large surfaces.

The PaintBrush 2 is a handheld scanner equipped with built-in encoders and magnetic wheels (for carbon steel) or non-magnetic wheels (for composite materials).

Its dual-encoder design translates freehand motion into a scan-indexed inspection canvas. Because its movement isn't limited to a single axis, you can freely "paint" over the surface area. This makes the PaintBrush 2 ideal for performing phased array UT thickness measurements across large areas that typically require multiple scan lines.

The PaintBrush 2 seamlessly integrates with your instrument using an automatic detection feature that sets parameters such as encoder resolution and scanner configuration.

Additionally, a built-in control button allows you to pause and reset data acquisition quickly and easily.

Chapter 4

Configurations

4 PaintBrush 2 Scanner Configurations

The PaintBrush 2 is available in multiple variants, offering different cable lengths and connector configurations to suit your system requirements.

Table 1 – PaintBrush 2 configurations

SCAN-PAINTBRUSH2-5M-LE	PaintBrush 2 with 5m cable and LEMO16 connector
SCAN-PAINTBRUSH2-10M-LE	PaintBrush 2 with 10m cable and LEMO16 connector
SCAN-PAINTBRUSH2-5M-DE15	PaintBrush 2 with 5m cable and DE15 connector
SCAN-PAINTBRUSH2-10M-DE15	PaintBrush 2 with 5m cable and DE15 connector

You can find information about the available accessories to optimize your inspection in the "Accessories" section on page 62.

Warning



Using the equipment in a manner not specified by Eddyfi may impair its protective features. Always consult the user manual for proper operation and best practices.
The PaintBrush 2 is intended for use by trained personnel only. Always follow local safety regulations to avoid hazardous situations during operation.

Chapter 5

Scanner Overview

5 Overview of the PaintBrush 2 scanner

The PaintBrush 2 scanner is engineered to adapt to large surface components of various diameters, ranging from 4 inches to flat surfaces, and different thicknesses.
The updated design features improved probe compatibility: the PaintBrush 2 now supports DLA, A11/A12 zero-degree, and Near Wall (NW1) probes.



Figure 1 – PaintBrush 2 Scanner

Your PaintBrush 2 scanner allows you to:

- **Perform Free Motion Scan Patterns**

  The key feature of the PaintBrush 2 scanner is its ability to move freely over the surface during inspection. As long as both wheels remain in contact with the surface, you can move in any direction, including turning, and data acquisition will seamlessly follow.

- **Pause and Restart your Data Acquisition**

  Pressing the front button on the PaintBrush 2 scanner pauses data acquisition, allowing to reposition the scanner without recording signals while retaining encoded position feedback. Press it again to resume acquisition.

- **Reset your Encoder Positions**

  Pressing and holding the front button on the PaintBrush 2 scanner for three (3) seconds resets the encoder positions on both the scan and index axes to zero (0).

Chapter 6

Before You Begin

6 Before You Begin

Please review the following sections before using your PaintBrush 2 scanner. This chapter provides detailed instructions on connecting and assembling the various accessories to help you better integrate and optimize your inspection solution.



Warning! The PaintBrush 2 scanner uses powerful magnets to maintain firm contact with the inspection surface. These magnets may interfere with bionic or medical devices. Operators with pacemakers, neurostimulators, or metallic implants should take appropriate precautions to avoid potential hazards.

6.1 How to Connect to your Data Acquisition Unit

To connect your PaintBrush 2 to your data acquisition unit, simply take the encoder cable and make sure it is properly connected to both the scanner and your system.

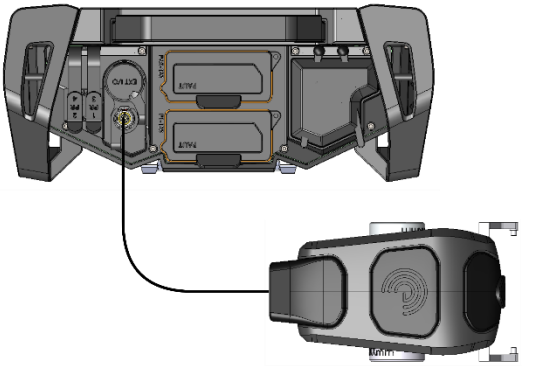


Figure 2 Connecting the PaintBrush 2 to the Cypher® instrument.

IMPORTANT: Your PaintBrush 2 scanner features an auto-detection capability, similar to the auto-detection used with phased array UT probes, that provides essential parameter information to your system, such as scanner identification and nominal encoder resolution. The auto-detection signal is transmitted through the encoder cable.

Before connecting the PaintBrush 2 to your instrument, ensure that the correct software version is installed. Also, make sure the instrument is powered ON for the auto-detection feature to function properly.

6.2 Probe/Wedge Assembly Attachment

To attach or remove a probe/wedge assembly on the probe holder (i.e. “forks”):

1. Using the provided Allen key, loosen the screw of one of the two holder arms until you can remove it.

   This allows you to remove a probe/wedge assembly currently in place.

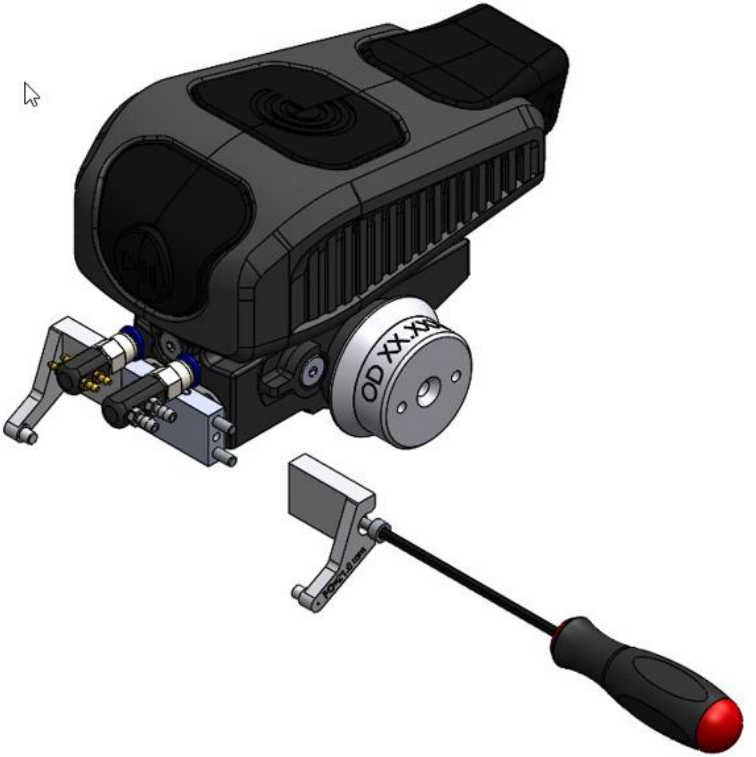


Figure 3 Probe/Wedge Assembly Attachment

2. To attach a probe:

2 a. Position the probe/wedge assembly between the two holder arms.

