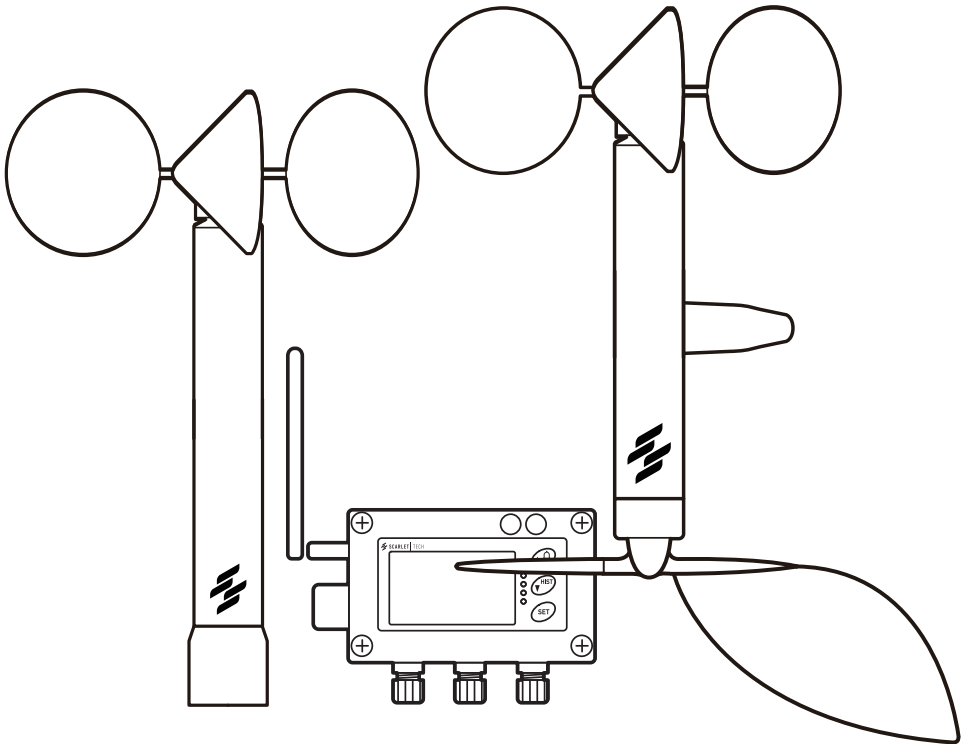




SCARLET | TECH



# WL-410 Series

Wireless  
Wind Monitoring System

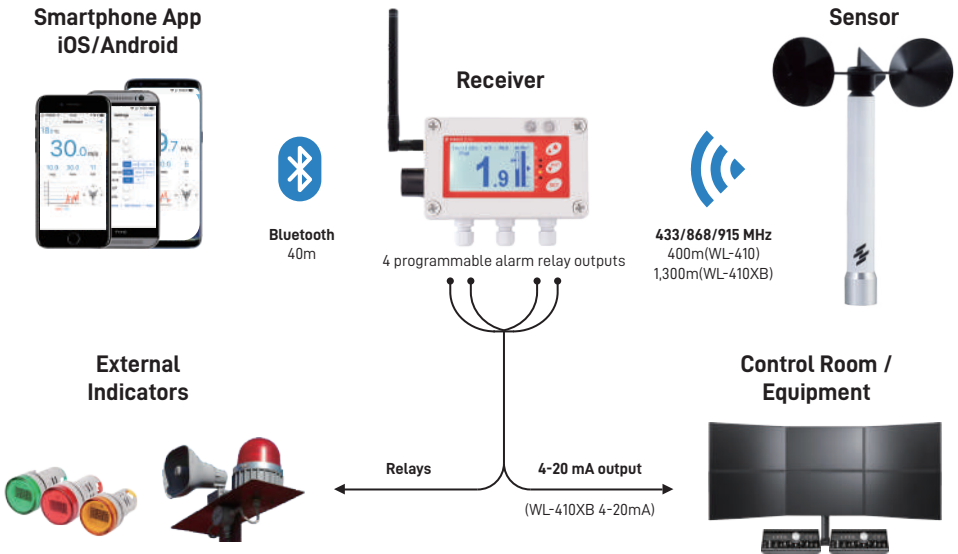
## User Guide

# Instrument at a Glance

## Overview

WL-410 Wireless Wind Alarm System consists of a wind speed sensor and a receiver. The sensor measures wind speed and transmits data to the receiver. The 3.5-inch LCD display of receiver shows readings on the main page and the history graphs are shown in different pages. According to the preset values, the receiver can trigger local alarms such as LED lights and buzzer, or trigger external indication via 4 built-in relays when measured wind speeds exceeding the thresholds.

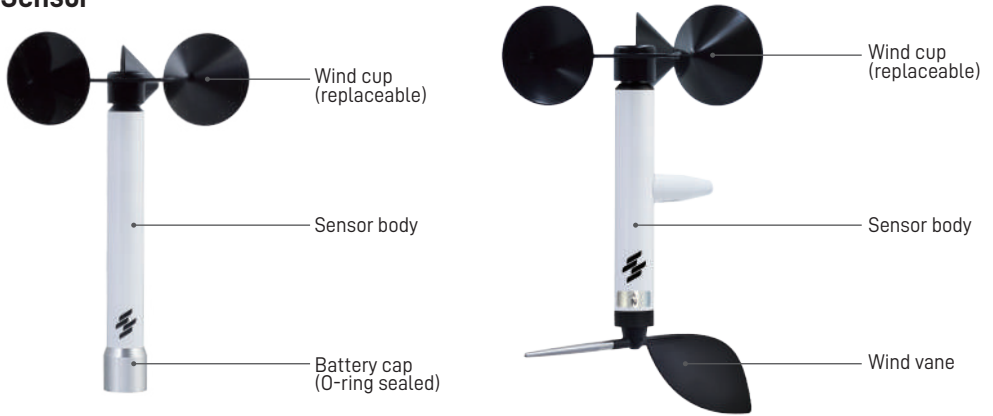
A 868 MHz radio frequency module is installed in the receiver. In WL-410XB model, an additional Bluetooth Low Energy chip is installed to enable smartphone communication functionality. WL-410XB sensor output power is stronger (+14 dBm) than WL-410, allowing a longer transmission distance. An optional 4-20 mA current loop module is available to WL-410XB for long distance cable transmission.



# Sensor & Receiver

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## Sensor



Sensor unit switches ON automatically when the anemometer cups revolve. It switches OFF 6 hours after the anemometer cups stop revolving. In ON state, the sensor updates wind speed data every two seconds.

## Address

The correspondent sensor address has been preset at the factory. Always set the address correspond to the address of the sensor from which the receiver will receive data. Address of the sensor is indicated on the sensor label and in the interior of sensor battery compartment.

