TENDO Sprint System

INTELLIGENT, WIRELESS TIMING SYSTEM

Hardware

User Manual

model: TSS-217

CONTENT

QUICK START GUIDE

1. Install computer software
2. Install 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 display board 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 thought speed, sprint, endurance, reaction, shuttle tests, etc.
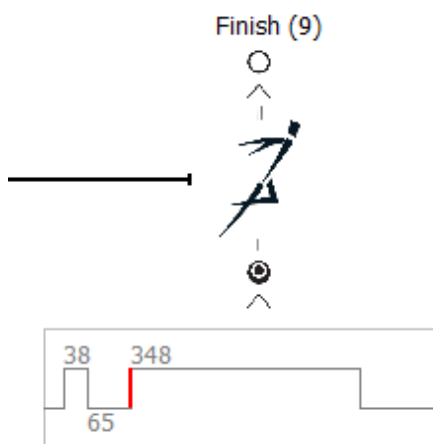
TSS is an **intelligent system,** which uses **error correction processing** technology that was found to eliminate false triggers completely. TSS is able to recognise the interruptions of the beam caused by different body parts while **evaluating only the interruption caused by the torso** of the athlete. Making it one of the most accurate systems on the market, outperforming single-beam and even double-beam systems.

Turn Error Correction Processing ON/OFF based on your training needs.
When the Error Correction Processing is turned off, the first event is taken into account. Use it in training with athletes using rackets, hockey sticks, bikes, wheelchairs…

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 athletes 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 photocell and TSS signal receiver is **100 m**
- Accuracy of measurement: **1/1000 s**
- Maximum number of photocells for split times: **8**
- Number of communication channels: **4**
- Frequency range based on continents/countries: **Europe**, **USA, China, India, AU AS (Australia, New Zealand, Indonesia, Hong Kong, Japan, Malaysia, Taiwan, Thailand, Singapore, Vietnam)**

Communication Channel	Frequency Range				
	Europe	USA	China	India	AU AS
0	869.6	914.6	868.0	865.2	921.2
1	869.8	915.2	868.2	865.8	922.4
2	869.6	915.8	868.4	866.4	923.6
3	869.8	916.4	868.6	867.0	924.8

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 plastic safety strip to prevent the photocells switching on spontaneously during transport.

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

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

4.2 Photocell/reflector installation

A photocell and a 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 25 cm from the bottom end of the tube (see the picture below). Secure the position by tightening the locking screw.
2. Attach the photocell to a steel plate located on the top of the tripod via magnet located on the bottom of the photocell.
3. Screw antenna onto the top connector of the photocell (see page 8). But not tighten the nut yet! Set the antenna to the perpendicular position first, then tighten the nut.

   !! If you tighten the nut before the antenna is set to the correct position, it could cause damage to the antenna !!

4. 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.

5. Place the reflector at a distance of 2 - 5 m from the photocell (Do not exceed the 6 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 alight 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 and the optical signalling LED bulb (9) will be lit.*

