



TENDO Sprint System

INTELLIGENT, WIRELESS TIMING SYSTEM

HARDWARE

USER MANUAL



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QUICK START GUIDE

1. Instal computer software
2. Instal TSS signal receiver driver
3. Setup the hardware
4. Start using TSS

1 ACKNOWLEDGEMENT

Thank you for purchasing Tendo product. We hope you will be satisfied with our product and customer service.

Please read the user manual fully before using the product. Save the manual for future reference. Make sure that other people using this product are familiar with the instructions.

2 SAFETY PRECAUTIONS

Do not use the device in a **damp environment** and in the **rain**.



Photocells, RFID chip reader and external display are equipped with **neodymium magnets** via which they are attached to tripods

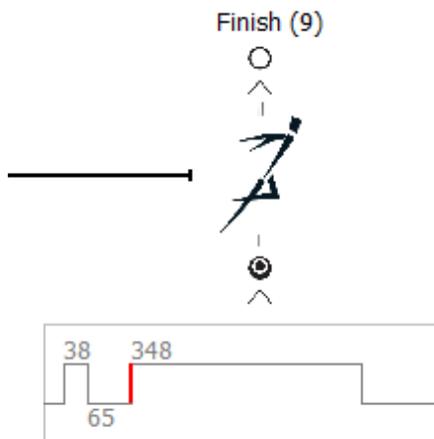
The following safety precautions must be observed during the operation with the magnets:

1. Do not put 2 magnets together
 2. When transporting devices containing magnets, use only non-metallic packages to form protection around the magnet when transporting and storing the device
 3. *Medical devices* - Some medical devices (such as pacemakers and heart defibrillators) may be affected by a strong magnetic field
 4. *Credit cards and electronic devices* - Do not place credit cards, computer disks, and other magnetic storage devices closer than 20 cm to the magnet
 5. Keep *mechanical watches, compasses* and *hearing aids* away from the magnet
- *DC and DVD media* do not carry magnetic data. Therefore, they cannot be damaged by the magnet
 - *Cameras, mobile phones* do not contain magnetically stored media. Therefore, they cannot be damaged by the magnet
 - *USB keys and memory cards* do not carry magnetic data and cannot be damaged by the magnet
 - The static magnetic field does not damage the *car keys*

3 PRODUCT DESCRIPTION

3.1 ABOUT THE PRODUCT

TENDO Sprint System (TSS) is a wireless computer system used to measure time of short distances in training and testing of athletes. Information provided by TSS is essential in sports where the performance is assessed through speed, sprint, endurance, reaction, shuttle tests, etc.



TSS is an **intelligent system**. TSS is able to recognise the interruptions of the beam caused by different body parts while **evaluating only the interruption caused by the torso** of the athlete, making it one of the most accurate systems on the market.

TSS is a highly effective training technology used for **performance evaluation** and **increase of speed** of athletes.

TSS also provides an **immediate feedback** about the athlete's performance allowing trainers to assess when it is the best time to terminate the exercise to **prevent unnecessary injuries** or when a bit of **extra motivation** is needed to get the results you want.

3.2 CONTENT OF THE BASIC TSS KIT

- (1) 2 photocells
- (2) 2 reflectors
- (3) 1 TSS signal receiver
- (4) 5 tripods
- (5) 1 manual
- (6) 1 computer software installation CD
- (7) 1 carrier bag
- (8) 2 sets of rechargeable batteries (4 pieces each set)
- (9) 2 power adapters
- (10) 3 antennas
- (11) 1 signal receiver to PC connecting cable



The kit can be expanded by purchasing more photocells and reflector pairs with tripods. Please contact your seller for more information

3.3 TECHNICAL SPECIFICATIONS

- Maximum distance between photocell and reflector is **5 m**
- Maximum distance between optogate and TSS signal receiver is **100 m**
- Accuracy of measurement: **1/1000 s**
- Maximum number of optogates for split times: **8**
- Number of communication channels: **4**
- Frequency range based on continents: **Europe, USA**

Communication Channel	Frequency Range	
	Europe	USA
0	869.6	914.6
1	869.8	915.2
2	869.6	915.8
3	869.8	916.4

4 HARDWARE SETUP

4.1 BATTERY INSTALLATION

New rechargeable batteries are already inserted in the photocell's battery compartment. The batteries are secured with a blue plastic safety strip to prevent the photocells switching on spontaneously during transport.

Before the first use, carefully pull out the blue plastic safety stripe.