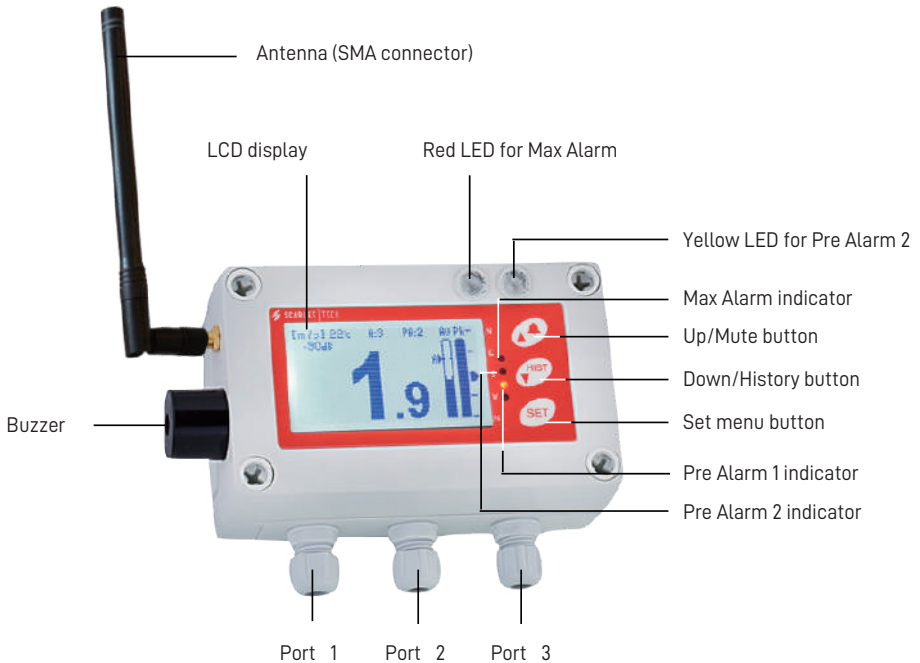
## Range

Connection between sensor and receiver goes through free 868 MHz band (optionally 908MHz). Transmission range is up to 500 meters (1300 meters at models XB) - at 10 m sensor mounting height and when there is no obstacle between the sensor and the display unit. Inside buildings the range is much shorter. Normally the signal can be received through two to three walls.

## Power

When the "Lo battery" appears on the display, replace the sensor battery. Take off the battery cover (on the bottom) by turning it anti clockwise. Pull out the battery holder and insert new battery (Lithium 3.6 V AA).

# Receiver



Select the position where the signal reception is strong enough under all conditions. Connect the enclosed antenna to the SMA connector on the display unit only when the power supply is switched OFF.

## Signal Reception

The reception symbol blinks when the display unit receives a signal from the sensor (every 2 seconds if the reception is good). Signal strength is numerically shown in dB:

- 105 dB is approximately the limit where display unit stops receiving
- 100 dB and lower means very weak signal
- 95 ... -90 dB is considered as still acceptable
- 85 dB and higher is a good signal

When the sensor doesn't send data (in the OFF state) or when the signal is lost for a more than 30 seconds, the "No data" notification appears on the display, indicating that the receiver doesn't receive data from the sensor (sensor OFF or out of range).

## Alarm

The threshold wind speed of Pre Alarm 1, Pre Alarm 2 and Max Alarm can be configured via setting menus. Please see the section "Settings" for more details.

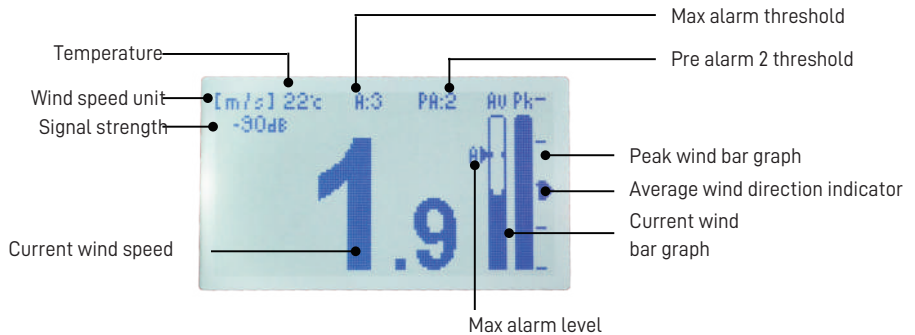
By holding-down the upper key for 2 seconds you can switch the sound alarm ON and OFF. The sound alarm is active each time the display unit is turned ON. In the settings menu, the sound alarm can be disabled permanently.

