



# **Sonatest WP2 Wheel Probe User Manual**

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# 1 Disclaimers and Notices

The following information must be read and understood by users of the rolling transducer WP2 wheel probe. Failure to follow these instructions can lead to serious errors in test results or damage to the probe. Decisions based on erroneous results can lead to property damage, personal injury, or death. Anyone using this instrument should be fully qualified by their organization in the theory and practice of ultrasonic testing, or under the direct supervision of such a person.

All statements, technical information, and recommendations contained in this manual or any other information supplied by Sonatest concerning the use, features, and qualification of the WP2 are based on tests believed to be reliable. However, the accuracy or completeness of the information is not guaranteed.

Before using the product users should determine its suitability for the intended use based on their knowledge of ultrasonic testing and the characteristic of materials. Users bear all risk in connection with the use of the WP2 wheel probe.

## 1.1 Copyright

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All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of Sonatest Limited.

## 1.2 Warranty

Immediately upon receipt of the goods, the buyer is required to check the goods carefully and thoroughly in order to benefit from the warranty; any defect in the product should be immediately reported in writing to Sonatest. We will make good by repair or by the supply of a replacement or by equivalent adjustment of the price at our sole option defects which under proper use appear in the goods within a period of twelve (12) calendar months after the goods have been delivered and which arise solely from faulty design, material or workmanship. Provided always that the goods are carefully packed and promptly returned by you free to our works unless otherwise arranged. Said goods should be covered while in transit to us and must be accompanied by a written statement detailing the precise nature of the fault and the operating conditions under which the fault occurred. The repaired goods will be returned by us free of charge.

Save as in this clause hereinbefore expressed we shall not be under any liability in respect of defects in goods delivered or for any injury damage or loss resulting from such defects and our liability under this Clause shall be in lieu of any warranty or condition implied by law as to the quality or fitness for any particular purpose of such goods.

You are reminded that all warranties as to merchantability and fitness for purpose are excluded from the contract under which the product and this manual have been supplied to you. The Seller's only obligation in this respect is to replace such quantity of the product proven to be defective.

Neither the seller nor the manufacturer shall be liable either in contract or in tort for any direct or indirect loss or damage (whether for lost of profit or otherwise), costs, expenses or other claims for consequential or indirect compensation whatsoever (and whether caused by the negligence of the company, its employees or agents or otherwise).

Serviceable parts of the WP2 include:

- Replenishment of water within the wheel transducer
- Tyre
- Cables
- Handle bars
- Rollers
- Battery of the remote control

Attempts to service the remaining parts of the WP2 by persons other than Sonatest's personnel or agents will invalidate this warranty.

## 1.3 Equipment Directive Conformance



FCC

### **WARNING!**

This equipment 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 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 instruction manual, may cause harmful interference to radio communications.



Operation of this equipment in a residential area is likely to cause harmful interference in which case the users will be required to correct the interference at their own expense. The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Sonatest Limited Inc.



### **CAUTION**

Risk of important damage if the battery is replaced with an incorrect type.  
Dispose of the used batteries according to the instructions.

This product conforms to the following European directives:



CE Marking 93/68/EEC

2004/108/EC (EMC) on electromagnetic compatibility directive

2002/95/EC (ROHS) on Restriction of the use of certain hazardous substances in electrical and electronic equipment

2002/96/EC (WEEE) on Waste Electrical and Electronic Equipment

### **English version**

This device complies with FCC Part 15 and Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with Health Canada's Safety Code. The installer of this device should ensure that RF radiation is not emitted in excess of the Health Canada's requirement.

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

### **Version française**

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil est conforme avec Santé Canada Code de sécurité 6. Le programme d'installation de cet appareil doit assurer que les rayonnements RF ne sont pas émis au-delà de l'exigence de Santé Canada.

