# WR-3 Plus
## Wireless Anemometer
## User Guide

# Page Contents

# Introduction

Scarlet WR-3 Plus is an industrial grade wireless anemometer for multipurpose applications and long-term environmental monitoring.

WR-3 Plus includes a wireless long-range sensor and a portable datalogger display suitable for both permanent and temporary installation.

The system measures current/average/maximum wind speed, temperature, wind chill, Beaufort scale, atmospheric pressure, and historic data graphic in high accuracy with customer selectable measurement units. Users can receive instant data and wind speed alarm at a distance up to 500-meter radius from the sensor.
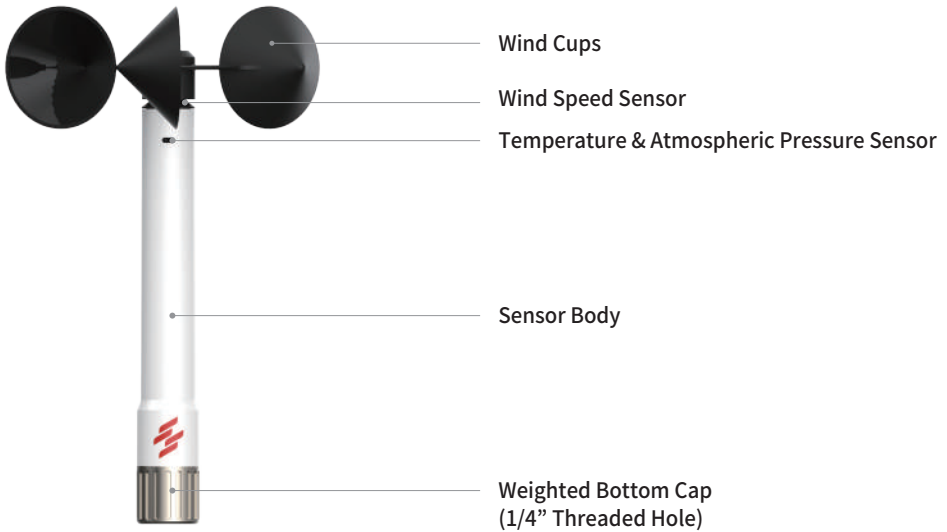
WR-3 Plus further supports data logging and can export data in excel format to computers by using micro USB output.

# Sensor & Receiver

## ▬ Sensor



- Wind Cups
- Wind Speed Sensor
- Temperature & Atmospheric Pressure Sensor
- Sensor Body
- Weighted Bottom Cap (1/4" Threaded Hole)

## Wireless Connection

Each sensor has a unique wireless address number that has been pre-paired corresponding to the receiver display. One sensor can be connected to multiple receivers. Several anemometers can operate in close proximity without disturbance.

## Transmission Range

The connection between sensor and receiver goes through Sub-1GHz wireless band (868, 915 MHz). The signal strength is shown on the receiver MAIN page. The transmission range between the sensor and the receiver can reach up to 500 meters in a direct line of sight. Inside buildings or obstacles in between may decrease the transmission range.

## Receiver



Antenna

LED Indicator

Micro USB Port

Display

Slip-proof Holster

Keypad



Battery Cover

# Keypad



| icon | Name | Functions |
|------|------|-----------|
| ⏻ | Power | Power ON / OFF |
| ≣ | Settings | Go to Main / Settings page |
| ↵ | Enter | Select; Confirm |
| C | Cancel | Cancel; Go back to the previous page |
| ▲ | Up | Up; Increase number; Change option |
| ▼ | Down | Down; Decrease number; Change option |
| ◄ | Left | Previous page |
| ► | Right | Next page |

# Navigation Diagram

After pressing the Power button, the receiver will enter the MAIN page. Users can press Right/Left and Settings /Cancel buttons to navigate through the pages.