# Display

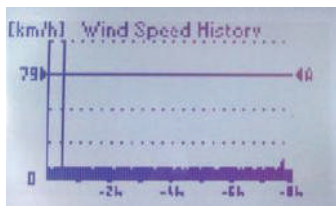
Scarlet WL-410 display consists of 3 pages including: wind speed readings (page 1), wind speed history graphs (page 2), and maximum alarm history graphs (page 3).

By pressing HIST key to navigate to page 2 and 3 for the wind speed and max alarm history graphs. To switch back to the first page user can long pressing HIST key for 3 seconds or inactive for 1 minute.

## First Page

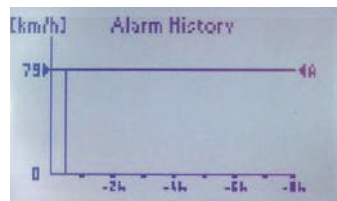


The contents of display are shown above. Note: in both bar graphs, the max alarm value set by user is always on the 3/4 bar height. One icon not shown in the photo is data packet receiving indicator and it flashes by the side the signal strength.



**Second Page**

8 hours peak wind speed history graph, each column presents peak wind speed during the 5 minutes intervals

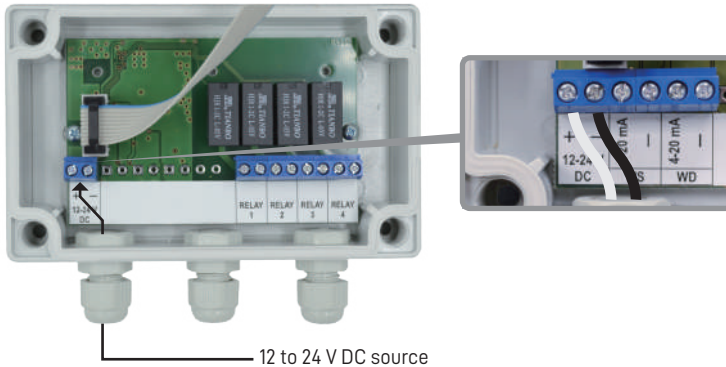


**Third Page**

8 hours Maximum alarm history graph with 5 minutes intervals.

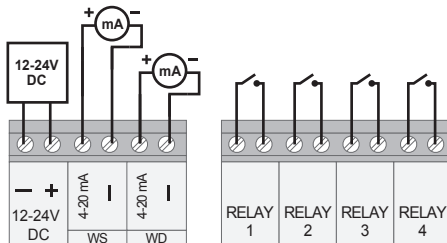
# Wirings

Please switch off the power before unscrew all 4 plastic screws and remove the front panel



The working voltage of receiver is 12 to 24 V DC. Please plug the power adapter or your own DC power source to the corresponding jack on the circuit board after opening the front panel.

**NOTE:** Please make sure the polarity is correct otherwise the receiver will be damaged.



WL-410 XB/4-20mA rear panel wiring connection

## Relays for External Alarm Devices

For using relays, connect the connection terminals to external devices.

RELAY 1: When set value exceed the relay 1 will activate, red light will flash and buzzer will continuously sound.

RELAY 2: When wind speed exceeds the value set on pre alarm 2, the relay 2 will activate and yellow light will start blinking and buzzer will sound with interruptions.

RELAY 3: When wind speed exceeds the value set on pre alarm 1, the relay 3 will activate. Please see section "Settings" for more details.

RELAY 4: Set for alerting that the receiver has no data from the sensor or as 2-zone wind direction alarm.

## 4-20mA Industrial Outputs (WL410 XB/4-20mA only)

For using 4-20mA outputs, please connect the wind speed and/or wind direction connection terminals to external devices.