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« Les changements ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'autorité de l'utilisateur à utiliser cet équipement. »





## 2 Introduction

This manual provides information for the WP2 wheel probe. The information contained herein allows usage of the WP2 to its full potential. It has been designed considering that users already have a good knowledge of basic ultrasonic non-destructive testing. It is important that users understand the critical nature of ultrasonic non-destructive testing before operating this instrument.

The user manual contains procedure on how to use the WP2, how to care for it, and explains the functionalities and parameters when used with one of Sonatest advanced products.



Figure 2-1 Sonatest WP2 wheel probe

### 2.1 WP2 Compatibility

The following lists the instrument compatible with the WP2 wheel probe.

- Sonatest **veo**
- Sonatest Prisma
- Sonatest RapidScan2
- Olympus OmniScan (MX, MX2, SX)
- Most PA/UT instruments on the market

For other instruments, contact the Sonatest Customer Service for a compatibility evaluation.

### 2.2 Connection and Remote Control Compatibility

The following lists the connections and test instruments compatible with the WP2 wheel probe and its remote control.

- Phased Array connectors and I/Os

- I-PEX
- ITT Canon
- Hypertronix

For other connectors, contact the Sonatest Customer Service for a compatibility evaluation.

- Remote control
  - Sonatest **veo**
  - Sonatest Prisma
  - Olympus OmniScan (MX, MX2, SX)

## 2.3 Operator Requirements

Operators must receive adequate training before using the WP2. They must be trained in general ultrasound testing procedures and in the setup and performance required by the specific tests or inspections. Operators must have experience and be qualified to use standard ultrasound flaw detection equipment and they must understand the sound wave propagation theory:

- Effects of the velocity of sound in the material under test.
- Behavior of the sound wave at the interface of two different materials, the spread of the sound wave, and the mode conversion.
- Operation and triggering of gates for C-scan views.
- Formation of the sound beam for the phased array technique.

More specific information about operator training, qualification, certification, and test specifications can be obtained from technical societies, industry groups, and government agencies.

## 2.4 Operating Conditions

This section presents the conditions that should be respected for operating and storing the WP2.

Operating temperature	-10 to 50 °C
Storage temperature	10 to 50 °C
Maximum relative humidity	95%
IP rating	IP40 (unprotected against ingress of dust and particles or moisture)
Supply voltage fluctuation	±10% of the nominal voltage supply
Maximum repetition pulse frequency	20,000 Hz

## 3 Product Overview

This chapter presents the components of the WP2 wheel probe and its cable and roller options. There is also a presentation of the remote control, and the transportation case and standard accessories. The overview includes a description of the indication LEDs and optional kits.

### 3.1 Components

Figure 3-1 presents the components of the WP2 wheel probe.