2 b. Move the loosen arm to secure the probe/wedge assembly in the holder.

2 c. Using the provided Allen key, tighten the screw in place.

Depending on the selected probe/wedge assembly, you may require different sets of holder arms:

Table 2 Holder Arms

Probe type	Fork
DLA	SCAN-SPARE-PB2-DLA-FORK compatible with probe shoes: - SCAN-ACC-DLA-SHOE-CS - SCAN-ACC-DLA-SHOE-CL
A11 or A12	SCAN-SPARE-PB2-A11-A12-FORK compatible with wedge: WSA11-A12-0L-FLAT-20mm-IHC
NW1	SCAN-SPARE-PB2-NW1-FORK-KIT compatible with wedge: WSNW1-0L-FLAT-20mm-IHC

Chapter 7

PaintBrush 2 Scanner in UltraVision®

7 Positioning your PaintBrush 2 Scanner in UltraVision®

For the data mapping to accurately reflect how the PaintBrush 2 was moved over the specimen, it is essential to define the scanner's start position and orientation.

To define a PaintBrush 2 inspection sequence:

1. Go to the **Mechanical** menu.
2. From the **Sequence** tab, select **Paintbrush**.



3. In the **PaintBrush** tab, you have access to the **Position** function, which provides a user-friendly interface to define all mechanical offsets.

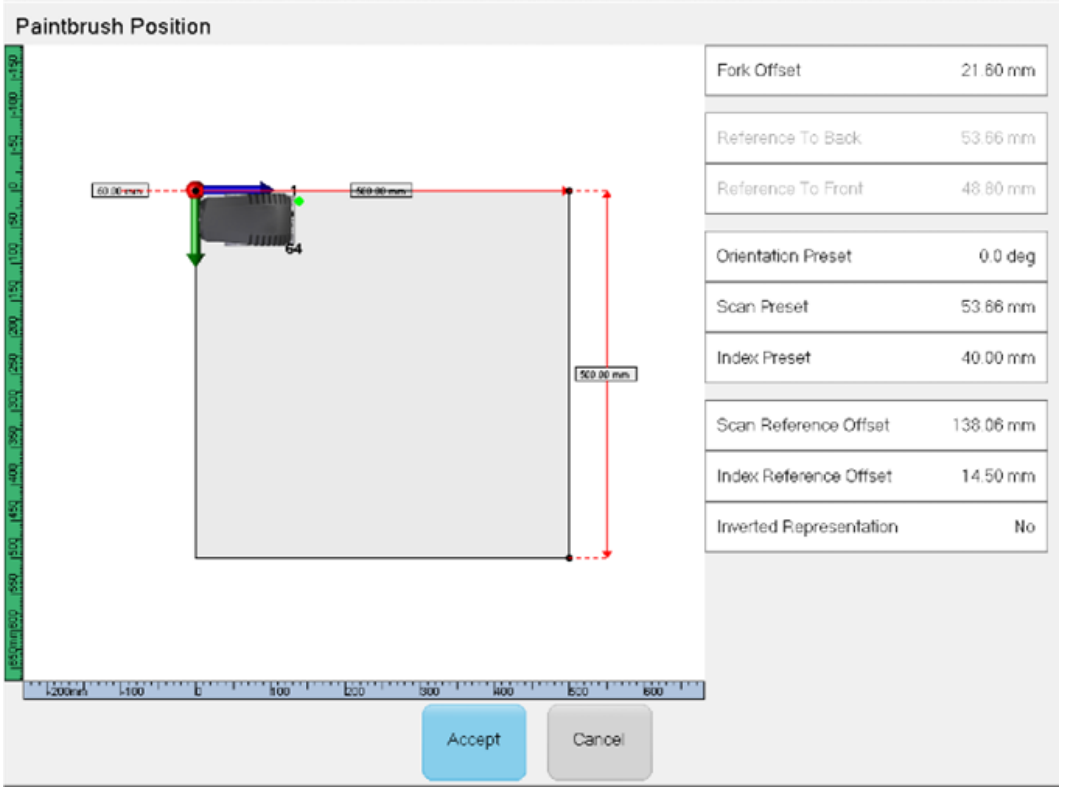


Figure 4 Paintbrush Position Dialog box

The default location of your PaintBrush 2 scanner is in-line with the scan axis origin (left scanner wheel) and in-line with the index axis origin (back of the scanner).

For offsets calculation, the software uses the point in the middle of the wheels as a reference.

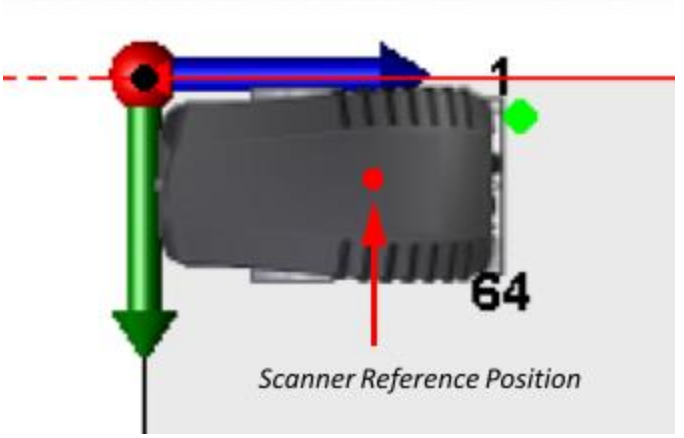


Figure 5 PaintBrush 2 Reference Position

To position your PaintBrush 2 scanner, you can either enter preset and offsets values or use your finger to tap on different locations.

If you tap the specimen corners, the PaintBrush 2 scanner will automatically be positioned there, and the offsets will be changed accordingly.

If you click on the scanner itself, it will rotate clockwise by 90°. Each additional tap rotates the scanner 90° and the preset and offsets values are adjusted automatically.