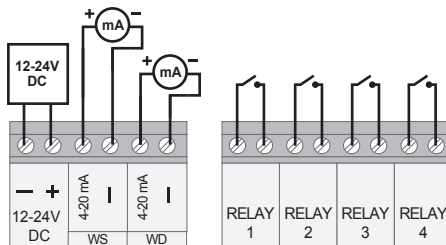
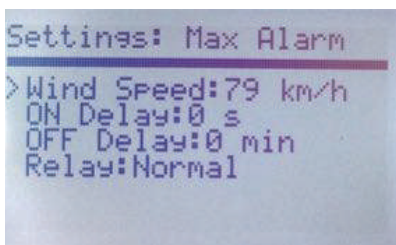
# Settings

## Settings Procedure

1. Hold the SET key to enter the settings menu. If password protection is active, enter the correct password. The group of settings displays on the display.
2. Select the group by using the up and down keys and press the SET key to view the selected group.
3. Using the up and down keys select the parameter you wish to adjust and press the SET key to view the selected parameter. The adjustable parameter blinks.
4. With the up and down keys, adjust the parameter value. Press SET to enter the new value and move to the next parameter.
5. Exiting the settings menu: hold down the SET key to move back one level. The anemometer also returns to the main screen after 2 minutes of inactivity.

## Settings List

Max Alarm	Relay 1, RED ALARM LIGHT	select to set Max Alarm parameters
Pre Alarm 2	Relay 2, YELOW ALARM LIGHT	select to set Pre Alarm 2 parameters
Pre Alarm 1	Relay 3	select to set Pre Alarm 1 parameters
No Signal/WD alarm	Relay 4	select to set No Signal / Wind Direction alarm parameters
General		select to set general parameters



Settings: Max Alarm (Relay 1, RED ALARM LIGHT, continuous sound)

	Factory preset:	Setting range:	Description:
Wind Speed:	72 km/h	1 - 50 m/s	Max Alarm limit
ON Delay:	0 s	0 - 600 s	Minimum time for excess wind speed to activate the Max alarm
OFF Delay:	0 min	0 - 60 min	Alarm switch OFF delay after wind speed drops below preset level
Relay:	Normal	Normal/Inverted	Inverted operation of relay

Settings: Pre Alarm 2 (Relay 2, YELOW ALARM LIGHT, interrupted sound)

	Factory preset:	Setting range:	Description:
Wind Speed:	52 km/h	1 - 50 m/s	Pre Alarm 2 limit
ON Delay:	0 s	0 - 600 s	Minimum time of exceed Wind speed to activate the Pre Alarm 2
OFF Delay:	0 min	0 - 60 min	Alarm switch OFF delay after wind speed drop below preset level
Relay:	Normal	Normal/Inverted	Inverted operation of relay

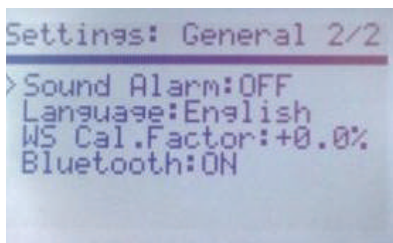
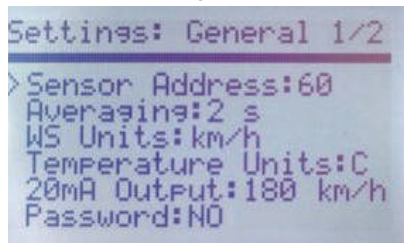
Settings: Pre Alarm 1 (Relay 3)

	Factory preset:	Setting range:	Description:
Wind Speed:	42 km/h	1 - 50 m/s	Pre Alarm 1 limit
ON Delay:	0 s	0 - 600 s	Minimum time of exceed Wind speed to activate the Pre Alarm 1
OFF Delay:	0 min	0 - 60 min	Alarm switch OFF delay after wind speed drop below preset level
Relay:	Normal	Normal/Inverted	Inverted operation of relay

Settings: No Signal / Wind Direction Alarm (Relay 4)

