

MISTRAL



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Version 2.4

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CAUTION

- ❑ **Protect the equipment against splashing, rain and excessive sun rays.**
- ❑ **Never use the device if it is damaged or insecure.**
- ❑ **Do not open the case; there is nothing that needs servicing inside it. Nevertheless, if the case must be opened, you must call for some qualified personnel. The power supply cable must be disconnected before opening the case.**
- ❑ **The information contained within this document may be modified without warning.**
- ❑ **Swiss Timing LTD cannot be held responsible for errors within this document nor for any subsequent nor consequential damages (including loss of profit) arising from its provision, nor performance or use of products described herein, which will be covered by another guarantee, contract or other legal document.**



This symbol indicates that this product should not be disposed with household waste. It has to be returned to a local authorized collection system. By following this procedure you will contribute to the protection of the environment and human health. The recycling of the materials will help to conserve natural resources (valid in the EU member states and in any countries with corresponding legislation).

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1 INTRODUCTION

Mistral is an Ultrasonic wind gauge (as requested by the IAAF rule 163.11) with integrated scoreboard displaying wind speed in the race direction from -9.9m/s to $+9.9\text{m/s}$.

The **Mistral** can be used stand alone or connected (remote control) to the Scan'O'Vision photofinish by cable or wireless by BlueTooth (option).

The wind speed is displayed by amber LED's with 4 steps of luminosity, automatically adjusted with a light sensor (from "night" to "very sunny").

2 INSTALLATION

After transportation, you will need to screw the feet perpendicular [1] to the scoreboard by using a 5mm 6 pans wrench (not provided).



Fig. 1

Then you can unscrew the wind sensor pole (under the scoreboard) and screw it.

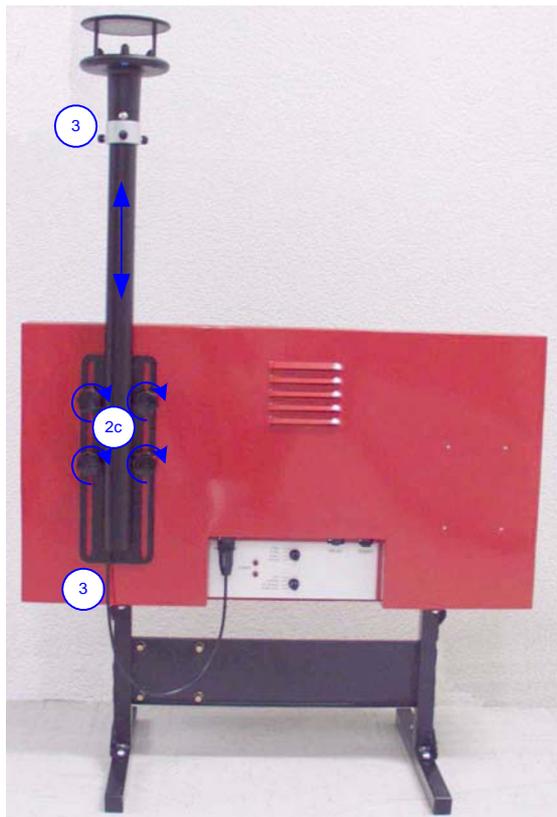


Fig. 2

Then install the sensor head on the top of the pole, and pass the sensor cable inside the pole [3].

Please verify that the correct voltage 115/230VAC is selected inside the Mistral (see chapter 3). The default factory setting is 230VAC.

Place the board at the correct location according to the rules for the wind measurement. Then orientate the display in order for it to be seen by the spectators.

The head must then be positioned in height and direction. The height can be adjusted at the rear of the board:

1. Unscrew the 4 hand-screws
2. Choose the height
3. Screw the 4 hand-screws

The sensor height must be measured in the middle of the head. According to the IAAF rules, it must be situated 1.22m from the ground (chapter 12 is a summary of IAAF rules). Normally it is when the black plate is at the top of the red case.



Fig. 3

Finally the head must be placed in the direction of the race, the arrows / colour mark must point in the race direction (finish). In order to turn the head in the required position, use the three small hand-screws located under it [3].

Reminder: if you move or turn the scoreboard, do not forget to re-adjust the direction and height of the head.