⟷ : Switching by **Right** and **Left** buttons

●——● : Switching by **Settings** and **Cancel** buttons

⟵——→ : Switching by **Enter** and **Cancel** buttons

```
┌──────────┐     ┌──────────┐     ┌──────────┐     ┌──────────┐
│   MAIN   │ ⟷  │ AVG / MAX│ ⟷  │  CHART   │ ⟷  │ HISTORY  │
│   page   │     │   page   │     │   page   │     │   page   │
└────┬─────┘     └──────────┘     └──────────┘     └──────────┘
     │
     │
┌────┴─────┐              ┌──────────────┐
│ SETTINGS │ ⟵───┬──────→│ WIND SPEED   │
└──────────┘      │       │    page      │
                  │       └──────────────┘
                  │
                  │       ┌──────────────┐
                  ├──────→│ DATA LOGGING │
                  │       │    page      │
                  │       └──────────────┘
                  │
                  │       ┌──────────────┐
                  └──────→│  GENERAL     │
                          │    page      │
                          └──────────────┘
```
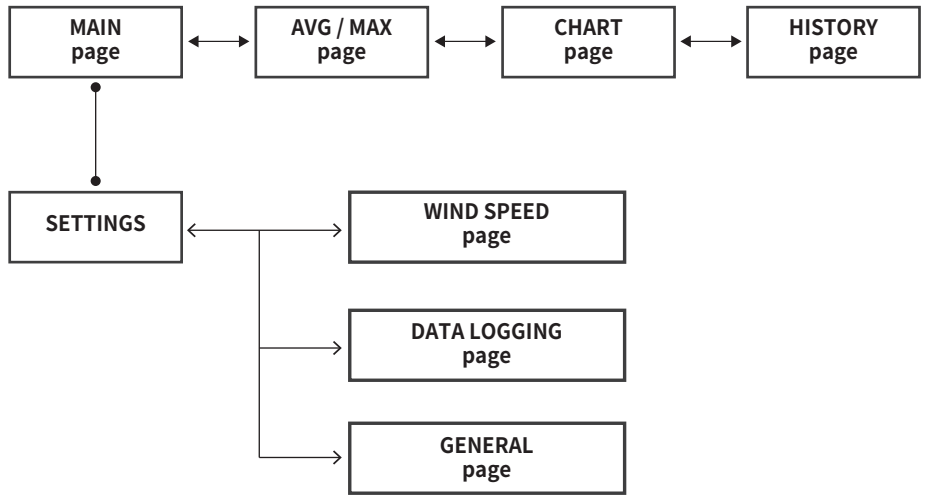
## ◼◼ MAIN page
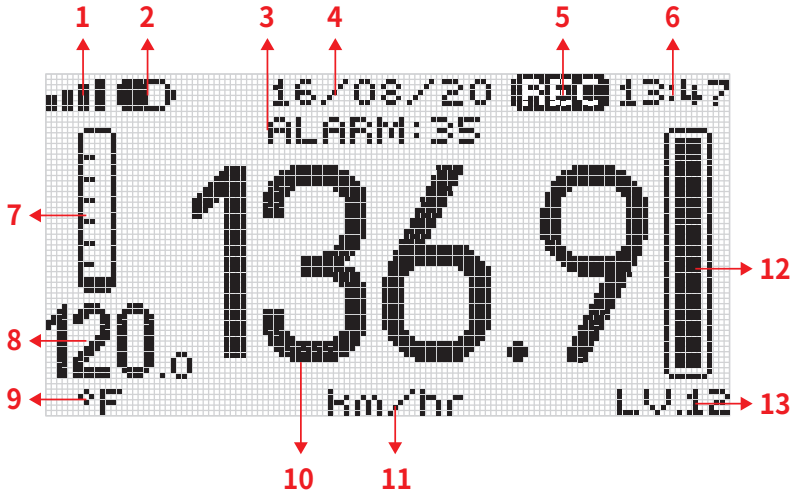


| Number | Name | Definition |
|--------|------|------------|
| **1** | Signal Strength | The wireless signal strength between sensor and receiver |
| **2** | Receiver Power | Receiver battery level or power supply through micro USB ⊷▥ |
| **3** | Wind Alarm Threshold | The set wind speed alarm trigger threshold |
| **4** | Date | Current date in DD/MM/YY |
| **5** | Data Logging | Indicate the data logging function is turn ON |
| **6** | Time | Current time in HH:MM (24hr military time) |
| **7** | Thermometer | Current temperature graph (-10 to 60°C, 7 scales in total, 10°C each scale) |
| **8** | Temperature | Current temperature |
| **9** | Temperature Unit | Temperature unit: °C or °F |
| **10** | Wind Speed | Current wind speed |
| **11** | Wind Speed Unit | Set wind speed unit (m/s, km/hr, MPH, knots) |
| **12 & 13** | Beaufort Scale | Beaufort wind force scale (unit BFTS, 12 levels in total) |