	Factory preset:	Setting range:	Description:
Alarm:	No Signal	No Signal / Direction	Type of Alarm: No signal alarm or wind direction alarm
Relay:	Normal	Normal/Inverted	Inverted operation of relay
Zone1:	315°-45°	0°-359°	Zone of wind direction alarm ON
Zone2:	135°-225°	0°-359°	Zone of wind direction alarm ON
ON Delay:	0 s	0 - 600 s	Minimum time of wind direction inside the alarm zone to activate the alarm
OFF Delay:	0 min	0 - 60 min	Alarm switch OFF delay after wind direction leaves the alarm zone

## General Settings



	Factory Default	Settable Range	Description
Sensor address	Enclosed sensor	1..255	Set the sensor address of your Wind speed sensor
Averaging period	2 sec	2/10/30 sec	Averaging period for showed wind speed
Wind speed unit	km/h	m/s, km/h, mph,knots	Unit of displaying wind speed
Temperature unit	° C	° C or ° F	Unit of displaying Temperature
20 mA output	180 km/h	10...50 m/s	Wind speed at 20 mA output 4mA = 0 km/h 20 mA = seted value wind speed * applicable only at model with additional 4-20 mA output
Password	No	No Yes:0000...9999	Activation of password protection and setting of password
Sound alarm	On	On/Off	Switching sound alarm ON and OFF
Language	English	English/French	Language selection
Wind speed calibration factor	+0.0%		Calibration factor for wind speed(-15,0 ...+15,0% in 0,5% steps)
Bluetooth	On	On/Off	Power ON/OFF Bluetooth transmitter * applicable only at WSM W410XB model

## Reset of Display Unit

With upper button pressed at power ON, RESET is performed (all settings except »Sensor Address«, »WS Cal. Factor« and »WD Cal.« go to default values).

## Troubleshooting

Symptom	Action
The receiver/display unit cannot read the sensor ("No data" appears on the display)	<ul style="list-style-type: none"> <li>- check if the correct sensor address is set on the display unit</li> <li>- make sure the sensor is not in sleep mode (turn the cups to wake up the sensor)</li> <li>- check the sensor battery – replace the battery if needed</li> <li>- check the operation at a reduced distance to the display/receiver</li> </ul>
Interrupting and weak sensor signal	<ul style="list-style-type: none"> <li>- check for obstructions between sensor and display/receiver unit</li> <li>- place the sensor or display/receiver in a different position with better signal reception</li> <li>- reduce distance to the display/receiver</li> <li>- change or add antenna for the display/receiver unit</li> </ul>



# Bluetooth Smart Phone App (WL-410XB and WL-410XB 4-20mA model)

## Smart Phone Applications

Scarlet provides free iOS and Android Apps. Users can download directly via QR link below:



iOS



Android



## Sensor Pairing

Before pairing, please turn on the Bluetooth function on your mobile device. Make sure the mobile device with Android 4.3 or newer with Bluetooth Low Energy (BLE).

For iPhone, the device should be at least iPhone 4s or newer. In Application setting menu always set the address corresponding to the address of the sensor from which you wish to receive data. Address of the sensor is indicated on the label and in the interior of the battery compartment.

For example, enter the sensor address showed on the label, e.g. 78. Once it's paired, the data will be automatically transmitted to the mobile device.

The screenshot shows the 'Settings' menu of the app. At the top, there is a red star icon, the word 'Settings', and a 'Done' button. The menu items are: 'WS Address' with an empty input field; 'WD Address' with an empty input field; 'Combined Sensor' with a toggle switch; 'Alarm' with a toggle switch; 'Alarm Value' with an input field containing the number '8'; 'Wind Speed Unit' with a row of buttons for 'm/s', 'km/h', 'mph', and 'kt'; 'Avg. Speed Interval' with a row of buttons for '1min', '3min', and '10min'; 'Temperature Unit' with a row of buttons for '°C' and '°F'; 'Display Auto Off' with a toggle switch; and 'Restore Defaults' with a toggle switch. At the bottom, there are three links: 'Search for Sensors', 'Get Sensor', and 'Help'.

