TimeTronics

Manual
WindSpeed

SPORT TIMING SYSTEMS

Version: 2012v1

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PREFACE

Welcome to the "WindSpeed" user manual.

May we recommend you to gently leaf through the entire manual first, just to have an initial idea of how the book is structured. As we cannot possibly explain all details simultaneously, this might help you a bit in understanding and tracing things back. Of course, the table of contents will also help you in doing so.

Please note that all pictures are examples, the delivered version can be different than shown in this manual please inform yourself before purchase.

If you, after reading this document, have any further question regarding the operation or service of this or any other TimeTronics equipment, please contact your local distributor or TimeTronics directly, by email: info@timetronics.be, or call us at +32 (0) 14 23 19 11

Please also contact us if you have any remarks or advise regarding this user manual: info@timetronics.be.

Good luck with WindSpeed and thank you for your confidence in the TimeTronics products and services.

The editors.

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1. INTRODUCTION

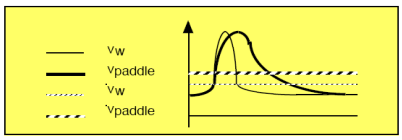
1.1. General

A precise and accurate registration of wind velocity is very significant for a sports branch as athletics. Let us remind you of the cream of track and field; the sprint races, whereby a record vitally depends on whether the athlete had the benefit of a tail wind of more than 2m/s or not.

When exceeding this 2m/s limit, a possible record will not be officially acknowledged and ratified. For long jump and triple jump as well, a precise wind measurement is a conditio sine qua non.

The best-known and ubiquitous method to measure the wind velocity is the pitot tube or a system which uses a propeller or rotating paddle wheel.

1.2. Disadvantages of a paddle wheel

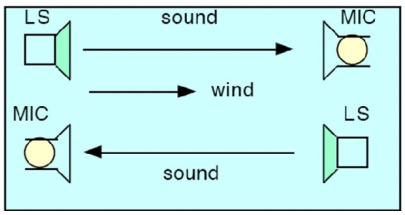


To measure minor wind velocities, a paddle wheel with a large surface and a very small friction is required, which at the same time causes certain inertia.

A short and powerful blast of wind suddenly brings the wheel to a number of revolutions. After the blast of wind has suddenly come to a standstill, the paddle wheel keeps on turning, for only the friction of the surrounding air will slow it down.

Due to the fact that these rotations are calculated within the result, the average wind velocity will be automatically increased. Moreover, rotating parts are generally subject to wear. Therefore, a good alternative for this paddle wheel is the TimeTronics' sonic anemometer or WindSpeed.

2. PRINCIPLE



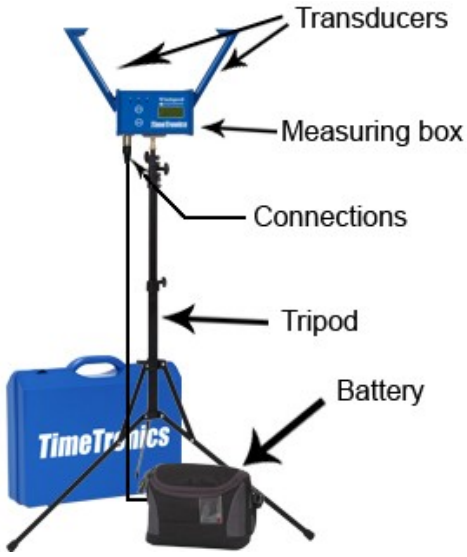
A sonic wave is sent via from a minuscule loudspeaker to a tiny microphone. As is generally known, the speed of sound approximately measures 341 m/s., which is directly related to the medium of surrounding air.

In case this medium would start moving, the sound, which "drifts" with the wind, will arrive at the MIC a little sooner than the sound, which has to travel against the wind.

By measuring and registering the difference in speed between the sonic waves, which are travelling along with the wind, and the ones, which are travelling against it, we can very accurately determine the wind velocity.

Do bear in mind that any material whatsoever does not impede the free space between the LS and the MIC.

3. DESCRIPTION OF THE DEVICE



In the first place, the device consists of a central measuring box, provided with connections for a MacFinish (II) system, a scoreboard, a battery pack or a computer.

