



WITTY

WIRELESS TRAINING TIMER

User Manual

Manual version 1.2.1

Firmware version 2.20.54

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1 DEVICE FUNCTIONS AND MAJOR FEATURES

WITTY is a training timing system ideal for all sports where assessing athletic performance through sprint, speed, endurance, reaction, shuttle tests, etc. is essential.

Thanks to the timer and photocell-integrated radio system (which do not require special official authorization), the large color display, the modern user interface featuring icons, and the practical padded backpack, setup and use is extremely easy and fast.

The system is largely expandable with the possibility to add (single or double) photocells for intermediate times, accessories such as starting pads, time displaying LED boards, direction indicators, etc.

The kit comes with a free Windows software (which can be downloaded from our website) called *Witty Manager* for importing data of performed tests and viewing it in numerical tables and graphs, managing a complete athlete personal data base (transferring the athlete's picture to the timer for fast identification), creating customized test types and updating the timer and photocell firmware.



1.1 CONTENTS OF THE KIT

Basic kit (art. £WIT001):

- 1 Witty timer
- 2 photocells
- 2 reflectors
- 4 tripods
- 1 backpack
- 1 wall power supply (with 4 different plugs for all world standards) + 3 USB cables for charging the timer and 2 photocells simultaneously
- 1 USB-PC cable
- 1 USB memory stick containing Witty manuals and Witty manager software
- 1 cord

The kit can be expanded purchasing more photocell and reflector pairs with tripod ('Lap Time Kit', art. £WIT002) for managing more lap times.

Both kits (Basic and Lap Time) are available with a 'Double Photocell' option (see chapter 2.4; the relevant article codes are £WIT003 and £WIT004)



2 MAIN FUNCTIONS

2.1 WITTY TIMER

The figure below shows the main parts of the Witty timer, which will be explained hereafter.



2.1.1 SWITCHING ON

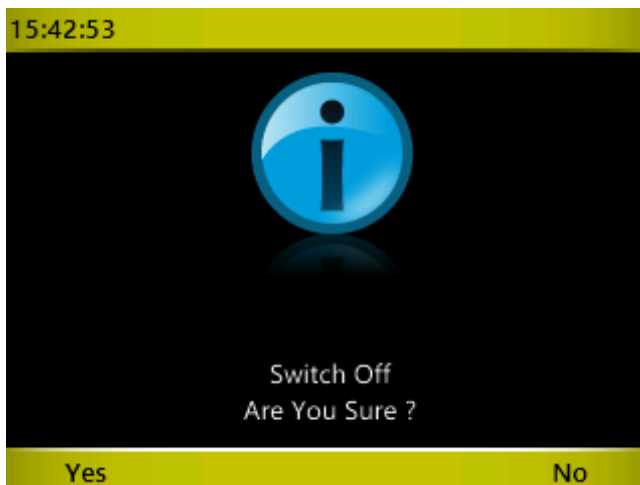
To switch on the Witty timer press the **<Microgate> key**. After a few seconds required by the boot loader, a screen is displayed showing the installed firmware version. Press any key to go to the Main Menu.



2.1.2 SWITCHING OFF

From any screen press the **<Microgate> key** and hold it **for 5 seconds**.

Another screen prompts to confirm switching off the timer. Press **<F1>** to confirm or **<F4>** to cancel.



2.1.3 RESET

If the timer does not respond to any command, press the **<Microgate> key** and hold it for **at least 10 seconds**. When the key is released, the device will be reset and switched off. Press the key again to switch on.

2.2 PHOTOCELLS



To **switch on** the photocell press the ON button for one second; the status LED blinks with a green light (if the battery status is sufficient) or with an orange light (if the battery status is low). A continuous beeping sound is produced until the **correct alignment** with the reflector (or a similar reflecting surface) is found.



To **switch off** the photocell press the button until the LED turns red, then release it.

2.2.1 MOUNTING PHOTOCELLS AND REFLECTORS ON TRIPODS

To mount the photocells and the reflectors on the tripods supplied with the kit, proceed as follows: remove the little platform from the top of the tripod and screw it onto the photocells and under the reflectors (the platform is square-shaped and therefore allows 4 mounting directions with respect to the tripod). Mount the devices onto the top of the tripod inserting the front of the platform, and then the rear until the tab clicks into place.