## AVG/MAX page
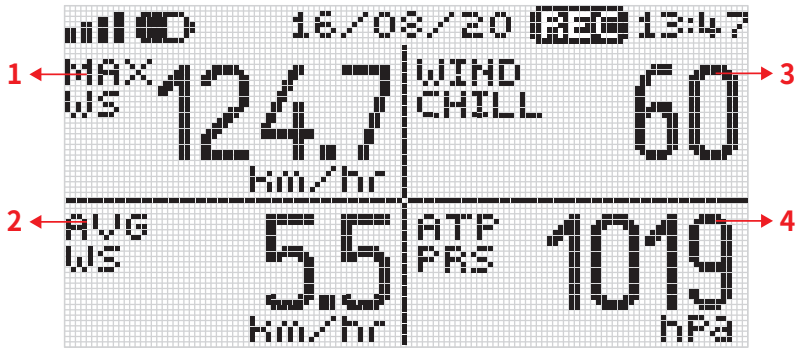


| Item | Name | Definition |
|------|------|------------|
| 1 | Maximum Wind Speed | Maximum wind speed for the past 12 hours since Receiver turns ON |
| 2 | Average Wind Speed | Average wind speed for the past 12 hours since Receiver turns ON |
| 3 | Wind Chill | Current wind chill index |
| 4 | Atmospheric Pressure | Current atmospheric pressure |

## CHART page
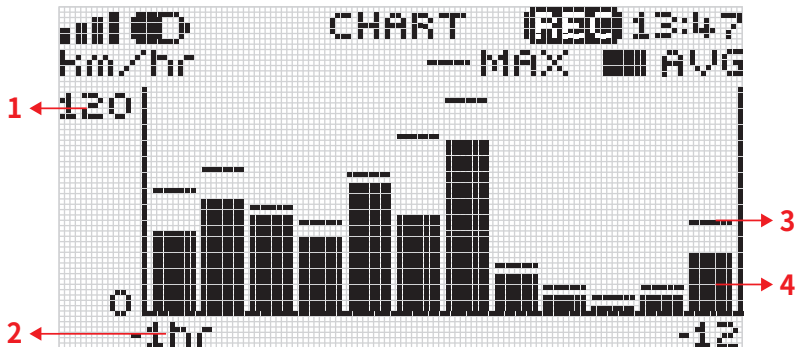


| Item | Name | Definition |
|------|------|------------|
| 1 | Wind Speed Value | Show wind speed value. (0 to max selectable unit) |
| 2 | Time | Show hourly wind speed data from the past 12 hours from the current time (from -1 to -12) |
| 3 | Maximum Wind Speed | The period of maximum wind speed |
| 4 | Average Wind Speed | The period of average wind speed |

## ■ HISTORY page
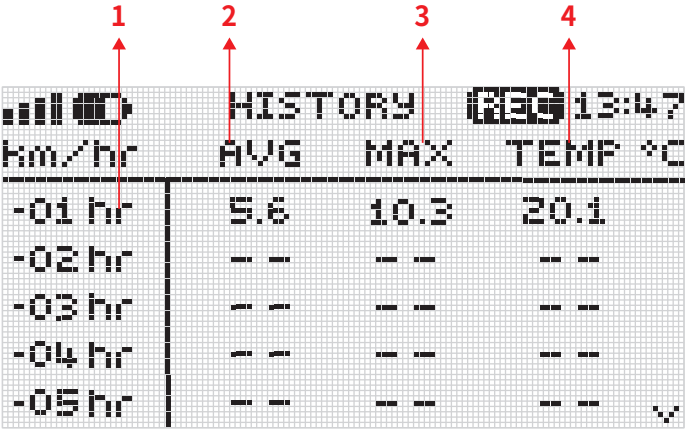


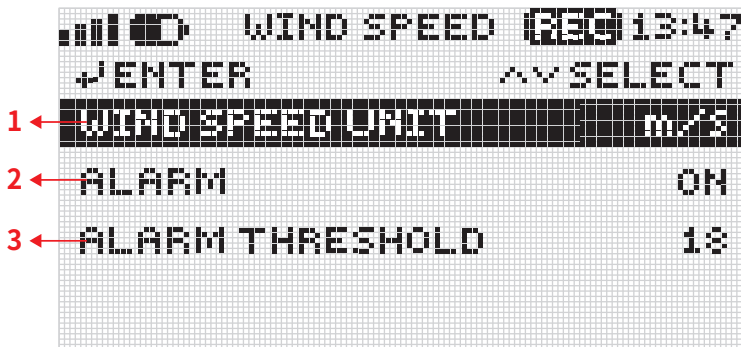| Item | Name | Definition |
|------|------|------------|
| 1 | Time Period | The past 12 hours of wind data from the current time (from -1 to -12) |
| 2 | Average Wind Speed | Average wind speed of the corresponding period |
| 3 | Maximum Wind Speed | Maximum wind speed of the corresponding period |
| 4 | Average Temperature | Average temperature of the corresponding period |

## ◼ SETTINGS Page



| Item | Name | Definition |
|------|------|------------|
| 1 | Wind speed page | Wind speed and alarm setting |
| 2 | Data logging page | Data logging setting and management |
| 3 | General page | General setting page |
| 4 | Version | Current receiver firmware version info |