You can also invert the scan/index representation by modifying the **Inverted Representation** parameter.

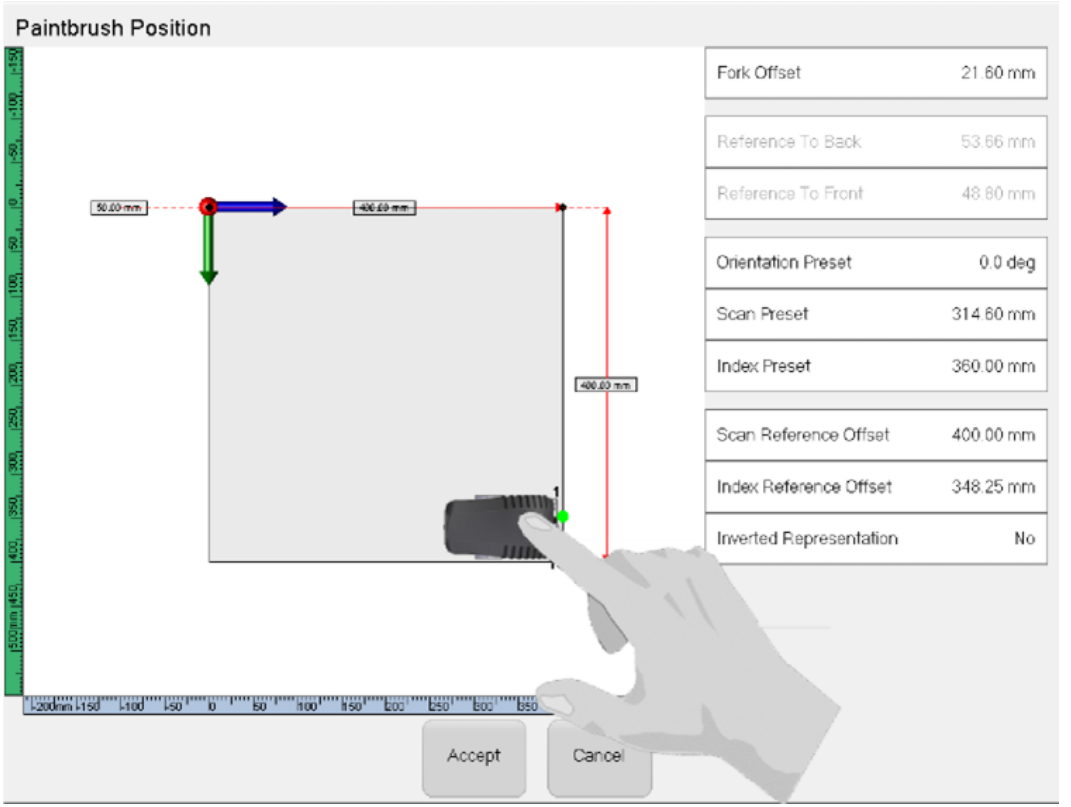


Figure 6 Quick Positioning Example

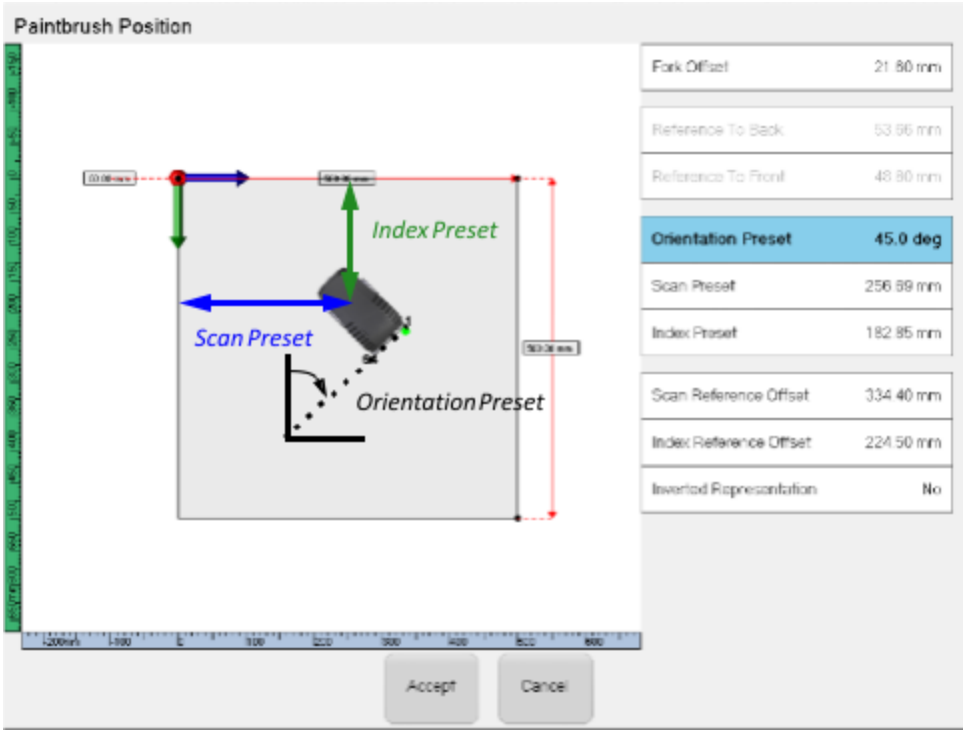


Figure 7 Paintbrush Position Example: Orientation Preset, Scan Preset and Index Preset