Extend the tripod legs until the required height has been reached (usually the photocell must be interrupted by the chest of an athlete), and position the photocells and the reflectors at a distance of 1-7 meters (see also chap. 5.4.1.3 on setting 'Normal' or 'Strong' mode depending on the position).



2.2.2 LED STATUSES AND COLORS

PHOTOCELL OFF	
STATUS	STATUS LED
Battery charged/empty	Off
- External supply - Battery charging	Orange blinking light
- External supply - Battery charging completed	Green steady light
PHOTOCELL ON	
STATUS	STATUS LED
NORMAL Mode - Battery charged - Battery empty	Green - Pause Red - Pause
BOOTLOADER Mode The photocell has not been switched on pressing the ON/OFF button but by connecting the USB cable to a PC. This activates the BootLoader HID and the firmware can be updated.	Red - Green
CONFIGURATION Mode When switching on, the ON/OFF button is pressed for at least 5 seconds and configuration mode is activated.	Red blinking light

PAIRED PHOTOCELL Mode:	
Master photocell (higher serial number)	
- Battery charged - Battery empty	Green - Pause Red - Pause
Slave photocell (lower serial number)	
- Battery charged - Battery empty	Green fast blinking light Red fast blinking light

2.2.3 PAIRED PHOTOCELLS

To prevent the photocell being interrupted by an athlete's arm swinging forward, in official competitions or in any case when measurement must be as accurate as possible, the use of paired photocells is necessary.

This setup ensures that time is measured exactly when the athlete's chest crosses the line, as the impulse (start/stop/lap, depending on the position) is given only when both photocells are interrupted.

To mount the photocells, screw the C bracket onto the tripod platform, the photocells, and the reflectors, as shown in the figure (the photocells are mounted at 90° with respect to the C bracket).



Then mount the bracket onto the tripod and connect it with the photocells using the jack-jack cable. The **MASTER** photocell is the one with the higher serial number (see chap. 5.4.1.1) and blinks more slowly than the **SLAVE**. As the Master photocell transmits the signal to the timer, to ensure a wider aerial range, the latter should always be mounted on top.



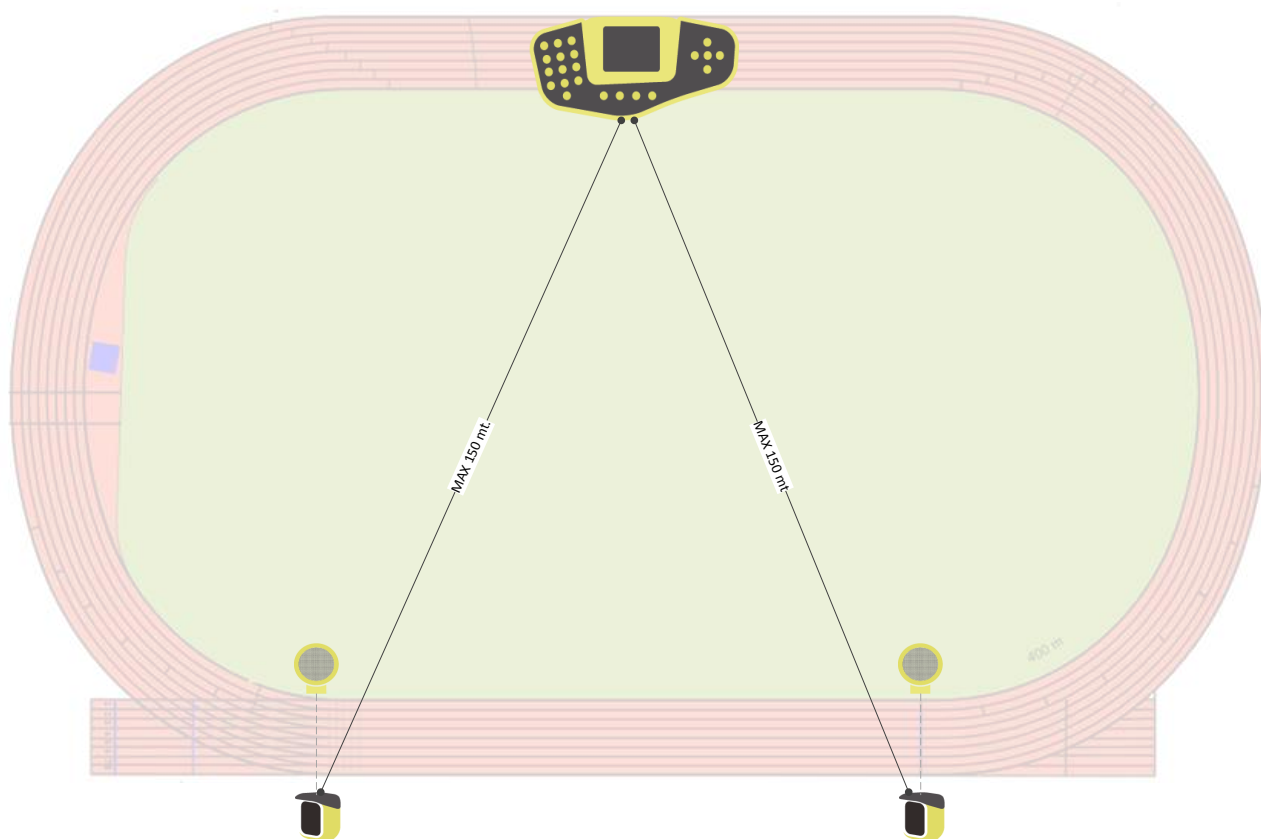
Master:
Higher S/N,
blinking at regular
speed.
Always on TOP!