## ◼ WIND SPEED settings page



| Item | Name | Definition |
|------|------|------------|
| 1 | Wind Speed Unit | Wind speed measurement unit: m/s (default), km/hr, MPH, knots |
| 2 | Alarm | Wind speed alarm function: ON (default) /OFF |
| 3 | Alarm Threshold | Wind speed alarm threshold: 1 to 180 at selected unit, (default: 18) |

## ◼ DATA LOGGING settings page
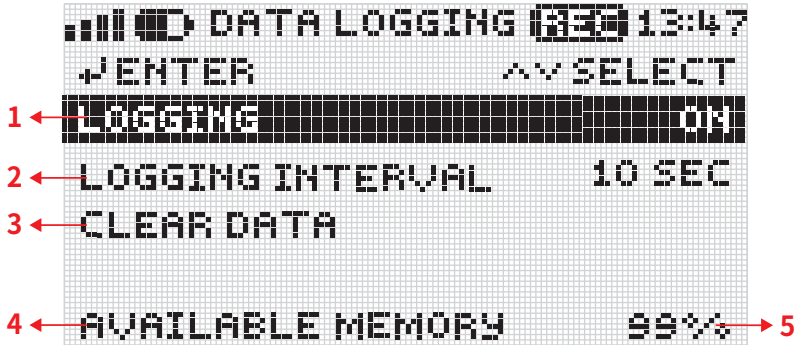


| Item | Name | Definition |
|------|------|-----------|
| **1** | Logging | Logging function: ON / OFF(default) |
| **2** | Logging interval | Data logging interval: 2 sec, 5 sec, 10 sec (default), 1 sec, 5 min, 10 min, 60 min |
| **3** | Clear data | Clear all data to release the memory |
| **4** | Available memory | Remaining data storage space in percentage |

## ■ GENERAL settings page

```
.ıll (( ))      GENERAL    REC 13:47
↵ENTER                   ∧∨SELECT
1 ◄  DATE                    18/08/30
2 ◄  TIME                       13:47
3 ◄  SENSOR ADDRESS               23
4 ◄  TEMPERATURE UNIT             °C
5 ◄  ATMOS PRESS UNIT            hPa
```

```
.ıll (( ))      GENERAL    REC 13:47
↵ENTER                   ∧∨SELECT
6 ◄  DISPLAY AUTO OFF            OFF



7 ◄  SENSOR BATTERY             99%
```
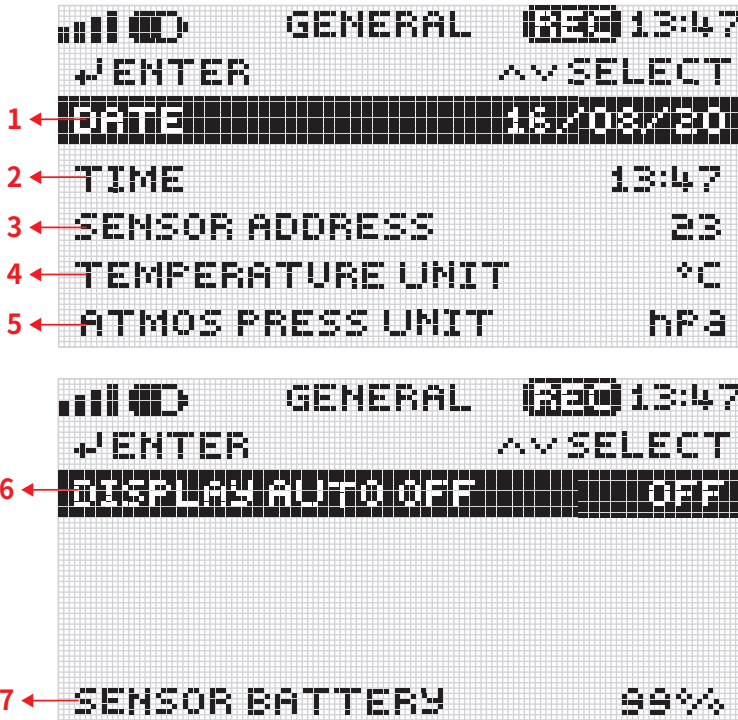
| Item | Name | Definition |
|------|------|------------|
| 1 | Date | Set current data. DD/MM/YY |
| 2 | Time | Set current time. HH:MM (24hr military time) |
| 3 | Sensor Address | Set the wireless sensor address number that connected to this receiver |
| 4 | Temperature unit | Unit for temperature measurement. °C (default)/°F |
| 5 | Atmospheric pressure unit | Unit for atmospheric pressure measurement. hPa (default), mm Hg, bar |
| 6 | Display auto off | Display automatically switch to power saving mode after the set idle period. OFF (default), 5 min, 10 min, 30 min |
| 7 | Sensor Battery | Battery power percentage of the wireless sensor |