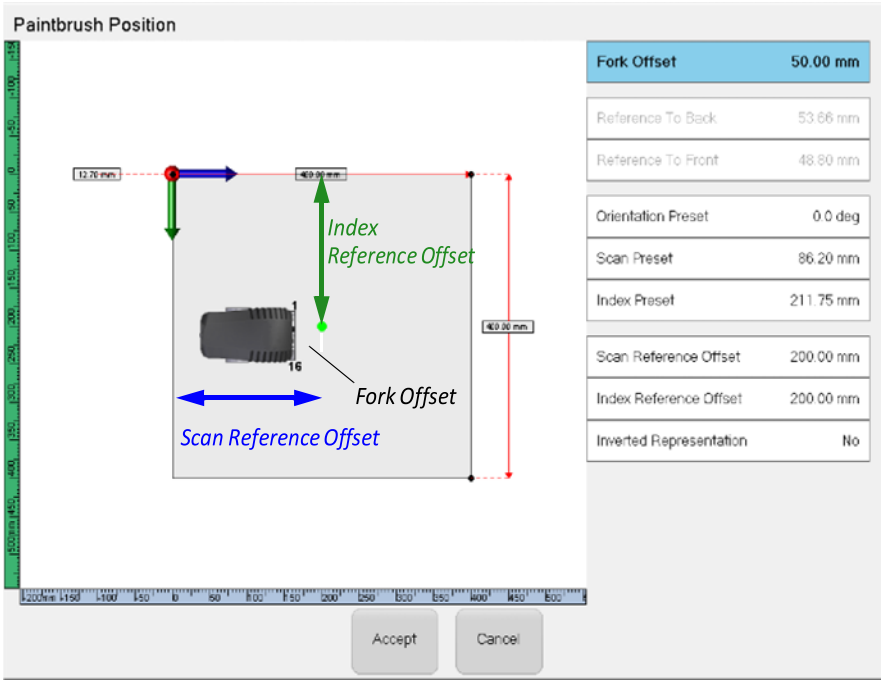


Figure 8 Paintbrush Position Example: Fork Offset, Scan Reference Offset and Index Reference Offset

Chapter 8

Inspection Configuration in UltraVision®

8 Creating an Inspection Configuration in UltraVision

The TOPAZ® with its UltraVision Touch® interface is a powerful tool that is ready to tackle many inspection challenges. With the PaintBrush 2 scanner, you get an enhanced experience for large surface specimen examination. The following chapter provides a guide to prepare PaintBrush 2 inspection configurations.

This guide focuses on the features of the PaintBrush 2 scanner. For more in-depth look at the standard TOPAZ software functions, refer to the TOPAZ user manual.

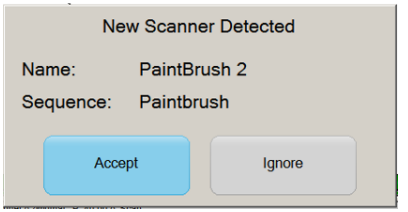
The Paintbrush 2 can accommodate a wide variety of probes. The following example presents a generic procedure to implement thickness measurement using PaintBrush 2.

Situation	Thickness inspection of a *carbon steel plate with a nominal thickness of 12.7 mm (0.5 in.)* using one 5L64-A12-38.4X10-2.5-IPEX probe and WSA12-0L-FLAT-20mm wedge.
Scanning Method	*Encoded Paintbrush scan* Scanning mechanism: *PaintBrush 2 Scanner*
Recording	Storing c-scan amplitude and position signals

To implement a thickness measurement configuration:

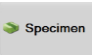
1. Connect your PaintBrush 2 scanner to your TOPAZ.

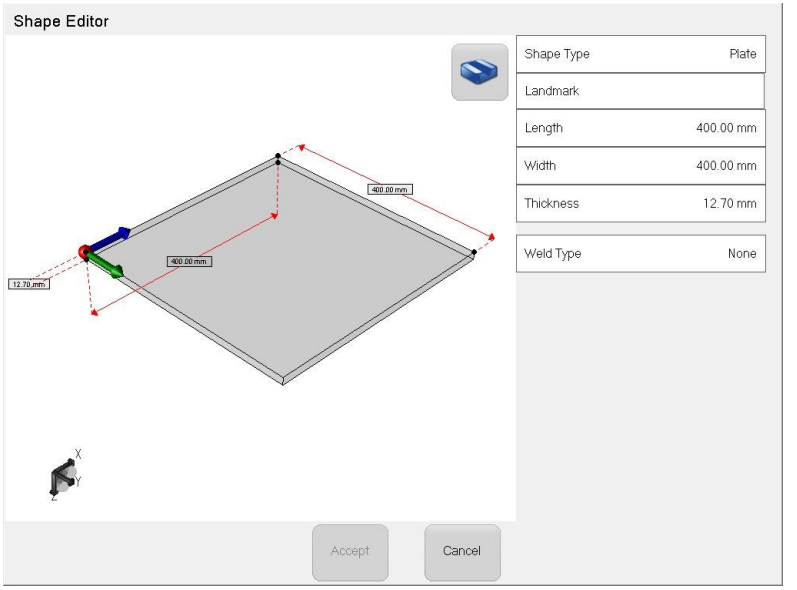
   The auto-detection window will appear and display the newly connected scanner.



2. Tap **Accept**.

Encoder resolution and wheel diameters hard-coded in the PaintBrush 2 scanner are implemented in the TOPAZ interface.

3. Define your **Specimen**. 



3 a. Set the **Shape Type** to **Plate**.

3 b. Specify the dimensions of the plate (**Length** and **Width**).

3 c. Specify your specimen **Thickness**: 12.7mm (or 0.5in.).

3 d. Tap **Accept**.

Your specimen shape is now defined.

3 e. Set your **Material** to **Steel**.

This also defines the sound velocities that will be used for the focal law calculations.

4. Define your first **Channel** settings.

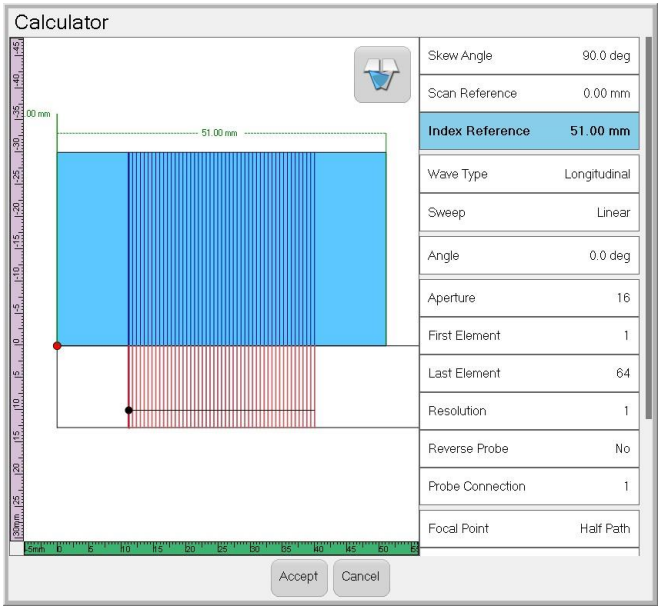
4 a. Set your **Channel** name.

It is your choice to either rename the channel or leave the default name. However, for multiple channel configuration, it is good practice to provide a meaningful name using channel characteristics.