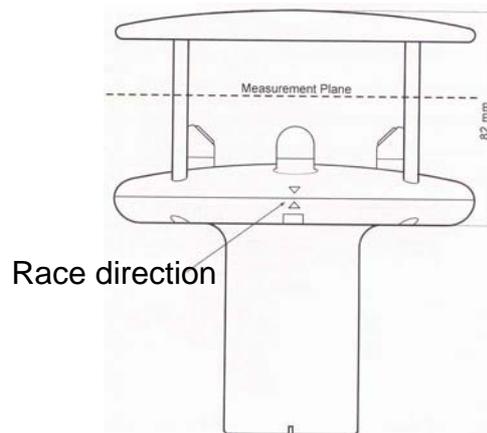
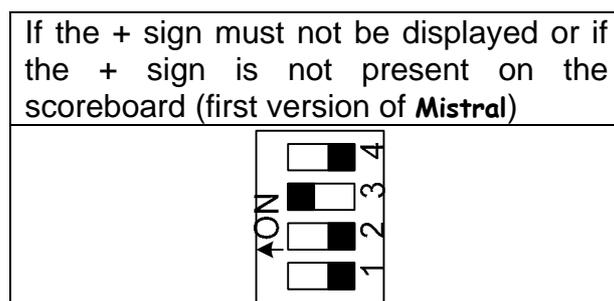
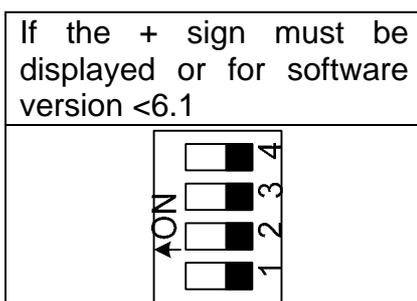


Fig. 4

3 CONFIGURATION

From the version 6.1 of the internal software, it is possible to select if the + sign must be displayed for positive wind measurement.

- Open the **Mistral** by turning the two locks with the provided triangle key.
- Select the internal switch:



- Close the **Mistral** with by turning back the two locks with the provided triangle key.

4 INTERNAL BATTERY CHARGER

4.1 New of Mistral (with the + sign on the display)

The new version of **Mistral** can be powered with 115VAC or 230VAC without any manual switching.

The internal battery is automatically charged when the main AC power is connected, even if the power switch is on the OFF position. If the battery is fully discharge, it will take approximately 2 hours to fully charge it.

4.2 First of Mistral (with the - sign on the display)

Before the first power on, please select the correct power input according to your location:

- Open the **Mistral** by turning the two locks with the provided triangle key.
- With a small screwdriver select 115V or 230V according to your country.
- Close the **Mistral** with by turning back the two locks with the provided triangle key.



Fig. 5

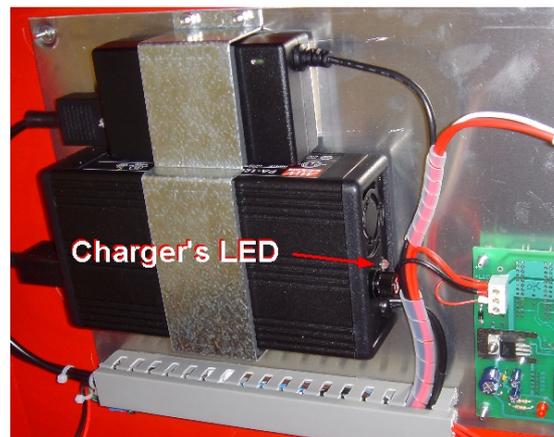


Fig. 6

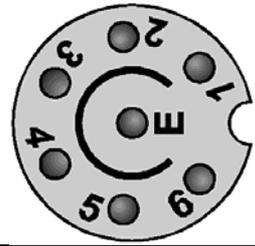
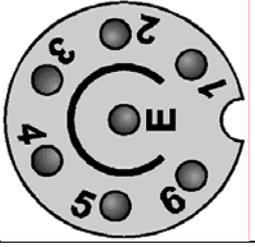
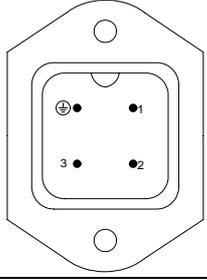
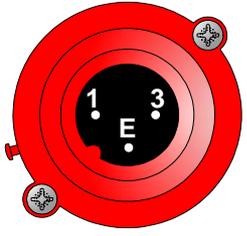
Do not move the **I/O** internal switch of the battery charger; it must always be on **I**.

The internal battery is automatically charged when the main AC power is connected, even if the power switch is on the OFF position. If the battery is fully discharge, it will take approximately 2 hours to fully charge it.