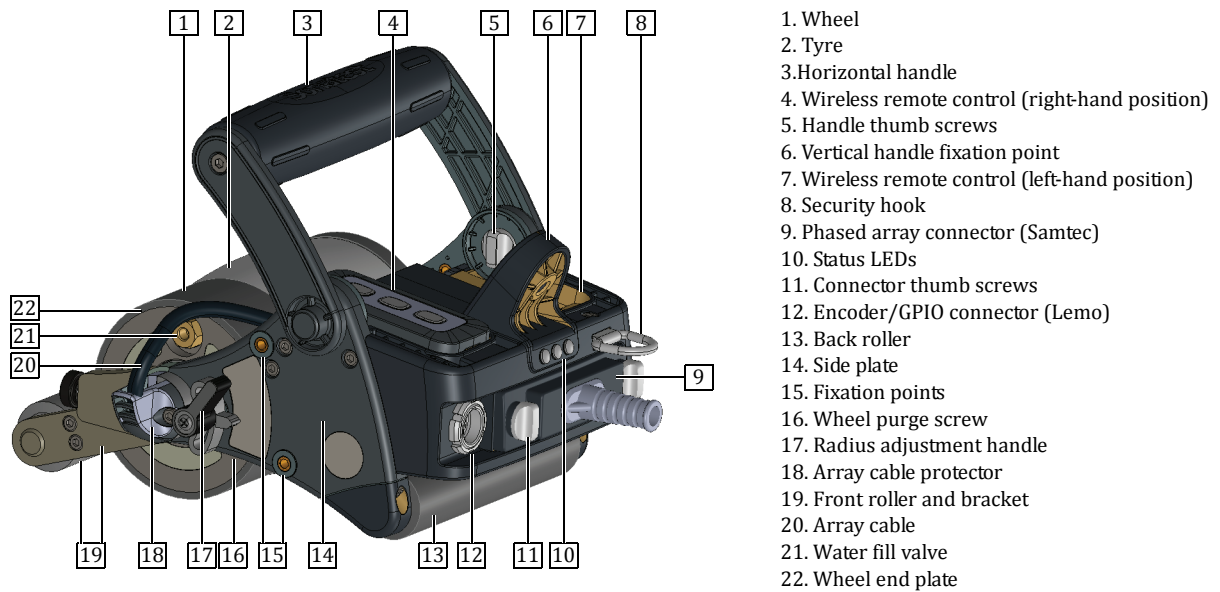


Figure 3-1 Sonatest WP2 wheel probe

### 3.2 Handles

The WP2 offers two types of handles which offer an angular adjustment to fit every operator preference as well as most types of scanning requirements.



The horizontal handle can be used over flat surfaces as well as vertical walls or upside-down configurations.

Its compact design makes it the perfect configuration to match scans around small radius of curvature surfaces as well as a good general purpose handle for restricted area.



The vertical handle is the perfect match for raster scan along flat or slightly curved surfaces.

**Figure 3-2 Horizontal handle (left), vertical handle (right)**

### 3.3 Cable Options and Connectors

This section presents the options available for the cable that connects the WP2 wheel probe to compatible test instruments.



**Figure 3-3 WP2 cable**

The cable is detachable to ease and reduce the cost of maintenance. The cable comes in two standard lengths of 2.5 m and 5 m; however, a custom length can be manufactured to meet customers' requirements.

At the WP2 extremity of the cable, there are two possible connectors:

- Samtec BSH connector (64 phased array elements)
- 8-pin Lemo connector (encoder signals, control signals, gate alarm signals, and record state signal)

At the test instrument extremity of the cable, the I/O and phased array connectors are as follows:

- To support Sonatest **veo** and Prisma devices, the cable comes equipped with:
    - I-PEX connector (64 phased array elements)
    - 8-pin, 1-key Lemo connector (encoder signals)
    - 8-pin, 2-key Lemo connector (device state signals and control signals)
  - To support Olympus OmniScan MX, MX2, and SX, the cable comes equipped with:
    - I-PEX connector (64 phased array elements)
    - 16-pin Lemo connector (MX2) or 15-pin D-sub connector (MX) (encoder and control signals)
    - 8-pin, 2-key Lemo connector (for device status such as alarms)
  - To support other devices, the I-PEX connector used for the 64 phased array elements can be replaced with the following connectors:
    - ITT Cannon connector (RapidScan2 compatibility)
    - Hypertronics connector
- Remark: The cable adapted for other instruments may not support all wireless remote controls and WP2 status LEDs.

### 3.4 Roller Options

Three roller types are available for the front and back rollers of the WP2. Rollers can be of the same type or different types for the front and the back.

The roller types are:

- Flat
- V
- Precision

These rollers are included in the following packages:

- Corrosion inspection package
- Composite inspection package
- Corrosion advanced inspection kit
- Composite advanced inspection kit

#### Flat

The flat roller greatly stabilise the probe to help track a straight scan pattern over a flat surface. It can be used only at the back of the probe for a light-weight configuration or at both ends of the probe to optimize the scan coverage near the part edges.