*4 b.*Set your channel **Configuration** to **Phased Array Pulse Echo**.

4 c. Connect your phased array UT probe for auto-detection (with a 0° wedge) or select a **Probe** from the database (5L64-A12-38.4X10-2.5-IPEX) and select a **Wedge** from the database (WSA12-0L-FLAT-20mm).

4 d. Define your **Calculator** parameters. 



4 e. Set your **Skew Angle** to 90°.

4f. Define your **Scan Reference**

4 g. Set **Index Reference** to 0mm.

4 h. Set **Wave Type** to **Longitudinal**.

Selecting the wave type defines the sound velocity used for the calculations which comes from the material selection.

4 i. Set **Sweep** to **Linear**.

4 j. Set the *refracted* **Angle** to 0°

4 k. Set the **Aperture** size to 16.

4 l. Set the **First Element** to **1**.

First element used by the first active aperture.

4 m. Set the **Last Element** to **64**.

Last element used by the last active aperture.

*4 n.*Set your **Focal Point** to **Half Path**.

*4 o.*Set **Position** to 10.0mm (0.393in).

*4 p.*Set **Timebase Type** to **Half Path** or **True Depth**.

*4 q.*Define **Timebase Start** and **Timebase Range**.

*4 r.*Tap **Accept**.

This configuration creates 49 different beams by literally moving the active aperture (16 elements) along the array. This is also called electronic scanning.

5. Adjust your ultrasound settings (**UT Settings** menu).

5 a. Set your **General** parameters (**Gain**, time base...).

5 b. Set your **Pulser & Receiver** parameters (**Voltage**, **Pulse Width**, **Rectification**, **Filter** and **Smoothing**).

6. To create c-scan data, define your **Gates** parameters.



6 a. Tap **Gate** and select **Gate 1**.



6 b. Set **State** to **On**.

*6 c.*Define the gate **Start**, **Range** and **Threshold**.

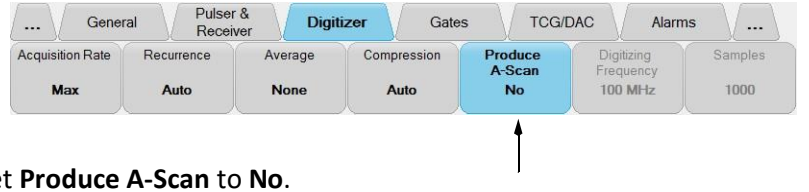
Adjust these parameters in order to monitor the inside of the plate (without the nominal back-wall location).

6 d. Set the detection mode of the gate (**Trigger**): **Crossing** or **Maximum**.

back-wall echo location.

7 In the **UT Settings** menu, go to the **Digitizer** sub-menu.



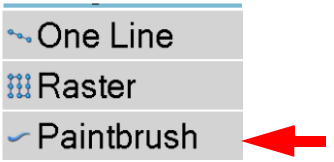


8.Set **Produce A-Scan** to **No**.

Your configuration will now only record c-scan data information.

9. To define your *PaintBrush* inspection sequence, go to the **Mechanical** menu. 

10. In the **Sequence** tab, select **Paintbrush**.



11. In the **Sequence** tab, you can now define the **Scan Start**, **Stop** and **Resolution**.

12. In the **Sequence** tab, you can now define the **Index Start**, **Stop** and **Resolution**.

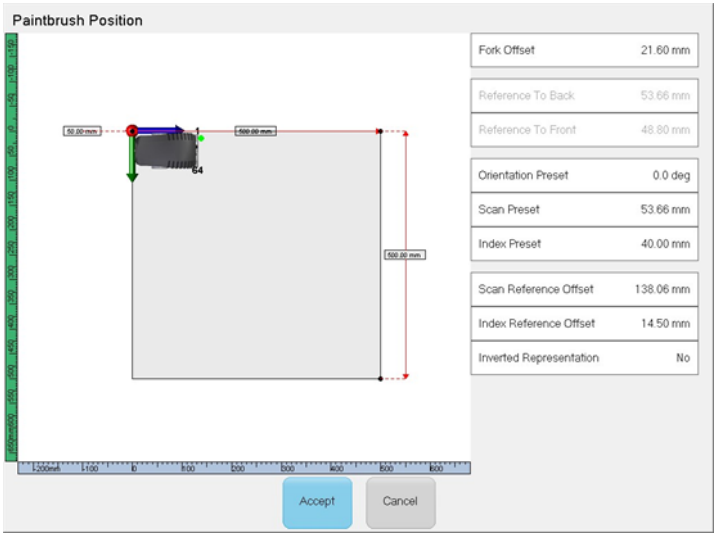
13. To position your PaintBrush 2 scanner to its *start* location on your specimen:

13 a. Go to the **Paintbrush** tab.



13 b. Tap **Position**.

The **Paintbrush Position** windows appears.



13 c. Define **Fork Offset**.

The **Fork Offset** value depends on the probe/wedge holder design. It is the distance between the front of the scanner and the probe/wedge reference point.

13 d. Define the **Orientation Preset**.

Orientation of the scanner according to the scan and index axes (see Figure 3-1).

13 e. Define the **Scan Preset**.

Distance between the scanner reference point and the origin of scan/index coordinate system along the scan axis (see Figure 3-1).

13 f. Define the **Index Preset**.

Distance between the scanner reference point and the origin of scan/index coordinate system along the index axis (see Figure 3-1).

IMPORTANT: It is important that your defined positioning is exactly where you will start your inspection for your data to be properly mapped on your specimen. **Scan Reference Offset** and **Index Reference Offset** are automatically defined from the values above.

These values are defined per the probe/wedge assembly reference point (green dot on the front of the scanner).

---

13 g. Tap **Accept** once your start location and orientation are correctly defined.

Chapter 10

Maintenance

9 Maintenance

You will find in the following pages the basic maintenance that you can perform on the PaintBrush 2 to keep it in good working condition. Keep in mind that, by design, the PaintBrush 2 requires only minimal maintenance.

9.1 Cleaning the PaintBrush 2

The PaintBrush 2 external surface can be cleaned when needed.

To clean the PaintBrush 2:

1. Make sure the PaintBrush 2 is disconnected from the instrument.
2. To bring the devices back to their original finish, clean the housing and the front panel with a soft cloth.

Caution



Never use a water jet, spray can, or spray bottle to clean the scanner. Wet connector contacts can lead to short circuits upon cable connection.