Slave:
Lower S/N,
blinking fast.



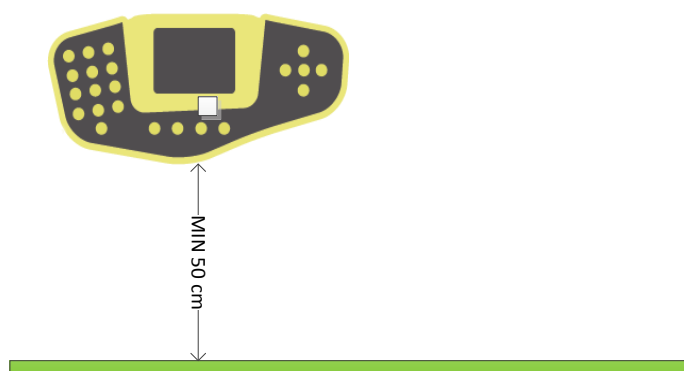
2.3 RADIO TRANSMISSION

The suggested maximum distance to keep in order to prevent reception problems is 150 meters. It is in any case advisable to check the signal quality with the procedure described in chapter 5.4.1.1.



In **case of rainy weather** radio transmission can be disturbed by the water drops and therefore the maximum distance must be reduced.

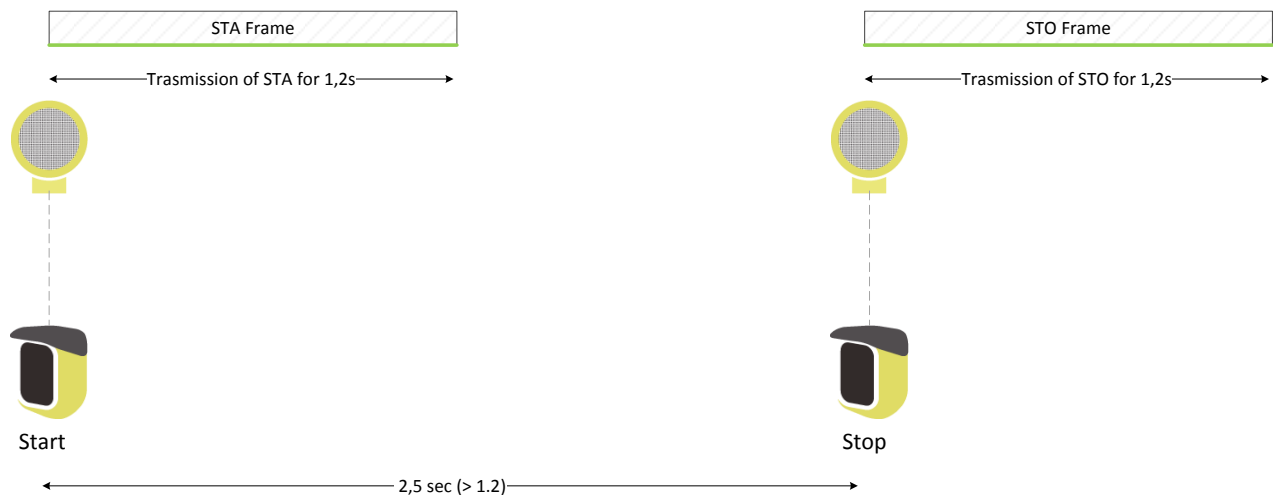
In order to obtain excellent reception, position the Witty timer at a **height of at least 50 cm** (without touching the ground) and **do not place it on top of metal objects**.