# Functions

## ▉ Sensors Pairing

The wireless address number is labelled on the sensor body, as well as in the setting of each receiver.
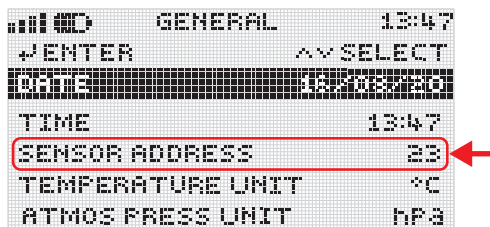


**Change Receiver wireless address:**
1. press Settings button go to SETTINGS page
2. press Enter on GENERAL to go to GENERAL setting page
3. press Enter on SENSOR ADDRESS
4. press UP/DOWN cursor to change the number in coordination with the AD number on sensor label
5. When the sensor and receivers are wirelessly connected, the receiver's LED indicator will beep twice and flash GREEN light twice.

*When the wireless connection between sensor and receiver is lost for over 10 minutes, the LED indicator will flash red light every 10 seconds.*

## ▉ Time and Measurement Units Setting

**Change date, time, temperature unit, atmosphere pressure units:**
1. press Settings button go to SETTINGS page
2. press Enter on GENERAL to go to GENERAL setting page
3. press UP/DOWN and Enter to select and change the section unit

**Change wind speed measurement unit:**
1. press Settings button go to SETTINGS page
2. press Enter on WIND SPEED to go to WIND SPEED setting page
3. press Enter on Wind SPEED UNIT
4. press UP/DOWN cursor to select the unit: m/s (default), km/hr, MPH, knots

## ◼️ Wind Speed Alarm

The built-in buzzer will be triggered when the wind speed exceeds the set threshold. The display backlight flashes AMBER and LED indicator continuously lights up in RED.

**Set alarm threshold:**
1. press Settings button go to SETTINGS page
2. press Enter on WIND SPEED to go to WIND SPEED setting page
3. press Enter on ALARM THRESHOLD
4. press UP/DOWN cursor to set the wind speed alarm threshold

**Turn on alarm function:**
1. press Settings button go to SETTINGS page
2. press Enter on WINDSPEED to go to WINDSPEED setting page
3. press Enter on ALARM
4. press UP/DOWN cursor to select ON

## ◼️ Data Logging

**Set logging interval: (default interval: 10 seconds)**
1. press Settings button go to SETTINGS page
2. press Right button go to DATALOGGING setting page
3. press Enter on LOGGING INTERVAL (select logging interval: 2 sec, 5 sec, 10 sec, 1min, 5min, 10min, 60 min)

*Logging interval can only be altered while the datalogging function is OFF.*

**Start Logging:**
1. go to DATALOGGING setting page (see steps above)
2. press Enter on LOGGING
3. press UP/DOWN cursor to select ON
4. Start datalogging: select YES
5. ▦ will display on screen the top left corner to indicate the data logging function is ON

*When the data logging function is ON, the receiver cannot be turn OFF.*

**Finish Logging:**
1. go to LOGGING setting (see steps above)
2. press UP/DOWN cursor to select OFF
3. Stop datalogging: select YES
4. A logged file will be created when the logging status switch from "ON" to "OFF"

There are 2 conditions which will automatically turn the data logging function OFF:
- The battery level of the receiver is under 5%.
- There is no available memory space in the receiver

*For long-term data recording, please supply the receiver power through micro USB cord or make sure the battery power for Receiver is sufficient for the entire logging period.*

## ▨▨ Data Export

1. Download and unzip "WR3PR.zip" file to your PC from Scarlet's website:
https://scarlet-tech.com/wp-content/uploads/2021/02/WR3PR.zip

2. Connect the receiver to PC via micro USB cable.
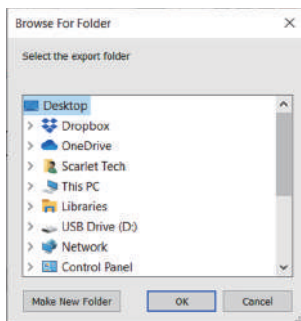Make sure the datalogging feature is turn OFF (see Finish Logging)
A new USB drive will show up on your devices list indicates the receiver is connected to your computer.
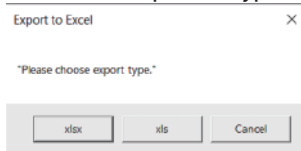3. Double click to open the export software "WR3PR.exe"
4. Select the COM Port of your receiver* then press "Download" button
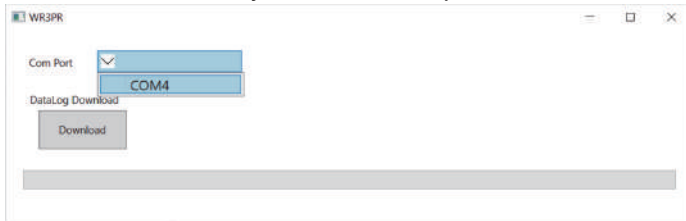