3. To get rid of persistent stains, use a slightly damp cloth with mild soap. Do not use abrasive products or powerful solvents that might damage the finish.
4. To remove dirt from the PaintBrush 2 scanner wheels, you can use a soft cloth or the sticky side of a tape.

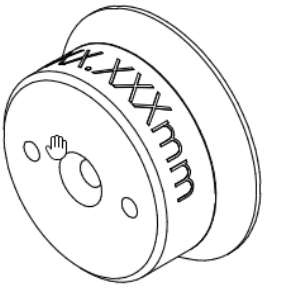
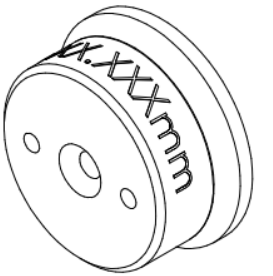
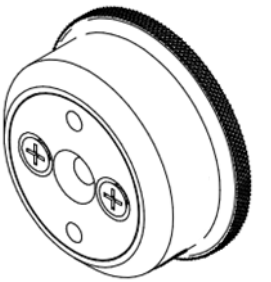
9.2 Changing Scanner Wheels

The PaintBrush 2 scanner is offered with either magnetic wheels or wheels for composite surfaces. If required for cleaning or replacement, you can remove PaintBrush 2 scanner wheels.



Warning! The PaintBrush 2 scanner uses powerful magnets to maintain firm contact with the inspection surface. These magnets may interfere with bionic or medical devices. Operators with pacemakers, neurostimulators, or metallic implants should take appropriate precautions to avoid potential hazards.

Table 3 Wheelset models

SCAN-SPARE-PB2-WHEELSET	
SCAN-SPARE-PB2-WHEELSET-STRONG	
SCAN-SPARE-PB2-WHEELSET-NONMAG	

To remove the wheels from your scanner:

1. Gather the spanner wrench and Allen key provided in your PaintBrush 2 scanner kit.

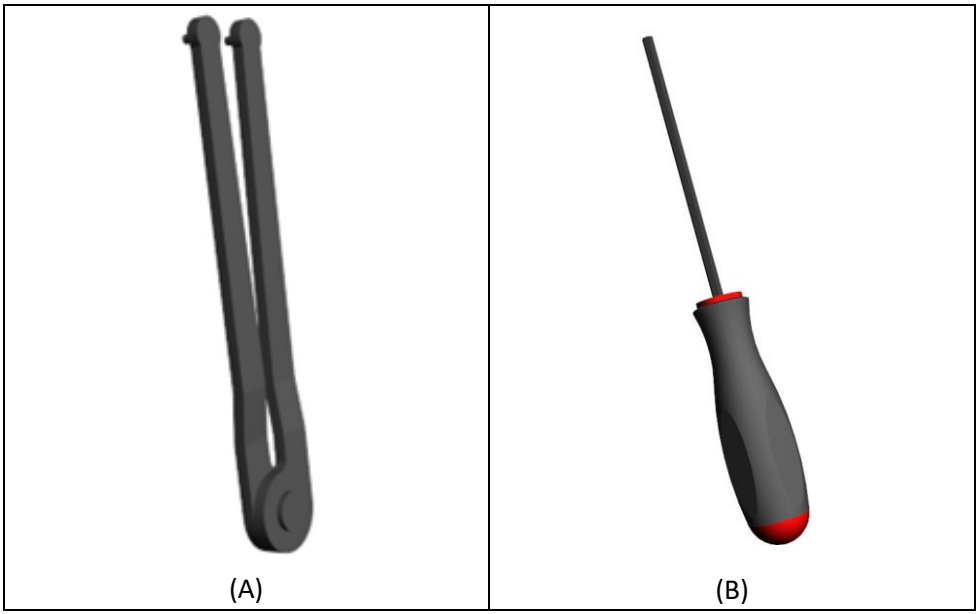


Figure 9 PaintBrush 2 scanner Tools: (A) Spanner Wrench and (B) Allen Key

2. Align the pegs of the spanner wrench with the peg holes of the scanner.
3. Using the Allen key, remove the wheel screw



Figure 10 Wheel removal

4. The wheel can now be easily removed from the scanner axle.

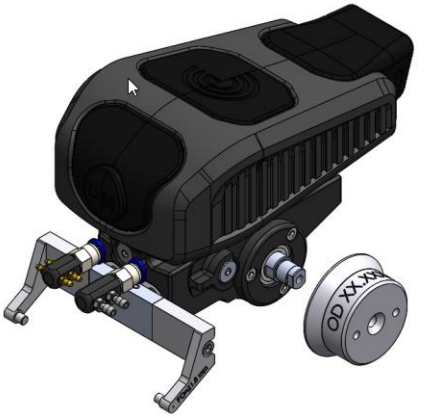


Figure 11 Wheel removed from the scanner

5. Either clean the wheels or obtain a new one.
6. Place the cleaned or new wheel on the scanner axle.
7. Position the spanner wrench on the new wheel (wrench pegs inserted in the wheel peg holes).
8. With the Allen key, replace the screw.

With the new wheel in place, repeat steps 2 to 7 for the second wheel.

9.3 Adjusting Encoder Resolution for New Wheel Diameters in UltraVision

For precise data positioning, the wheel diameter must be correctly configured in UltraVision.

1. Connect the PaintBrush 2.

2. Accept the new scanner detected.

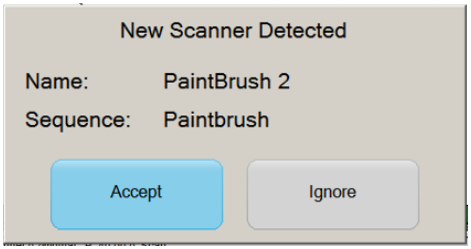


Figure 12 New scanner detected in UltraVision

3. In the **Mechanical** menu: go to the **PaintBrush** sub-menu and select **Calibrate**. The **Calibrate Wheels** window opens.