The internal battery charger contains a LED (see Fig. 6), it indicates:

- | | |
|-----------------|--|
| Red: | Battery charging in progress. |
| Green: | Battery fully charged. |
| Green flashing: | Battery not connected or wrong polarity. |

5 CONNECTIONS AND SWITCHES

Connector	Pinning	
WINDSONIC (Tuchel 7pF)	2: +12V output (maximum 40mA) 3: RD head 5: TD head 7: GND	
RS422 [2x] (Tuchel 7pF)	2: +12V output (maximum 40mA) 3: Tx- 4: Tx+ 5: Rx- 6: Rx+ E: GND	
POWER [version A] (Harting 4pMT)	1: N (115 - 230VAC) 2: L (115 - 230VAC) T: GND	
POWER [version B] (Tuchel 3pMT)	1: L (115 - 230VAC) 3: N (115 - 230VAC) E: GND	
START (Banana)	Normally open contact for start of measurement.	

Switch	Description
SELECT 5 SEC. 10 SEC. 13 SEC. REMOTE	Duration of acquisition: 5 seconds 10 seconds 13 seconds Selected remotely by the RS422.
POWER OFF ON	Mistral OFF , if AC power connected, battery is charging. Mistral ON , working on main POWER (115/230V) or (if no power or power failure) on battery (automatic switching).

After a measurement, the display shows the result during 3 minutes and then clears.

6 GETTING STARTED

- Install the **Mistral** as explained in chapter 2.
- Connect the head on the WINDSONIC connector.
- To work with the main power, connect the power on the POWER connector.
- Set the power switch on ON.
- The scoreboard will display some characters:
 - +8.8 (all LEDs on)
 - ---
 - Version of the software (for example 6.1)
 - Clear the scoreboard
- Wait until the scoreboard automatically clears, if it did not happen, verify the WINDSONIC head is correctly connected.

For a stand alone device:

- Connect the push button (normally open contact) on the two START bananas. When not used, the push button can be stored by clipping it on the head's pole (see Fig. 3).
- According to the rules, select the acquisition duration with the select switch (5 sec, 10 sec or 13 sec).
- Press the push button to start an acquisition. The measurement is automatically displayed. During the measurement, the point on the display is lighted.
- The scoreboard will be cleared automatically after 3 minutes or when you start a new acquisition.
- In this mode, another scoreboard or a timing device can be connected on the RS422 output. At the end of the acquisition, the measurement is automatically sent on the RS422 output.

For a remote device:

- Connect the master device (for example the Scan'O'Vision *Bridge* Multiplex) on the RS422 connector (a bi-directional connection is needed).
- Set the select switch on REMOTE.
- Control the Reset, start of acquisition and duration with master device.

7 SCAN'O'VISION WITH MISTRAL

To have automatically the wind measurement into you photo-finish results, you can connect the **Mistral** to the Scan'O'Vision computer or Scan'O'Vision *Bridge* Serial Multiplex. If you want to connect the **Mistral** to a RS232 serial line on your computer (or the Serial 1 or 2 of the Scan'O'Vision *Bridge* Serial Multiplex), you will need a RS232 ↔ RS422 converter. You can also connect the **Mistral** (RS422 connector) directly on the Serial 3 or Serial 4 of the Scan'O'Vision *Bridge* Serial Multiplex.

In any case, be sure to never cable/use the pin 2 (+12V) of the RS422 Mistral connector. This connection is only done to power the Bluetooth wireless transmission option.

In the *Windmeter* configuration window of the Scan'O'Vision software, please select as transmission protocol:

- OMEGA (<--): if you only want to receive the measurement (a judge is operating the **Mistral**).
- OMEGA (<-->): if the **Mistral** must be controlled by the Scan'O'Vision software (no operator required on the **Mistral**).

In this window, be sure to select 9600 Bauds, 8 data bit, 1 stop bit, no parity for the transmission parameters.

8 WIRELESS DATA TRANSMISSION

As option, you can install a Bluetooth module to get wireless data transmission to the timing room for example.

To fix the Bluetooth interface on the **Mistral**:

- Unscrew the four plastic screws of the Bluetooth box and remove the cover.
- Fix the back of the box on the back of the **Mistral** with four M4 screws.
- Replace the cover of the box and fix it with the four plastic screws.
- Connect the cable to one of the RS422 Tuchel connector.