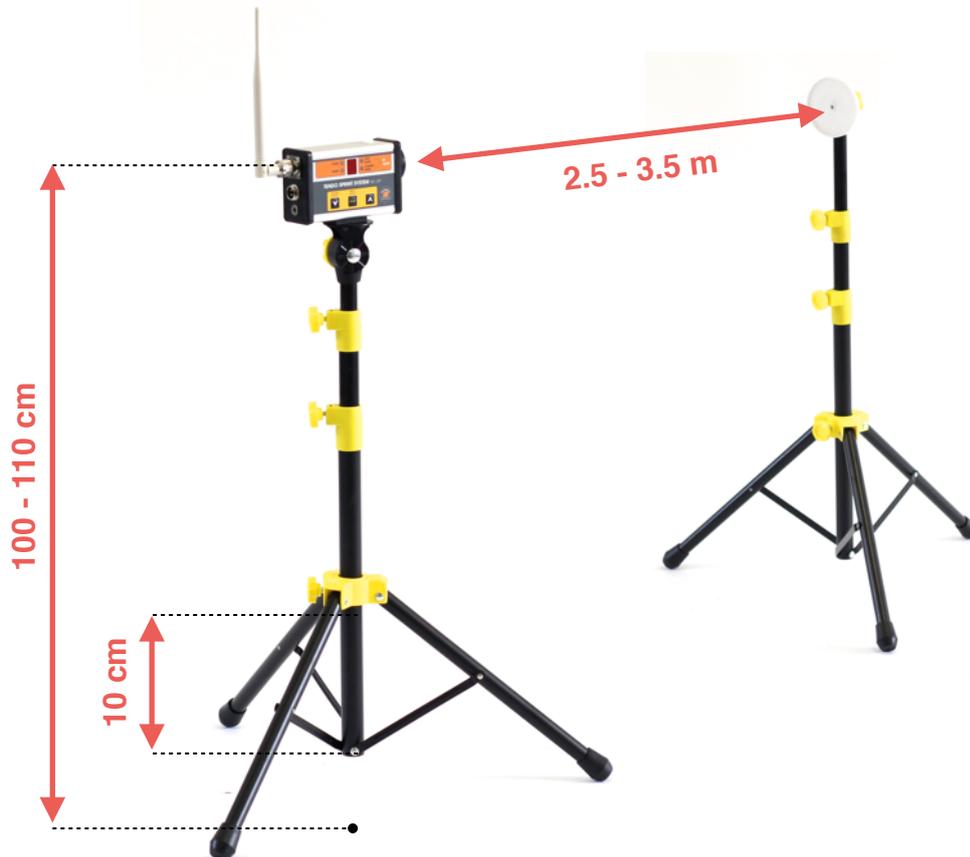
Use only rechargeable batteries type NiMH, size AA, 2000 - 2500 mAh

4.2 PHOTOCELL/REFLECTOR INSTALLATION

Photocell and reflector always form a pair. Both, photocells and reflectors, are mounted on steel tripods.

4.3 TRIPOD INSTALLATION

1. Open the tripod so the bottom yellow plastic part is approximately 10 cm from the bottom end of the tube (see the picture below). Secure the position by tightening the locking screw.
2. Screw antenna onto the top connector of the photocell (see page 8). Attach the photocell to a steel plate located on the top of the tripod via a magnet. The magnet is located on the bottom of the photocell
3. Set the height of the tripods based on your needs (We recommend placing the photocells/



reflector pairs in height of 100 - 110 cm from the ground). Make sure that the photocells and reflectors are in the same height so the beam of the photocell falls in the middle of the reflector.

Do not place photocells on the ground as the radio signal will be low.

4. Place the reflector at a distance of 2.5 - 3.5 m from the photocell (Do not exceed the 5 m distance).
- *If the photocell is switched on and the beam does not fall onto the reflector, the photocell will produce a **continuous audio signal**. Thanks to the audio signal, it is easy to align the photocells and reflectors properly (no audio signal indicates a correct alignment of the photocells and reflectors).*
 - *Each time the photocell's beam is broken an **audio signal** is produced.*

4.4 PHOTOCCELL



- (1) Menu panel
- (2) Battery compartment

There are three connectors located on the left side of the photocell:

- (3) Antenna connector
- (4) RFID reader connector for RFID chips
- (5) Power adapter connector

Optical sensor (6) and speaker (7) are located on the right side of the photocell. Fastening magnet (8) is placed on the bottom of the photocell.

On the top there is an optical signalling LED bulb (9)

4.4.1 PHOTOCCELL SETUP VIA MENU PANEL

4.4.1.1 SWITCHING ON

Press ON/OFF button (button of the left - downwards arrow) for 2 < seconds. After the long press (press and hold 2s <), you will hear a double beep and LED_power will light up. The photocell is now ready for use.



Immediately after the ON/OFF button is released, information about a current setting of the photocell is shown on a LED display for 5 seconds.

4.4.1.2 PHOTOCELL'S SETTINGS

- The setting of the photocell represents the **photocell's function**:
0 = start
1 - 8 = split times
9 = finish
- To see the **current setting** of the photocell, press the ON/OFF button (short press only). The setting will be displayed for 3s.

4.4.1.3 SETUP MENU

Use a long press of the Setup button (button in the middle - ENTER) to activate Setup Menu of the photocell.