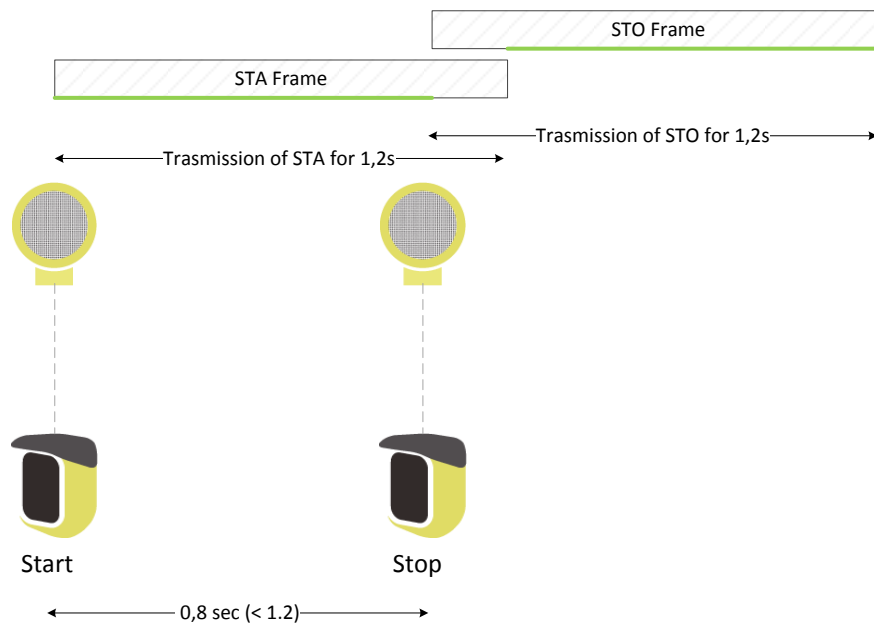
2.3.1 TRANSMISSION IMPULSE DURATION (RADIO POWER)

To increase the reliability of the radio transmission, the data bundles of the photocell impulses are transferred repeatedly for a set period of 1.2 seconds. This allows to have redundant information when losing some data bundles and to rebuild the event with absolute precision.