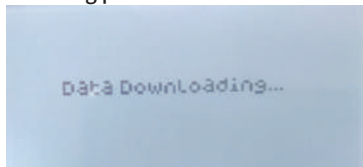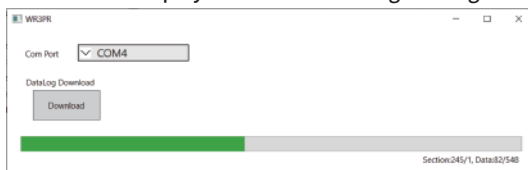5. Select the download folder for the logged files



6. Select the export file type
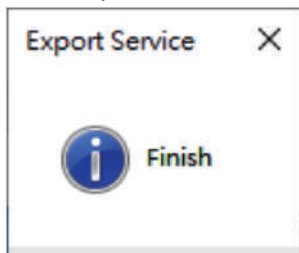


7. WR3PR will start exporting the logged files.
Receiver will display "Data Downloading" during the downloading process.

8. Wait for the "Finish" pop-up that indicates the data exporting is complete.

*Depending on the data amount and PC performance, the downloading time will vary from a few minutes up to half an hour.*
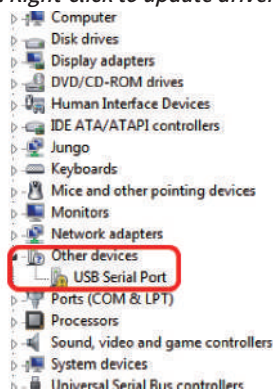


*\*Please update the USB driver if the COM port is unidentified.*
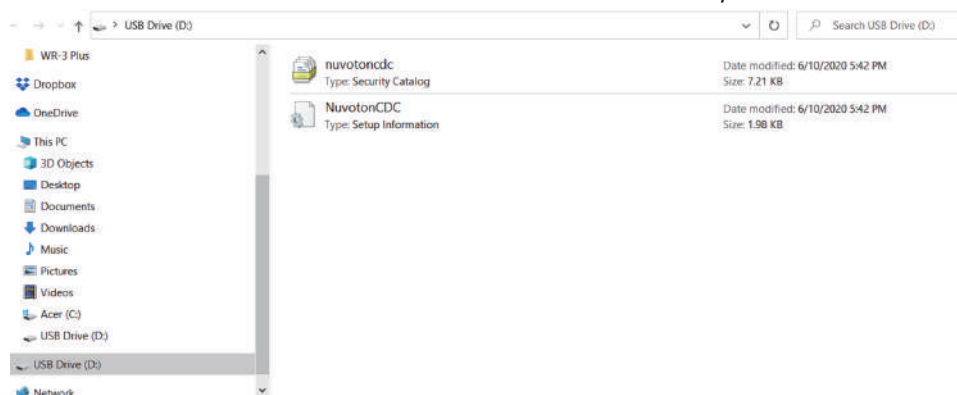*1. Go to "Device Manager"*
*2. Select the update the "Unknown Device" (or "USB Serial Port") with exclamation mark.*
*3. Right-click to update driver*



*4. Select the driver software "NuvotonCDC" in the Receiver USB drive to update*

## Power Saving Mode

In power saving mode, the LED indicator will light GREEN every 10 seconds. While the wind speed alarm function is ON, the buzzer will be triggered while wind speed exceeds the set threshold.

**Enable power saving mode:**
1. press Settings button go to SETTINGS page
2. press Enter on GENERAL and Down to go to the 2nd page of GENERAL setting
3. press Enter to select DISPLAY AUTO OFF
4. press UP/DOWN cursor to set the idle period: 5min, 10min, 30min

*The receiver display will automatically turn off after the set idle period to save battery power. The display will light up when any key is pressed.*

## Power Off

When the data logging function is ON, the Receiver cannot be powered-off by pressing power button directly. Please make sure to export the data before turn the power off.

**Turn off the DATALOGGING function**
1. press Settings button go to SETTINGS page
2. press Enter on LOGGING
3. Turn off datalogging: select YES

**Press Settings go to MAIN menu**
**Long press the power button for 5 seconds**

# Installation

WR-3 Plus's magnetic installation accessories support fast and flexible installation and do not require any welding or wiring on the equipment. The system setup takes place automatically upon booting up.