4.4 Photocell
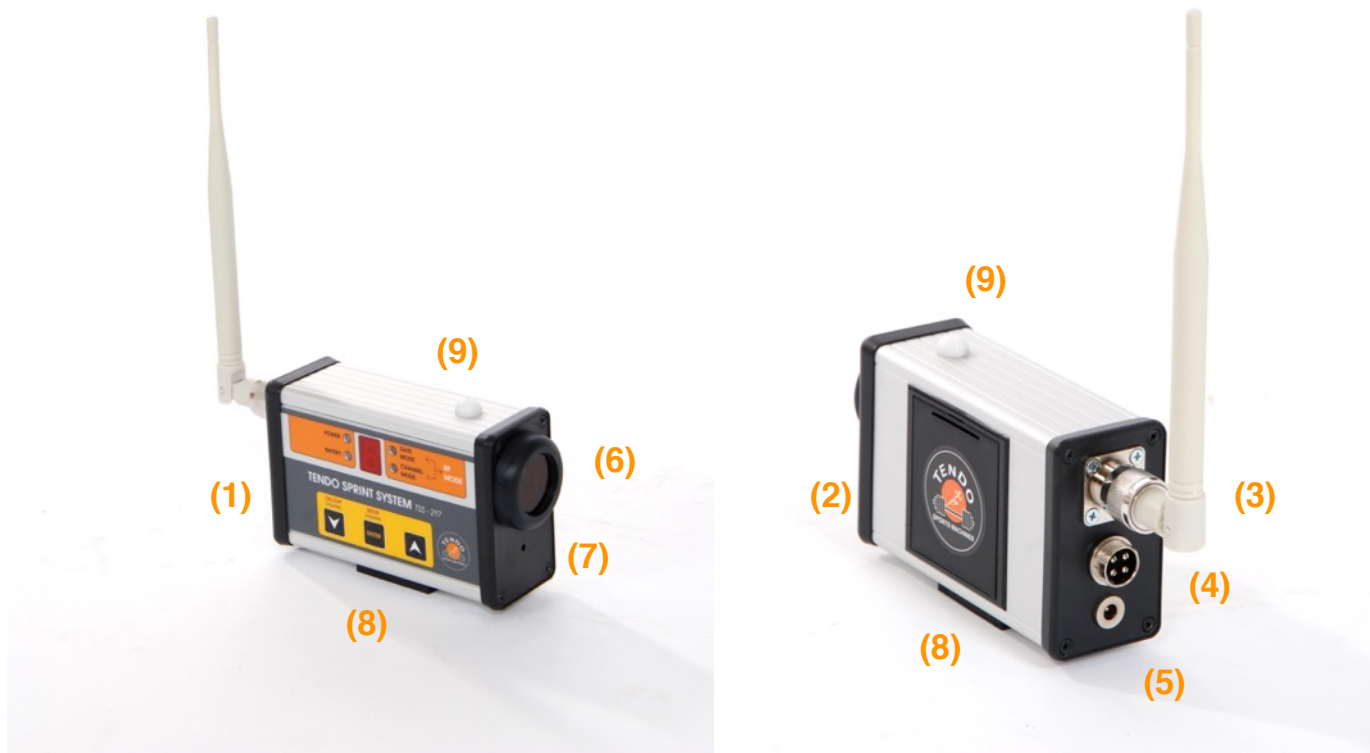
(1) Menu panel
(2) Battery compartment

There are three connectors located on the rear side of the photocell:
(3) Antenna connector
(4) Connector for RFID reader
(5) Power supply adapter connector

Optical sensor (6) and speaker (7) are located on the front 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 Photocell 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 ready for use now.

Immediately after the ON/OFF button is released, information about a current setting of the photocell is shown on the 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 anytime (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:
- *Down/ Up button* - 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 are used in different continents/countries due to different norms) = RF MODE

When you open the submenu, the LED light indicates a particular setting option.
To change settings use Up or Down buttons.

1. GATE MODE - choose from 0 to 9 (0 = start, 1 - 8 = split times, 9 = finish)
It is possible to use any photocell number for start, finish and split times. However, it needs to be synchronised with the gate setting in the Tendo Sprint System computer software (the same number for start, finish and split times).

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

3. RF MODE - E - Europe, A - USA, C - China, I - India, U - Australia, New Zealand, Indonesia, Hong Kong, Japan, Malaysia, Taiwan, Thailand, Singapore, Vietnam (option)

!! Use the selected Radio Frequency only in a country where the particular frequency is allowed !!
!! *Do not use the radio frequency not allowed in the country of the system location* !!

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

If the photocell is turned on and the system is not connected to the computer software, Power LED light lit continuously with a green light.
If the photocell is turned on and the system is connected to the computer software, Power LED light flashes with green light.

Insufficient power supply (under 4.4V) is indicated by Battery LED light flashing with orange light and the batteries need to be charged.

If the power supply adapter is plugged in and the charging progress began, the Battery LED light lit continuously with orange light.
After the batteries are fully charged, the Battery LED light is turned off.
Battery LED = Battery status indicator

Battery LED light - OFF = batteries are charged
orange Battery LED light - Flashing = batteries need to be charged
orange 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 light will indicate the charging via continuous orange light and LED display shows "c" for 2 seconds..
After the charging process is finished, the orange 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

4.4.5 OPTICAL SIGNALLING LED BULB

1. *If the photocell is turned off or on but not connected to the TSS computer software,* the optical signalling LED bulb (9) located on the top of the photocell unit is turned off.
2. *The photocell is turned on and connected to the TSS computer software.*
      - the optical signalling LED bulb lit continuous red light along with a high frequency audio signal = photocell beam between the photocell and the reflector is interrupted or the beam is out of the reflector

- the optical signalling LED bulb flashes red light along with flashing Power LED light = indicates correct communication between the photocell unit, receiver and TSS computer software (after the "Click to Connect" button in the TSS computer software was activated).

4.5 TSS signal receiver

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

4.5.1 Signal receiver setup

Screw antenna onto the top connector of the signal receiver and tighten the antenna nut. 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. Blue flashing light = active and correct communication with all turned on photocells.

2. Blue/Red flashing light = at least one of the photocells in not communicating with the TSS computer software (e.g. the photocell is turned off or the communication channel, frequency range or the photocell number does not correspond to the setting in the TSS computer software)

3. Red continuous light = After clicking "Connect" in the TSS computer software, the continuous red light indicates no communication between the signal receiver and the photocells (e.g. the photocells are turned off).

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
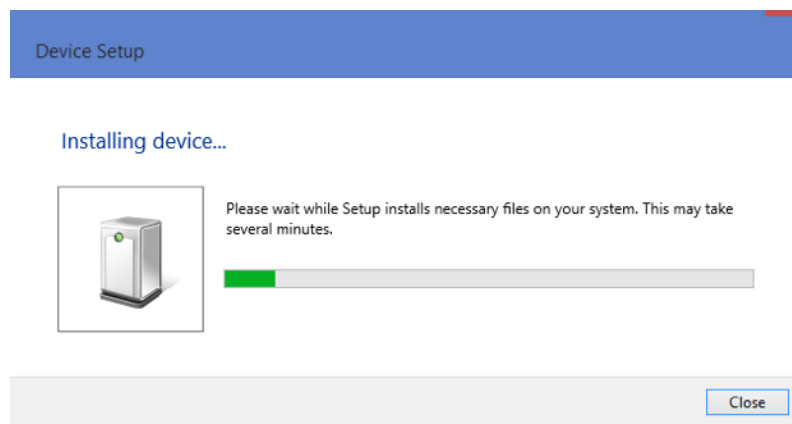
Once the driver is installed the system is ready for use

 @tendosport_official

 TENDO Sport
@tendosportsmachines

 @tendosport

 Tendo Sports Machines
@TendoSport

Manufactured in Europe.

TENDO Sport

Zlatovska 22

911 01 Trencin   Phone / fax : 00421-32-6401500

Slovak Republic   e-mail: tendo@tendosport.com

www.tendosport.com   13