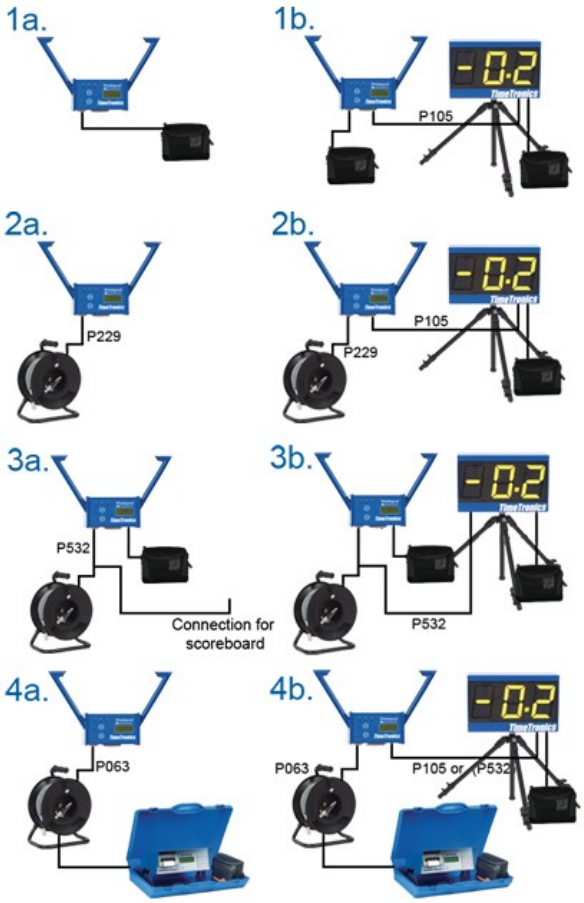
Two measuring arms are attached, having the shape of simplified antlers and consisting of 2 horns on each far end.

Each horn houses a transducer, both a tiny loudspeaker and a microphone, which is only sensitive for a limited frequency range of 40 kHz plus minus 1kHz (on ultrasonic sound). The box is mounted on a tripod, which means that the total height, covering the distance between the ground and the transducer, amounts to 1.12 m, being a value, which has been established by the track and field regulations.

4. OPERATION OF WINDSPEED

WindSpeed can be controlled either by the measuring box or by the MacFinish-box. The following configurations are possible:

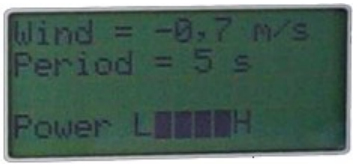
1. WindSpeed controlled by the measuring box
    a. without scoreboard
    b. with scoreboard
2. WindSpeed controlled by MacFinish II SCSI or II USB
    a. without scoreboard
    b. with scoreboard
3. WindSpeed controlled by MacFinish II Ethernet / MacFinish 2D 100 / MacFinish 2D 200
    a. without scoreboard
    b. with scoreboard
4. WindSpeed in combination with FieldTerminal
    a. without scoreboard
    b. with scoreboard



4.1. WindSpeed controlled by measuring box (without scoreboard)

4.1.1. Operation of the measuring box:

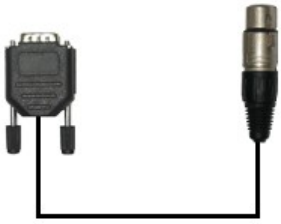
By pressing the arrow button, you can select the amount of time during which the wind velocity will be measured. You can choose between 13, 10 or 5 seconds. Subsequently, by pressing "Start", the wind measurement is initiated. After elapsing of the adjusted time, the average wind speed value appears on the display screen.



Do notice that at the bottom of the display screen, 4 little black blocks appear between L (=low) and H (=high), indicating that the voltage is still sufficiently high. Each time one of these blocks disappears; the voltage is decreasing until none of these blocks are left. This implies that the battery will have to be recharged.

4.2. WindSpeed controlled by measuring box (with scoreboard)

4.2.1 Connections (see fig. 1b)



The anemometer should receive power supply via the scoreboard, which is connected to a portable battery.

