inductosense

WAND Data Collector
User Manual

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How to use this manual

The WAND Data Collector (referred to as WAND from this point forward) manual has been laid out to reflect the menu bar that appears on the WAND screen.

This booklet includes:

Measure	Measure Settings	Device Settings	History
Page 7 How to take thickness measurements	Page 10 Configuring the WAND for a measurement	Page 12 Configuring WAND for use	Page 14 Retrieving stored data

Other instruction manuals in the WAND series:

WAND IDM Software Manual
WAND TMS - Sensor Installation Manual

Introduction

The WAND is used to activate the Inductosense Thickness Monitoring Sensors (TMS) in order to take ultrasonic thickness measurements from structures. The WAND powers and subsequently acquires the thickness data from the installed sensors. The TMS sensors can be installed on thickness/corrosion monitoring locations (CMLs/TMLs). Measurements from the TMS sensors are displayed on the WAND's screen and can also be analysed using the Inductosense Data Management (IDM) software.
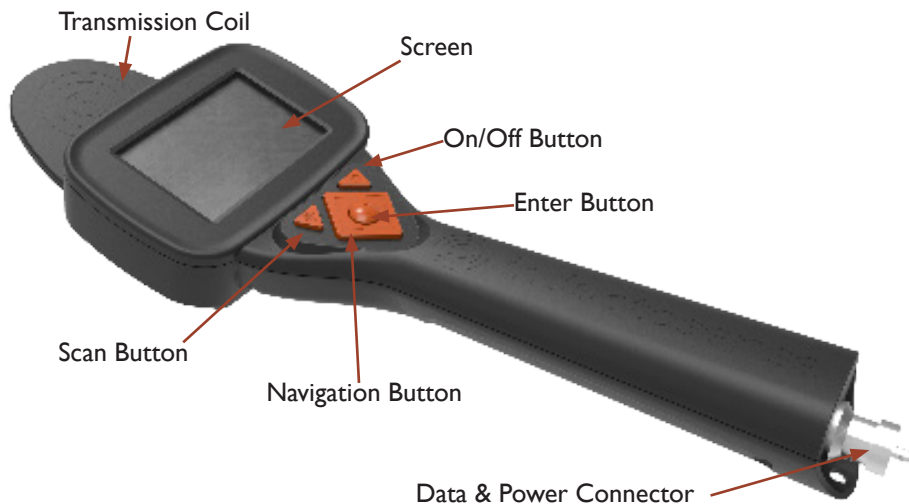
Description of Key Features

Figure 1: The Key Features of the WAND Data Collector

Powering-up the WAND

To switch the WAND on press the ON/OFF button. Once the WAND is turned on, a user sign-in page will be displayed. A user can sign-in to the device by either scanning a user RFID card or by entering a PIN Number against a specified user name.

- When using an RFID card, simply hold the card under the WAND and depress the scan button.
- With a USER ID and PASSWORD, press the enter button to reveal a list of recorded users..
- Navigate to the appropriate user using the navigation buttons and select by pressing the ENTER button.
- Navigate to the PIN field and press the Enter Button
- Enter the 4-digit PIN number by scolling throught the numbers (up and down buttons) and move to the next number using the left and right buttons.
- Once the PIN has been entered press the enter button
- If the PIN number entered is succesful the screen will change to the MEASUREMENT screen
- If the PIN number is incorrect an 'Error' message will appear.
- Clear the error message by pressing the enter button and retry the PIN.
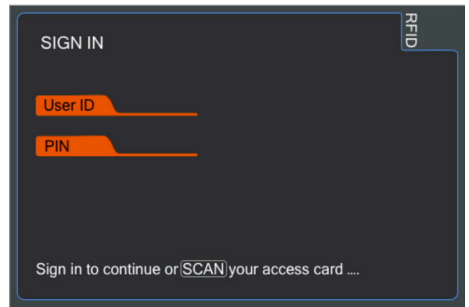

Figure 2: The Sign-in Screen

Start using the WAND

Prior to initial use of the WAND, it is recommended to check and confirm the MEASUREMENT and the DEVICE SETTINGS. The settings are accesed via the Menu Bar.

To open the Menu Bar, press the UP navigation button.

The LEFT and RIGHT arrows can be used to move between the four measurement options (see Figure 3 below) and the Enter button will select the required option.

To exit the menu press the scan button

| Measure | Measure Settings | Device Settings | History |

Figure 3: The device navigation Menu can be opened using the UP button from any screen after login is completed successfully.

The Measurement Screen (Figure 4 below) is used to display the ultrasonic A-scan, the location of the TMS sensor and the the velocity of ultrasound in the material and the calculated thickness.
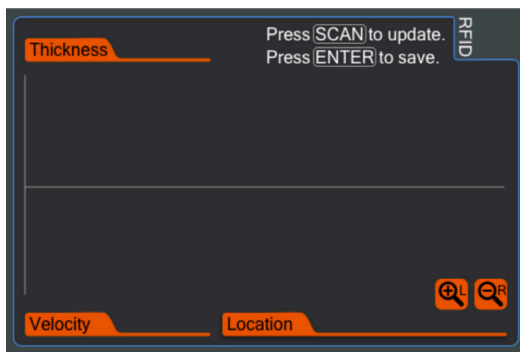

Figure 4: The Measurement Screen

Tip:

When the scan button is depressed a reduced ultrasonic A-scan is displayed alongside a bar showing the signal to noise ratio. This feature is designed to enable users to achieve optimal alignment of the WAND to the TMS sensor.

When the scan button is released the full ultrasonic signal is shown on the screen along with location from the RFID. This signal is the average of the scans taken while the scan button was held down (if Averaging is ENABLED) or the last reading (is Averaging is DISABLED). For more on Averaging, see Measurement Settings.