# Technical Specification

	WL-410	WL-410XB	WL-410XB/4-20mA
<b>Sensor &amp; receiver</b>			
Measurement range	0.6...50.0 m/s		
Unit	m/s, km/h, knots, mph		
Resolution	0.1 m/s		
Accuracy	+/-3%		
Averaging period	Selectable 2 s, 10 s, 30 s		
Operating voltage	12...24 V DC		
Power consumption	300 mA (max.)		
Transmission distance	400 m		1300 m
Distance with YAGI antenna	1.5...2.4 km		6.5...10.0 km
Relay contact rating	1 A/12 V DC; 1 A/24 V DC		
Temperature operating range	-25...60° C		
Sensor battery	3.6 V AA Lithium batteries		
Sensor battery life	5 years		3 years
Audible alarm	85...90 dB		
Antenna input (receiver)	50 ohm, SMA connector		
<b>Output</b>			
Relay	4 x relays, 2 A / 24 V		
Output	-	-	4...20 mA 4 mA=0 m/s 20 mA=10...50 m/s (programmable)
<b>Mechanical</b>			
Bearings	2 x precision stainless steel ball		
Sensor housing	AL/PVC		
Sensor cups (replaceable)	PA (Nylon)		
Receiver housing	ABS, IP65		
Sensor dimension	Height 210 mm, cup-to-cup diameter 120 mm		
Receiver dimension	150 x 80 x 55 mm		
Mounting	Mounts on a pipe with ø20 mm outside diameter		
Bluetooth LE	-		Yes. Range is up to 40 m.

*Subject to technical modification without notice*

## Packing list

- Wind Sensor x1
- Receiver Unit x1
- Power Adapter (input:100-240V, 50/60Hz, 1.5A; output:25V, 2.5A) x1
- Antenna x1
- 3.6V AA Lithium Battery x1
- Display Holder x1
- Waterproof Carrying Case x1

## Optional Accessories

- Magnetic Sensor Mounting Bracket
- Wind Sensor Range Extender
- External Antenna

## Spare Parts

- Wind Cups
- Battery(3.6V AA)

## Standard

EMC This instrument was designed in accordance with EMC Standards in force and its compatibility has been tested in accordance with EN61326-2 (2006).



# Maintenance, Services & Warranty

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## Warranty Conditions

This instrument is guaranteed for one year against material or production defects, in accordance with our general sales conditions. During the warranty period the manufacturer reserves the right to decide either to repair or replace the product.

Should you need for any reason to return back the instrument for repair or replacement take prior agreements with the local distributor from whom you bought it. Do not forget to enclose a report describing the reasons for returning (detected fault). Use only original packaging. Any damage occurred in transit due to non-original packaging will be charged anyhow to the customer.

The warranty doesn't apply to:

Accessories and batteries (not covered by warranty)

Repairs made necessary by improper use (including adaptation to particular applications not foreseen in the instructions manual) or improper combination with incompatible accessories or equipment.

Repairs made necessary by improper shipping material causing damages in transit.

Repairs made necessary by previous attempts for repair carried out by non-skilled or unauthorized personnel.

Instruments for whatever reason modified by the customer himself without explicit authorization of our Technical Dept.

The contents of this manual may not be reproduced in any form whatsoever without the manufacturer's authorization.

Our products are patented. The logotypes are registered. We reserve the right to modify characteristics and prices as part of technological developments which might require them.

## Battery Replacement

Low battery icon displayed in LCD indicates the user needs to replace batteries on sensor.

To replace:

- Unscrew the O-ring sealed battery cap anti-clockwise.
- Pull out the battery holder, remove old battery and insert new one.
- Insert the battery cap back and screw the O-ring sealed battery cap.

**NOTE: Please make sure screw the O-ring sealed cap correctly to have the best dust and water proof capability.**

## Services

Shouldn't the instrument work properly, before contacting your distributor make sure that batteries are correctly installed and working, check the test leads and replace them if necessary.



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