## Sensor Installation

WR-3 Plus's sensor bottom cap has a 1/4" threaded hole for installation.

You can use Scarlet's **Magnetic Sensor Mounting Bracket** to attach the sensor to any iron/steel surface and to keep it perpendicular to the ground.

1. Loosen the clamp
2. Insert the sensor body from the bottom of the clamp
3. Tighten the clamp
4. Apply wind cups on wind sensor bearing
5. Make sure you hear a "CLICK" sound that indicates all parts are locked in place.
6. Attach the bracket on the desire magnetic surface

CLICK
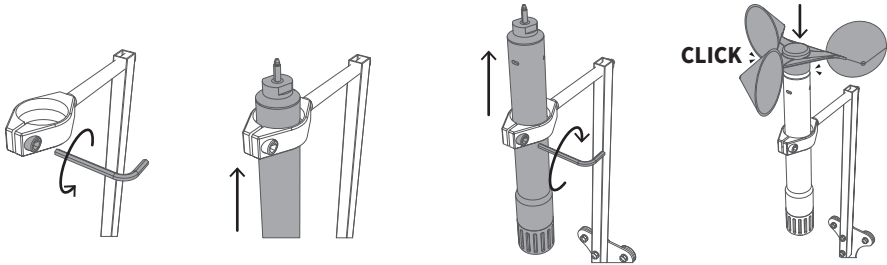
## Receiver Installation

WR-3 Plus's Receiver Holder Kit comes with an anti-slip display holder with neodymium magnets on both ends and three pieces of adhesive metal flakes.

1. Peel off the backing paper of the metal flake to reveal the adhesive side
2. Press and stick the adhesive side of the metal flake to the Receiver's back cover
3. Attach the receiver to the display holder magnetically

You can attach the display holder on any magnetic surface or adhesive the metal flake on the non-magnetic surface first before attaching the magnetic display holder.

Paste Here

Metel Flake

Metel Flake

Paste Anywhere

Receiver (Back)

Receiver Holder
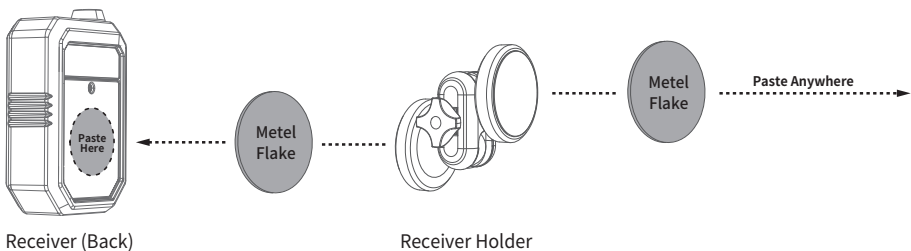
# Technical Specification

## Wireless Sensor

| Item | Definition |
|---|---|
| Frequency | 868MHz, 915MHz |
| Distance | Max 500m* (depends on the applied environment) |
| Data Rate | Every 2 seconds |
| Power Supply | 3.6V 18505 Lithium battery x1 |
| Waterproof Rating | IP67 |
| Weight | 360g |
| Dimension | 262.5 x 183.5 x32mm |

## Receiver

| Item | Definition |
|---|---|
| Receiver Buzzer | > 80dB |
| Built-in Memory | 64MB |
| Output | .xlxs, .xls |
| Data Logger | Current wind speed |
| | Average wind speed |
| | Maximum wind speed |
| | Current temperature |
| | Current atmospheric pressure |
| Logging Interval | 2 seconds, 5 seconds, 10 seconds (default), 1 minute, 5 minutes, 10 minutes, 60 minutes |
| Power Supply | 1.5V AA battery x3 |
| | Micro USB power cord |
| Dimension | 189.6 x 75.6 x 36.3mm |
| Weight | 290g |

## Wind Speed Sensor

| Item | Definition |
|---|---|
| Measurement Unit | m/s (default)<br>knots<br>MPH<br>km/hr |
| Measurement Range | 0.3…50 m/s |
| Measurement Resolution | 0.1 m/s<br>0.1 knots<br>0.1 MPH<br>0.1 km/hr |
| Measurement Accuracy | ±2% FS |

## Temperature Sensor

| Item | Definition |
|---|---|
| Measurement Unit | °C (default)<br>°F |
| Measurement Range | -30°C…60°C |
| Measurement Resolution | 0.1°C<br>0.1°F |
| Measurement Accuracy | ±1°C |