A cable connects the anemometer to the scoreboard respectively via a 9 thick-piled male plug and one 5p female plug (P105).

4.2.2. Operation

The operation is completely identical to 4.1.1. The only difference is that the result will appear on the scoreboard as well.

Again, in case of a head wind, the scoreboard will indicate a "-" in front of the result.

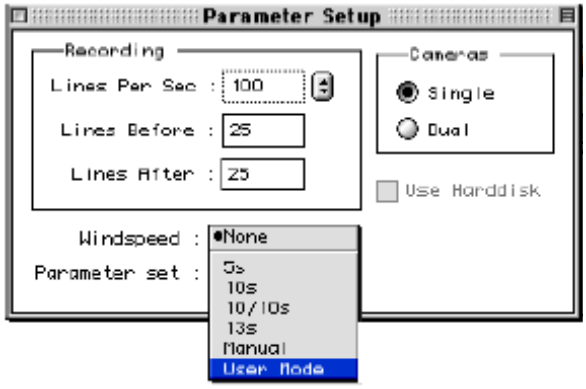
For example: -2.1

4.3 WindSpeed controlled by MacFinish II SCSI or II USB (without SB)

4.3.1. Connection (see fig. 2a)

The wind-gauge is connected to the 12 wire connection reel or box by means of an extension cord.

4.3.2. Operation



The WindSpeed is operated via the MacFinish interface box, which is connected to a 12 wire connection reel or box. The connector for the WindSpeed on the interface box should not be used. The internal electronics of the MacFinish interface box will generate the required signals to control the WindSpeed.

Go to the '**Windows**' menu (of the MacFinish program on your computer screen) and select '**Parameters**'. You will see a window as shown at the picture.

Adjusting the anemometer WindSpeed according to the race or competition for which the wind velocity needs to be measured can simply be done by clicking the pop-up menu 'none' and dragging the mouse towards the required amount of seconds to measure or towards manual or user mode (see manual MacFinish). Then release the mouse button. For example, for a one hundred meters race, the anemometer will measure during a period of 10 seconds and for Hurdles during 13 seconds.
For a 200 m race, the measurement starts 10 seconds after the starting shot and will cover a period of 10 seconds. If the MacFinish operator wants to determine when exactly the wind speed measurement is started, he will need to select 'User Mode'. The MacFinish program foresees an icon to manually start the wind speed measurement. For this, we refer to the MacFinish manual.

4.4 WindSpeed controlled by MacFinish II SCSI or II USB (with SB)

4.4.1 Connection (see fig. 2b)

The connections of both configurations 1b and 2a are combined.

4.4.2 Operation

Results can either be read from the recorded image on your screen, from the display or from the scoreboard. The scoreboard is power supplied by the battery. The wind-gauge receives its power both from the MacFinish interface box and from the battery powering the scoreboard .

4.5 WindSpeed controlled by MacFinish II Ethernet, 2D 100 or 2D 200 (without scoreboard)

4.5.1 Connection (see fig. 3a)

The WindSpeed is connected to a 12 wire connection reel or box by means of a serial cable (P532). The WindSpeed is battery supplied.

4.5.2 Operation

The WindSpeed is operated via the MacFinish computer, which is connected to the MacFinish interface box by means of a serial cable (P244).

Same operation as 4.3.2.

4.6 WindSpeed controlled by MacFinish II Ethernet, 2D 100 or 2D 200 (with scoreboard)

4.6.1 Connection (see fig. 3b)

Same connections as fig. 3a + scoreboard and battery .

4.6.2 Operation

See 4.3.2.

4.7 Error handling

During a measurement of the wind velocity, it may occur that the measuring beam (= sonic wave between LS and MIC) is interrupted due to an object, which unexpectedly came between the transducers, or due to a bad connection at installation of WindSpeed. In case of an interruption of the sonic wave, the measuring box of WindSpeed will render a short beep tone via a built-in loudspeaker. However, the WindSpeed program is developed in such a way that this temporary interruption will be ignored in the final result, provided that the interruption does not disturb the measuring period.

4.8 Lifetime of battery

With a new 12Vdc battery (version 2010), the WindSpeed configuration can be operated for 100 hours.

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