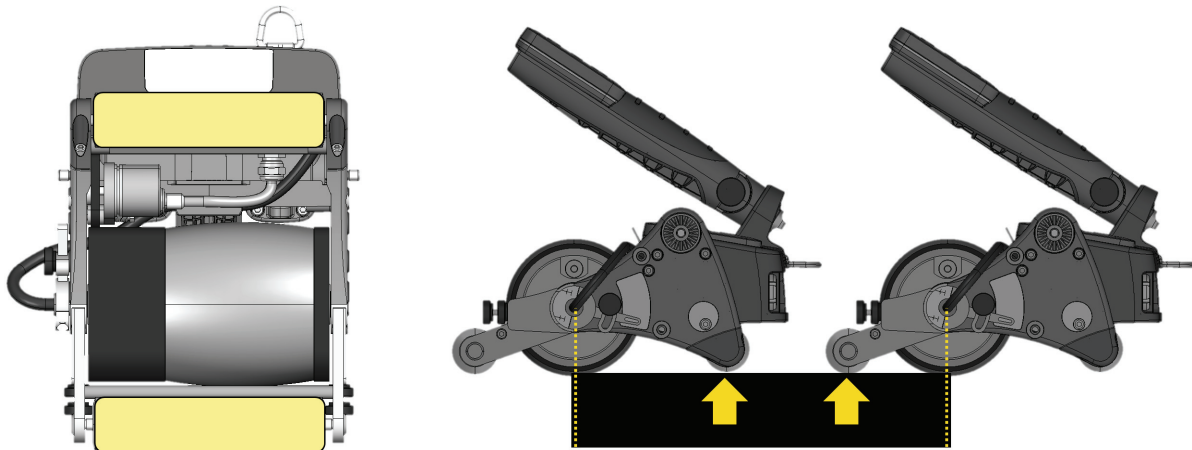


Figure 3-4 Flat roller

## V

The V roller has a provides a V shape that allows the user to perfectly center the middle of WP2 with the center line of a pipe (or cylinder) axial axis. This configuration is perfect to perform axial scans along the length of a pipe to help the user keep the optimal pressure on the tyre and obtain consistent results.

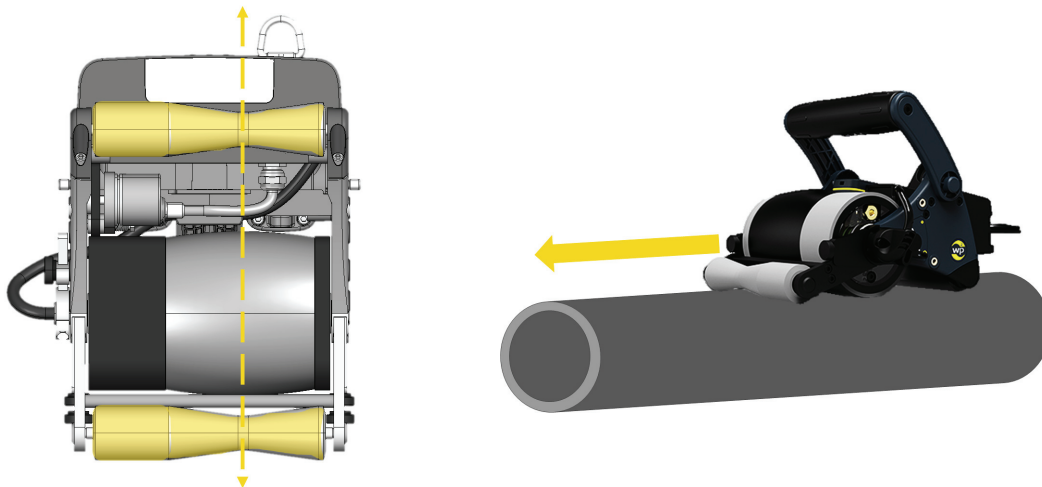


Figure 3-5 V-shape roller

## Precision

The precision roller is a dual-wheel roller that offers a light configuration to help users perform scans over small shape variations of a flat surface (such as an outside weld scarf geometry). It also eases the action to steer the probe to follow a slightly curved scan pattern over a flat surface. It can be used only at the back of the probe for a light-weight configuration or at both ends of the probe.