Fig. 7

9 TRANSMISSION PROTOCOL

Transmission on the RS422 connector in 9600 Bauds, 8 data bit, 1 stop bit, no parity:

Input of Mistral (only valid when the SELECT switch is on REMOTE):

Acquisition duration:

```
<SOH> <DC3> CWI <STX> XX <EOT>
```

Start of measurement:

```
<SOH> <DC3> CWS <EOT>
```

Reset (stop the acquisition, clear the scoreboard):

```
<SOH> <DC3> CWR <EOT>
```

Ask to re-send the latest measurement:

```
<SOH> <DC3> CWO <EOT>
```

Output of Mistral:

```
<SOH> <DC3> GW <STX> <DLE> 0013sxx.x␣ <EOT>
```

This message is sent automatically at the end of each acquisition.

with: s: Sign of the measurement (+ or -)
xx.x: Value of the measurement
XX: Acquisition duration (from 01 to 30 seconds)
␣: Space character (20_{HEX})
<SOH>: 01_{HEX}
<STX>: 02_{HEX}
<EOT>: 04_{HEX}
<DLE>: 10_{HEX}
<DC3>: 13_{HEX}

10 MAINTENANCE

For best performances, fully charge the internal battery at least once per year. It is also recommended to always store the device with the internal battery fully charged.

To prevent battery damage, do not forget to switch off the device after use.

11 TECHNICAL CHARACTERISTICS

Measurement duration:	5, 10 or 13 seconds 1 to 30 seconds with RS422 serial remote control
Display:	Amber LED, 250mm height
Display luminosity:	4 steps automatically adjusted with a light sensor 
Display duration:	3 minutes after each measurement
Power:	115 / 230VAC 50/60 Hz max. 0.5A
Internal battery autonomy:	~12 hours* at maximum luminosity ~60 hours* at minimum luminosity * at 20°C with one measurement every 10 minutes
Wind speed range:	-9.9m/s to +9.9m/s
Wind speed accuracy:	±0.1m/s
Operating temperature:	0°C to +50°C
Storage temperature:	-25°C to +70°C
Moisture protection:	IP54 (IP65 for the head)
Dimensions (closed):	850 x 760 x 200 mm
Dimensions (maximum open):	850 x 1390 x 415 mm
Weight with head:	21 kg

12 SUMMARY OF IAAF RULES

This is a summary of IAAF rules for wind measurement. It refers to the "IAAF Competition Rules 2006 – 2007" handbook. Please check on the www.iaaf.org web-site for rules change.

Track event:

Rule #	Text
163.8	<p>The periods for which the wind velocity shall be measured from the flash of the Starter's gun or approved starting apparatus are as follows:</p> <p style="text-align: center;">100m 10s 100m Hurdles 13s 110m Hurdles 13s</p> <p>In the 200m event, the wind velocity shall be measured for a period of 10 seconds commencing when the first runner enters the straight.</p>
163.9	The wind gauge for track events shall be placed beside the straight, adjacent to lane 1, 50m from the finish line. It shall be positioned 1.22m high and not more than 2m away from the track.
163.10	<p>The wind gauge shall be read in metres per second, rounded to the next higher tenth of a metre per second, in the positive direction (that is, a reading of +2.03 metres per second shall be recorded as +2.1; a reading of -2.03 metres per second shall be recorded as -2.0). Gauges that produce digital readings expressed in tenths of metres per second shall be constructed so as to comply with this Rule.</p> <p>Gauges must be certified by an appropriate authority.</p> <p>All wind gauge equipment shall have been certified by the IAAF and the accuracy of the gauge used shall have been verified by an appropriate organisation accredited by the national measurement authority, such that all measurements can be traced back to national and international measurement standards.</p>
163.11	<p>Ultrasonic wind gauges shall be used at all International Competitions under 1.1 (a) to (f).</p> <p>A mechanical wind gauge should have appropriate protection to reduce the impact of any crosswind. Where tubes are used, their length on either side of the measuring device should be at least twice the diameter of the tube.</p>
163.12	The wind gauge may be started and stopped automatically and/or remotely, and the information conveyed directly to the competition computer.

Horizontal jumps:

Rule #	Text
184.4	The wind speed shall be measured for a period of 5 seconds from the time an athlete passes a mark placed alongside the runway, for the Long Jump 40m from the take-off line and for the Triple Jump 35m. If an athlete runs less than 40m or 35m, as appropriate, the wind velocity shall be measured from the time he commences his run.
184.5	The wind gauge shall be placed 20m from the take-off board. It shall be positioned 1.22m high and not more than 2m away from the runway.
184.6	The wind gauge shall be the same as described in Rule 163.11. It shall be operated and read as described in Rule 163.12 and 163.10 respectively.

The **Mistral** is an Ultrasonic wind gauge as requested by IAAF rule 163.11.