## Atmospheric Pressure Sensor

| Item | Definition |
|---|---|
| Measurement Unit | hPa (default)<br>mmHg<br>bar |
| Measurement Range | 500…1100 hPa |
| Measurement Resolution | 1 hPa<br>0.1 mmHg<br>0.001 bar |
| Measurement Accuracy | ±4 hPa |

# Package Content

- Wireless Sensor
- Wind Cups
- Receiver
- Receiver Antenna
- Receiver Holder
- Adhesive Metal Flakes x 3 (for Receiver Holder installation)
- AA Battery x 3 (for Receiver)
- 3.6V 18505 Lithium battery x1 (placed in Sensor)
- User Manual & Certificate



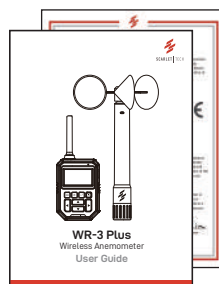| Wireless Sensor | Wind Cups | Receiver | Receiver Antenna | Receiver Holder |



| AA Battery x 3 (for Receiver) | 3.6V 18505 Lithium battery x1 (placed in Sensor) | User Manual & Certificate |

## Optional Accessories

- Magnetic Sensor Mounting Bracket
- Spare Wind Cups
- Spare Sensor Battery (3.6V 18505 Lithium battery)
- External Antenna



Magnetic Sensor
Mounting Bracket

Wind Cups

3.6V 18505 Lithium battery x1
(placed in Sensor)

# Safety, Maintenance, & Warranty

## Operating Environment

The operating temperature of the anemometer system is designed to work in an ambient temperature between 5°C to 60°C (40°F to 140°F) at 20~80%RH. The storage temperature is between -20°C to 60°C (-4°F to 140°F). The instrument can be damaged if stored and operated outside of these temperature ranges. Avoid exposing the instrument to extreme changes of weather and or temperature in a continuous short period of time.
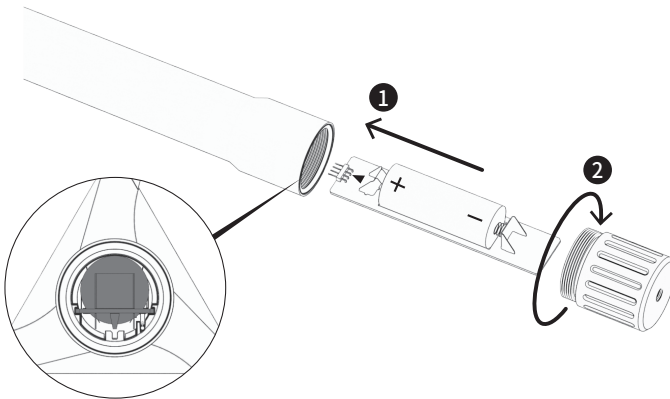
## Sensor  Battery Replacement

The wireless sensor is powered by a 3.6V 18505 Lithium battery. Its battery level is displayed on the 2nd page of the GENERAL setting.

- Turn the battery cap counter clockwise to remove it.
- Take out the battery container from the sensor.
- Replace the battery with a new 3.6V 18505 Lithium battery.

Container Connector
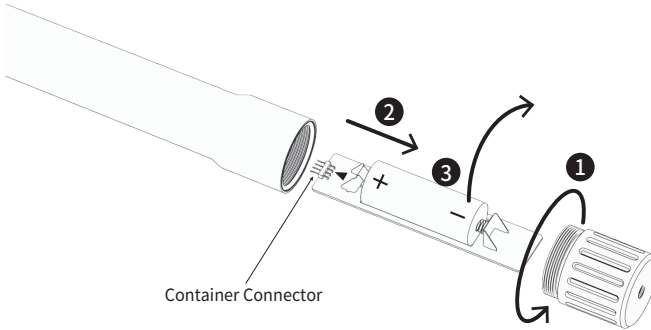
- Put back the battery container into the sensor (Please note the placement direction).

▪ Make sure the O-ring is correctly aligned to the battery cap for waterproof protection.
▪ Put back the battery cap in clockwise direction to finish the battery changing.

O-ring ←

## Receiver Battery Replacement

The receiver is powered by 3 AA 1.5V batteries. The battery level is displayed on the top of the display.

▪ Remove the screw and then remove the battery cover on the back.
▪ Replace the batteries with 3 new 1.5V AA batteries.
▪ Place back the battery cover and fasten the screw.

## Warranty Conditions

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

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

Scarlet Tech's One-year Limited Warranty does NOT apply to:

▪ Accessories and batteries (not covered by warranty)

▪ Repairs made necessary by improper use 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 the repair carried out by non-skilled or unauthorized personnel.

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

The contents of this manual may not be reproduced in any form whatsoever without the authorization from Scarlet Tech.