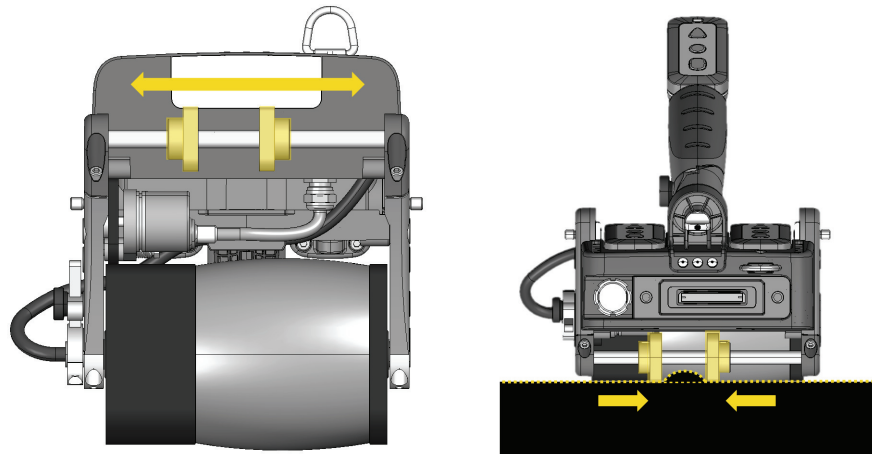


Figure 3-6 Precision roller

## 3.5 Wireless Remote Control

The wireless remote control, located on the WP2, is used to transmit scan commands to the test instrument from a distance of up to 10 m.

It can be set and locked in various positions to match any handle configuration and to accommodate the right- or left-handed users.



Figure 3-7 Positions of the remote control on the WP2

The remote control is powered by a small user-replaceable 20 mm CR2032 coin cell battery and provides the following functionalities:

- Button 1: Record/Stop
- Button 2: Next index
- Button 3: Encoder position reset

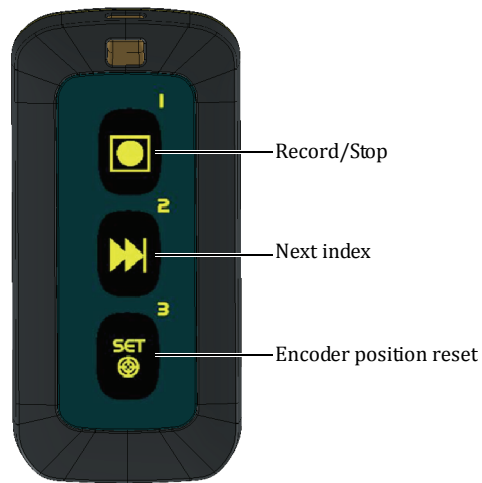


Figure 3-8 Functions available from the remote control

### 3.6 Status LEDs

There are 3 status LEDs located at the back of the WP2 wheel probe. They provide indications in real time allowing users to concentrate on the scanning process without taking their eyes away from the part.

The LEDs information are pre-programmed in Sonatest **veo** and Prisma test instruments.

LED Position	LED Color	WP2 Signal Information	veo/Prisma Pinout <sup>1</sup>
Left	Red	Gate alarm 1	Pin 2
Middle	Yellow	Gate alarm 2	Pin 3
Right	Green	Record status	Pin 4

1. 8-pin, 2-key Lemo connector on **veo**/Prisma





Figure 3-9 LEDs at the back of the WP2

## 3.7 Transportation Case and Standard Accessories

Whether you select the corrosion or composite inspection package, the standard accessories delivered with the WP2 are the following:

- Rugged transportation case
- User Manual
- Tools to assemble/disassemble the WP2
- Water filling equipment
- Spray bottle

## 3.8 Laser Guidance Kit

A laser guidance kit is available as an accessory option to help users perform a straight scan without deviating from the intended scan path. The kit attaches to the fixation points located on both side plates of the WP2.