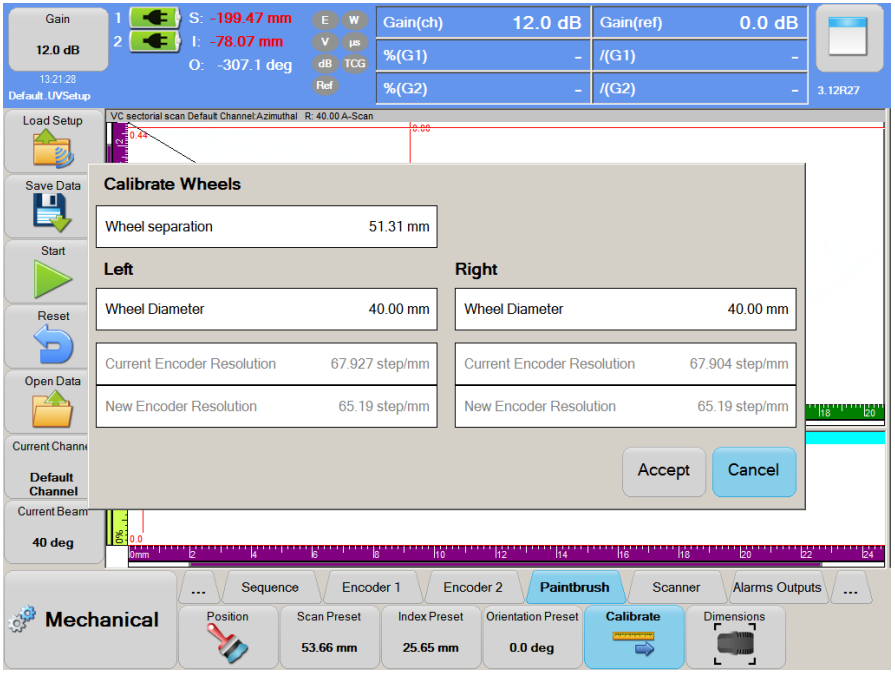


Figure 13 Mechanical menu screen

4. Set the **Wheel Diameter** fields for the **Left** and **Right** wheels.
   The wheel diameter is engraved on the wheels.
   Make sure the wheels' positions are not exchanged.

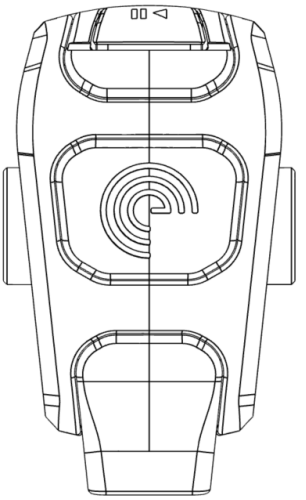
LEFT Wheel  RIGHT wheel

Figure 14 Wheel orientation

5. Set the **Wheel separation** field depending on the wheel type, as follows:

Table 4 Wheel separation

Wheel type	Wheel separation value [mm]
Standard magnetic wheels SCAN-PAINTBRUSH-SPARE-WHEELS	50.8
Strong magnetic wheels ZGN-ACC-PTBR-MAGWHEEL-STRONGER	52.5
Non-magnetic wheels ZGN-ACC-PTBR-NOMAGWHEEL	52.5

6. Select **Accept.**

Wheel parameters are saved in the PaintBrush 2 scanner's memory chip. You do not need to repeat this setup unless the wheels are changed, even if the scanner is disconnected from the instrument.

Chapter 10

Specifications

10 Specifications

You will find in the following pages the specifications of the PaintBrush 2 scanner.

Table 5

Encoder resolution	2048 counts per revolution
Size (W x H x D)	83.6 mm x 95.3 mm x 149.9 mm (3.29 in. x 3.75 in. x 5.90 in.)
Net weight	950g (2.09 lb) without cable
Cable Length	5m (196.85 in.) or 10m (393.70 in.)

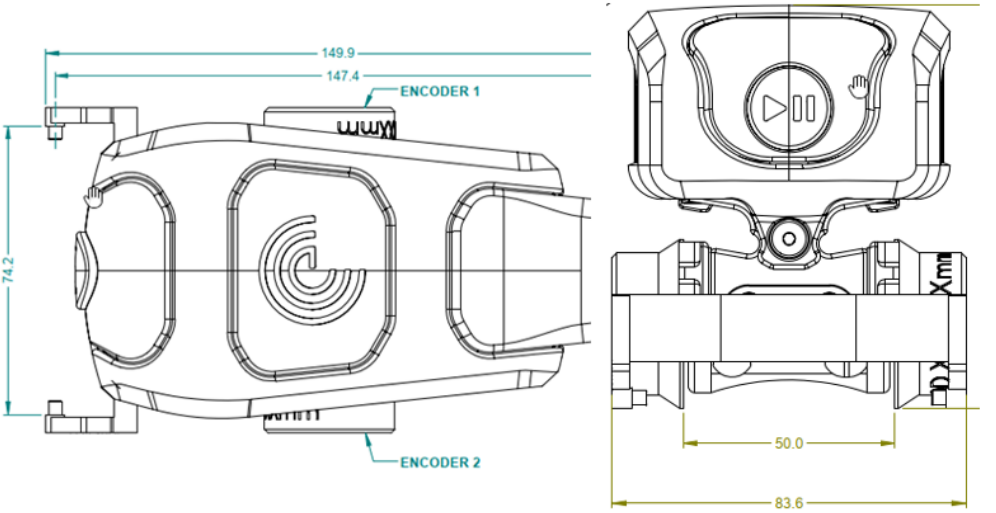


Figure 15 PaintBrush 2 Size. All dimensions in millimeters

Table 6 Operating specifications

Pipe minimum diameter	
Pipe minimum diameter	101.6 mm (4.0 in) Horizontal and vertical
Pipe maximum diameter	48'' (1219.2mm) or Flat surface
Maximum position deviation	±1.4mm/1000.0mm typ.
Environment	
Examination surface temperature	-35°C to 150°C (-4°F to 302°F) ***Note***: Intermittent operation, maximum duration of 25 min. at 150°C (302°F)
Operating temperature	-35°C to 75°C (-4°F to 167°F) with relative humidity up to 95% non-condensing
Environmental conditions	Harsh environments for indoor and outdoor including wet locations
	***Note***: Environmental conditions for instruments used with the PaintBrush 2 must be respected; always refer to their specific user's manual.
Storage temperature	-40°C to 75°C (-40°F to 167°F)
Ingress Protection	Designed for IP65 (pollution degree 2)
Maximum altitude	2000 meters
Other	
Front Button	Pause and restart acquisition
Power supply	+5V ± 10% @ 200 mA
European Conformity	CE compliant

10.1 PaintBrush 2 with DE15 Interface Connector

PaintBrush 2 connector: HD-15, male connector

Caution:

The DE15 connector option is offered to connect with legacy instruments. It is not sealed and is not meant to work in wet locations.