Acquiring measurements using the WAND and Assigning RFIDs to TMS Sensors in the field

STEP ONE

Place the WAND above the RFID, press the Scan button. If the RFID has been detected, the location indicator displays the RFID tag ("RFID / N/A" if the RFID has not been assigned, "RFID / name of location" if it has been). Otherwise, the location indicator will display "N/A" only. In that case, release the button, reposition the probe and press the button again.

STEP TWO

Once the RFID is acquired, keep the scan button pressed down. For the best signal, the transmission coil on the probe should be positioned above the sensor. The ultrasonic signal should appear in the measurement window, and the colour bar on to the right of the scan showing signal to noise ratio should be high. Once the probe is in a position in which the signal appears, and the signal intensity is high, release the scan button. If the message "too close" appears, increase the distance from the probe to the sensor slightly.

STEP THREE

Save the measurement by pressing the enter button. If the RFID has already been assigned, you will see a save confirmation message. Press the enter button again to go back to the measure screen. If the sensor history has been ENABLED (See MEASUREMENT SETTINGS) you will automatically see a screen showing a list of that sensor's previous measurements

STEP FOUR

If the RFID has not been assigned previously (in the IDM software, and then imported to the probe, or directly in the field), a window will open to assign it in the field. The window allows the user to define the material, calibration value (manual UT reading), and location name associated with the RFID. The settings are selected using up and down on the

navigation pad and the enter button.

STEP FIVE
Select a standard material in the list or enter a new custom material velocity.

STEP SIX
If available, enter the reference manual UT measurement in the Cal. Value setting (Press enter to set the Cal. Value setting, then use up and down to change digits, left and right to cycle through the digits, press enter when done).   This value cannot be set to 0. If there is no reference value, set to another value and make a note of this. It can be changed later in the IDM software.

STEP SEVEN
Enter a location name. This can be changed later in the IDM software if mistakes are made, or if location names are simplified due to the input method.

STEP EIGHT
Once the settings for the RFID have been set, press the left navigation button to finish the RFID assignment and save the measurement.

Subsequent measurements taken by the WAND will associate all data from the TMS senso to this RFID.

The 'Measure Settings' menu options allows users to define the measurement parameters against which the thickness measurements will be recorded in the WAND.

Figure 5 is a screenshot of this menu option and displays the criteria that can be configured. It should be noted that Material and Peak Detction can also be applied in retrospect to the individual (and groups of) measurements once they have been uploaded to the IDM software.

Figure 5:   Measure settings screen

Use the UP and DOWN buttons to navigate between the criteria and the ENTER button to select. Within each criteria, use the UP and DOWN buttons to navigate between the options and the ENTER button to select.

Press the scan button to return to the measurement screen.

The Measurement Settings Criteria

Waveform
There are three options for displaying the waveform. These are RAW, ENVELOPE and BOTH

Material
Select from the standard velocities pre-installed in the WAND. New velocities can be entered either directly into the WAND or via the IDM software.

Peak detection
The ultrasonic thickness can be calculated from the A-scan using either the first peak or a measurement between two peaks (peak-to-peak).

Sensor history
Enabling this option will display the history table for each TMS sensor when a thickness reading is saved.

Averaging
Averaging can be DISABLED or ENABLED. When ENABLED, the WAND will average over 8 measurements per second when the scan button is depressed. The thickness measurement displayed will be the average of all measurements taken with the scan button depressed.

Minimum thickness
A minumum thickness value can be set. The WAND will then not calculate any thickness values below that threshold. This is recommended for structures >50mm

The 'Device Settings' menu options allows users to configure operating parameters of the WAND.

Figure 6 is a screenshot of this menu option and displays the criteria that can be configured. There are two columns of options. Only the left hand column can be configured; the right hand column displays fixed device settings.
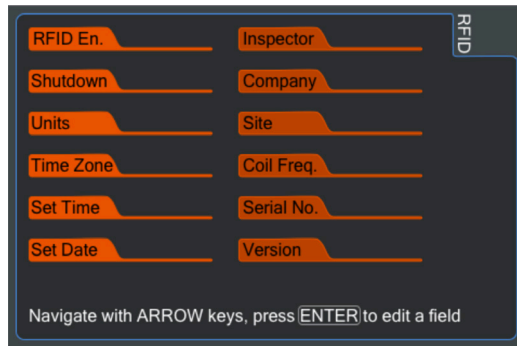

Figure 6: Device settings screen

Use the UP and DOWN buttons to navigate between the criteria and the ENTER button to select. Within each criteria, use the UP and DOWN buttons to navigate between the options and the ENTER button to select.

Press the scan button to return to the measurement screen.

Configurable Device Settings

RFID En.
The RFID functionality can be ENABLED or DISABLED.

Shutdown:
This can be used to set the inactivity time after which the device will shut down. To optimise battery life it is recommended not to set the inactivity time to 'never'.

Units:
METRIC or IMPERIAL units can be selected.

Time zone:
The user can select the desired time zone for the location.

Set Time:
The time on the probe can be changed (24 hour-minute-second).

Set Date:
The date can be edited (Day/Month/Year).

The History screen can be used to display the last 5 A-scans.

Use the UP and DOWN buttons to navigate between the records and the ENTER button to select. The A-scan will be displayed along with the calculated thickness and location.

With the A-scan displayed, the LEFT and RIGHT buttons will zoom in and out respectively.

To select another record, return to the HISTORY screen via the Menu Bar and repeat the steps above.

If there are other thickness measurements from the same TMS sensor stored on the WAND these can be viewed by pressing enter.

FCC Compliance Statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: 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 user will be required to correct the interference at his own expense must only be used in industrial environments and not residential ones.

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