The laser guidance kit includes the laser, two sets of batteries, and the laser brackets.

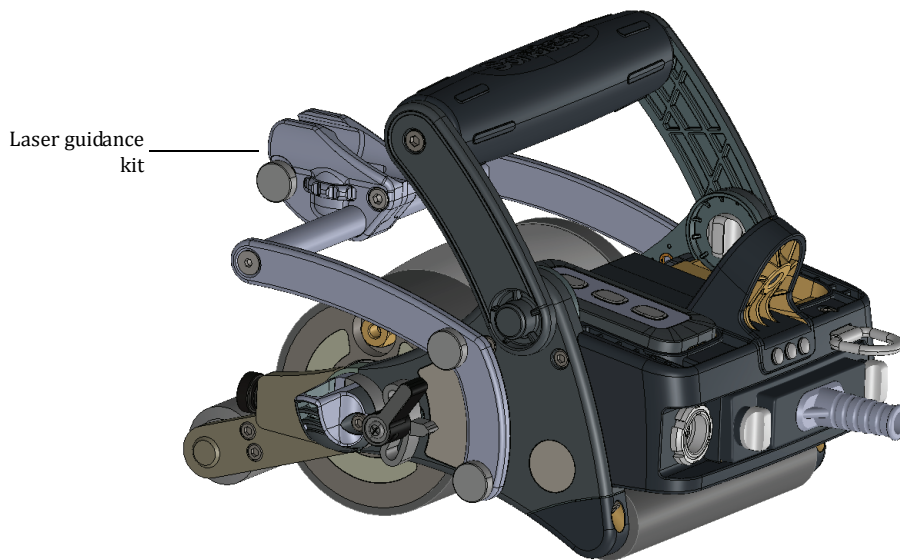


Figure 3-10 Laser guidance kit mounted on the WP2

### 3.9 Remote Display Kit

A remote display kit is available as an accessory option to attach a smartphone to the WP2.

The smartphone can be used as a display monitor when connected to a **veo** or a Prisma through a VNC server.

This kit includes the phone holder, that mounts on the vertical handle in the same place as one would mount the wireless remote control, and a mini Wi-Fi router.

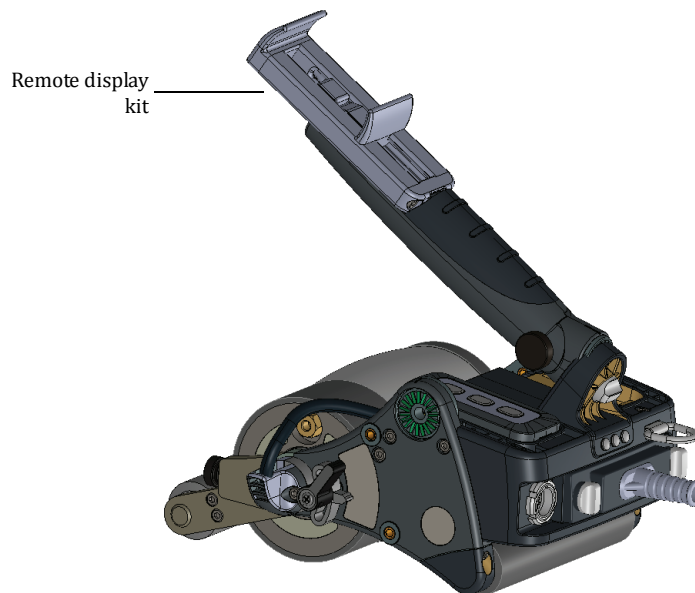


Figure 3-11 Remote display kit mounted on the WP2

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## 4 Setting up the WP2

This section presents the procedures to...

**Figure 4-1 Sonatest WP2 wheel probe**