Function of the buttons in the Setup Menu:

- *Downwards/ Upwards arrows* - to change values in the submenu
- *ENTER* - Short press - to browse in the menu
- *ENTER* - Long press - to close the setup menu and save all new settings

* If you wish to save the new settings, make sure you long press ENTER button

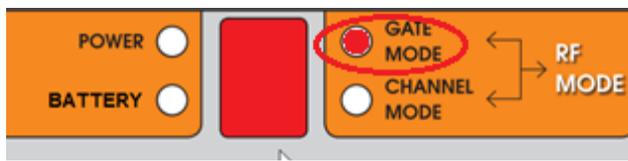
If the setup menu is activated and no buttons were pressed for more than 30s, the setup menu will be closed and the new settings will be lost.

If you are in the Setup Menu you have 3 options:

1. Change the setting of the photocell (start, split, finish) = **GATE MODE**
2. Setup the channel for communication (specific frequency) = **CHANNEL MODE**
3. Change country in which TSS is used (different frequency ranges used in different continents due to different norms) = **RF MODE**

When you open the submenu, the LED light indicates a particular setting option.

1. **GATE MODE** - choose from 0 to 9 (0 = start, 1 - 8 = split times, 9 = finish)



2. **CHANNEL MODE** - choose from 0 to 3 (see page 6)



3. **RF MODE** - E - Europe, A = USA



4.4.1.4 SWITCHING OFF

Press ON/OFF button (button of the left - downwards arrow) for 2 < seconds. After the long press (press and hold 2s <), you will hear a double beep and LED_power will turn off. The photocell is now switched off.

4.4.2 POWER AND BATTERY LED LIGHTS

Power LED

Insufficient power supply (under 4.4V) is indicated by Power LED light flashing.



Battery LED = Battery status indicator



Battery LED light - **OFF** = batteries are charged
 Battery LED light - **Flashing** = batteries need to be charged
 Battery LED light - **ON** = batteries are charging

4.4.3 BATTERY CHARGING

Each photocell has its own built-in battery charger. To charge the batteries use the power adapter which is part of the basic TSS set kit.

Power adapter parameters:

Input voltage: 110 - 230 V AC, 50 - 60 Hz

Output voltage: 12 V DC, 1,2 A

Only use rechargeable batteries: type NiMH, 2000 - 2500 mSh

Plug the power adapter into a 230V AC power outlet

Plug the power adapter connector into the bottom socket on left side of the photocell unit (see page 8)

After the charging process is turned on, the LED_battery will indicate the charging via continuous red light.

After the charging process is finished, the LED_battery will turn off.

4.4.4 BATTERY EXCHANGE

1. Open the back cover of the battery compartment
2. Insert 4x rechargeable NiMH batteries as pictured on the bottom part of the battery compartment
3. Before inserting the batteries, make sure that the batteries are correctly polarised

4.5 TSS SIGNAL RECEIVER

TSS signal receiver is used to receive data from photocells wirelessly. TSS signal receiver is connected to a computer via USB cable.

4.5.1 SIGNAL RECEIVER SETUP

Screw antenna onto the top connector of the signal receiver. Attach the signal receiver to a steel plate located on the top of the tripod via a magnet. The magnet is located on the bottom of the signal receiver

It is recommended to place the signal receiver is the same height as the photocells for a better radio signal.

A multicolour LED light is placed on the top of the signal receiver:



1. Photocell x signal receiver communication:

Photocell signalled with **GREEN** light (Power LED light)

Short flash - Photocell x receiver communication is active

Long flash - Photocell x receiver communication is not responding

2. PC x signal receiver communication:

Receiver signalled with **BLUE/RED** flashing light

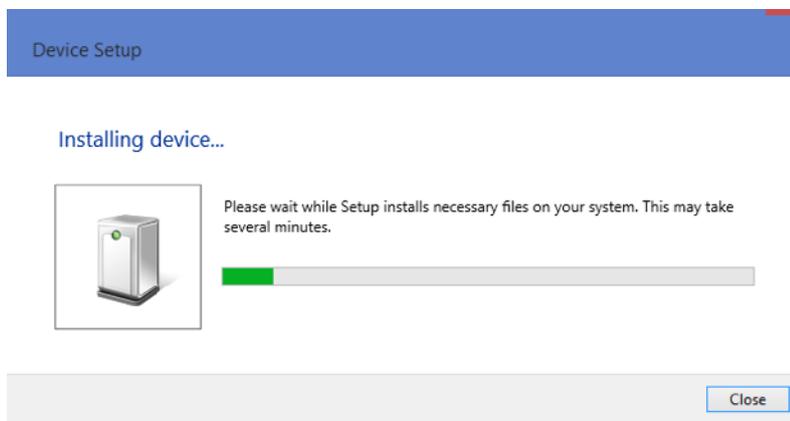
Blue flashing light - PC → signal receiver - photocell communication OK

Red - Signal receiver → Photocell is not communicating (photocell is turned off or has different communication channel)

Blue / Red flashing - one of the photocells is not responding (photocell is turned off or has different communication channel)

Before the first use it is necessary to install TSS signal receiver driver

1. Insert the USB cable into the connector located on the signal receiver
2. Insert the other end of the USB cable to a USB port on your computer
3. Your computer will recognise the new device and install the TSS signal receiver driver



Once the driver is installed the system is ready for use