Mating connector on instrument: HD-15, female connector

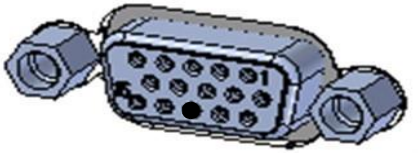


Figure 16 I/O DE15 Interface Connector on the instrument

Table 7 Pin-out for the DE15 I/O interface connector

Pin	I/O	Signal	Name	Current	Type
1	In	---	Acquisition button	---	TTL
2	In	---	---		
3	In	+5V	Input power	200mA	---
4	---	---	---	---	---
5	Out	---	PaintBrush 2 1-wire	---	TTL
6	---	---	---	---	---
7	---	---	---	---	---
8	In	---	PaintBrush 2 1-wire	---	TTL
9	In	ENC 1 A	Right Wheel Encoder 1 Phase A	---	TTL
10	In	ENC 1 B	Right Wheel Encoder 1 Phase B	---	TTL

Pin	I/O	Signal	Name	Current	Type
11	In	ENC 2 A	Left Wheel Encoder 2 Phase A	---	TTL
12	In	ENC 2 B	Left Wheel Encoder 2 Phase B	---	TTL
13	---	---	---	---	---
14	---	---	---	---	---
15	---	Gnd	Ground	---	---

10.2 PaintBrush 2 with LEMO16 Interface Connector

PaintBrush 2 connector: LEMO16, male connector

Mating connector on instrument: LEMO16, female connector



Figure 17 I/O LEMO16 Interface connector on instrument

Table 8 Pin-out for the LEMO16 I/O interface connector

Pin	I/O	Signal	Name	Current	Type
1	In/Out	1-Wire	1-Wire	---	
2	In	+5V	Input power	200mA	
3	---	---	---	---	---
4	In	ACQ_BUTTON	Acquisition button	---	TTL
5	---	---	---	---	---

Pin	I/O	Signal	Name	Current	Type
6	---	---	---	---	---
7	---	---	---	---	---
8	---	---	---	---	---
9	In	PHA axis 1	Right Wheel Encoder Phase A	---	TTL
10	In	PhB axis 1	Right Wheel Encoder Phase B	---	TTL
11	In	PhB axis 2	Left Wheel Encoder Phase B	---	TTL
12	In	PhA axis 2	Left Wheel Encoder Phase A	---	TTL
13	---	---	---	---	---
14	---	---	---	---	---
15	---	---	---	---	---
16	---	Gnd	Ground	---	---

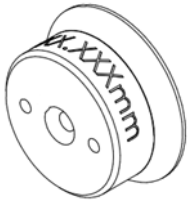
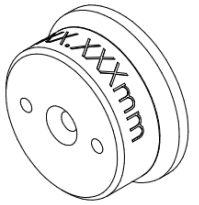
Appendix A

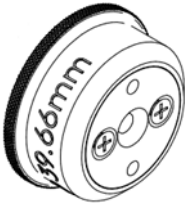
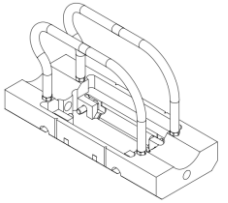
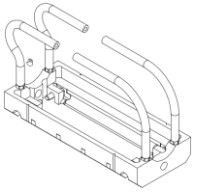
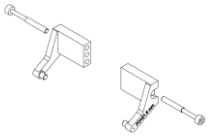
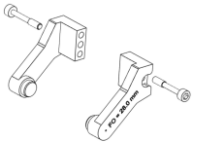
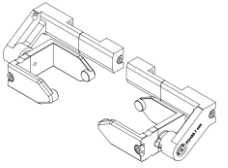
Accessories

Accessories

Eddyfi offers a series of connection adapters and other accessories for the PaintBrush 2 scanner.

Table 9 Accessories

Accessory	Part number	Description
	SCAN-SPARE-PB2-CBLMGMT-5M	Cable sleeving with zipper, 5m
	SCAN-SPARE-PB2-DE15-LE	DE15 to LEMO16 adapter
	SCAN-SPARE-PB2-LE-DE15	LEMO16 to DE15 adapter
	SCAN-SPARE-PB2-WHEELSET	Spare set of replacement standard magnetic wheels for PaintBrush 2 scanner - QTY 2 wheels
	SCAN-SPARE-PB2-WHEELSET-STRONG	Spare set of replacement extra-magnetic strength wheels for PaintBrush 2 scanner - QTY 2 wheels

Accessory	Part number	Description
	SCAN-SPARE-PB2-WHEELSET-NONMAG	Spare set of replacement non-magnetic wheels for all non-magnetic material - compatible with PaintBrush 2 scanner - QTY 2 wheels
	SCAN-ACC-DLA-SHOE-CS	Probe holder for small aperture (24mm x 5mm) 1D-Linear Transmit-Receive PA probe (Side-by-Side configuration) – 4x Irrigation Port - Compatible with corrosion probes CS casing for PaintBrush 2
	SCAN-ACC-DLA-SHOE-CL	Probe holder for large aperture (48mmx5mm) 1D-Linear Transmit-Receive PA probe (Side-by-Side configuration) – 4x Irrigation Port - Compatible with corrosion probes CL casing for PaintBrush 2
	SCAN-SPARE-PB2-DLA-FORK	Pair of toolpost forks for PaintBrush 2 compatible with SCAN-ACC-DLA-SHOE-CS & SCAN-ACC-DLA-SHOE-CL
	SCAN-SPARE-PB2-A11-A12-FORK	Pair of toolpost forks for PaintBrush 2 compatible with WSA11-A12-0L-FLAT-20mm-IHC
	SCAN-SPARE-PB2-NW1-FORK-KIT	Pair of toolpost forks for PaintBrush 2 compatible with WSNW1-0L-FLAT-20mm-IHC

Accessory	Part number	Description
NA	SCAN-SPARE-PB2-5M-IRRIG-KIT	Spare 5M irrigation kit for PaintBrush 2 – Includes 5M water hose, ball valve & connector compatible with SCAN-MANUAL-PUMP-7.9L
NA	SCAN-SPARE-PB2-10M-IRRIG-KIT	Spare 10M irrigation kit for PaintBrush 2 – Includes 10M water hose, ball valve & connector compatible with SCAN-MANUAL-PUMP-7.9L

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