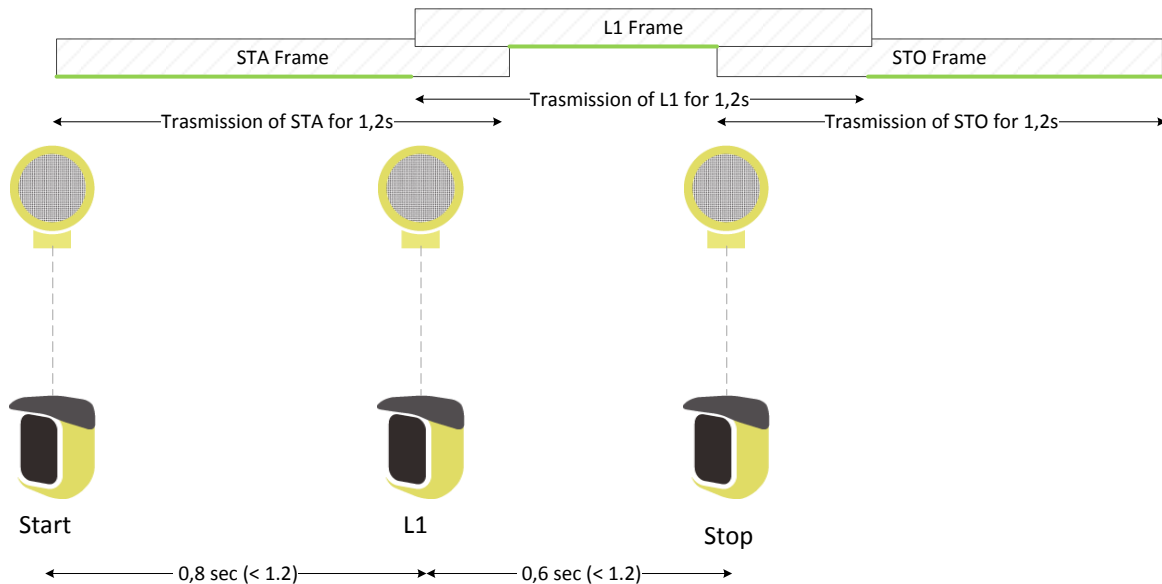
If between two impulses (e.g. start photocell and stop photocell) more than 1.2 seconds elapse, there are of course no problems whatsoever.



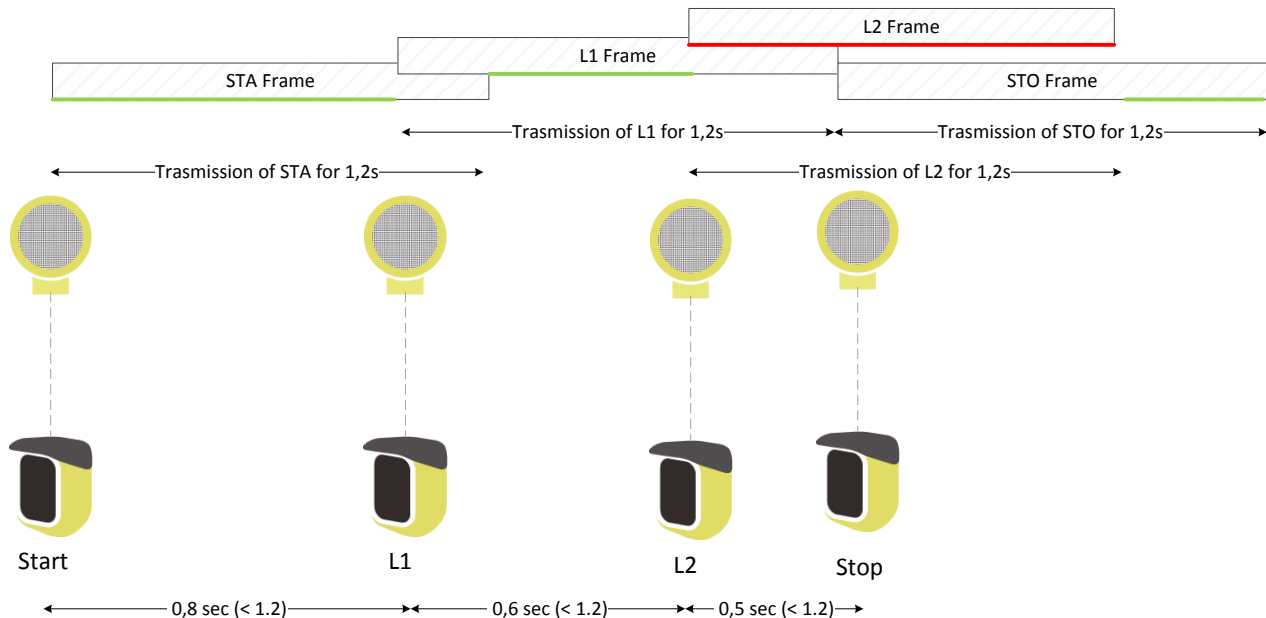
Even if the difference is smaller, the second impulse will still be detected, as it will always have a longer "tail" than the first one.



Problems may arise when intermediate (Lap) times are added and are very close one to another or between start and stop. Once again it is not necessary that the impulse delta is higher than 1.2 sec, it is enough if the impulse has a "period" (green line) where there are no other impulses.



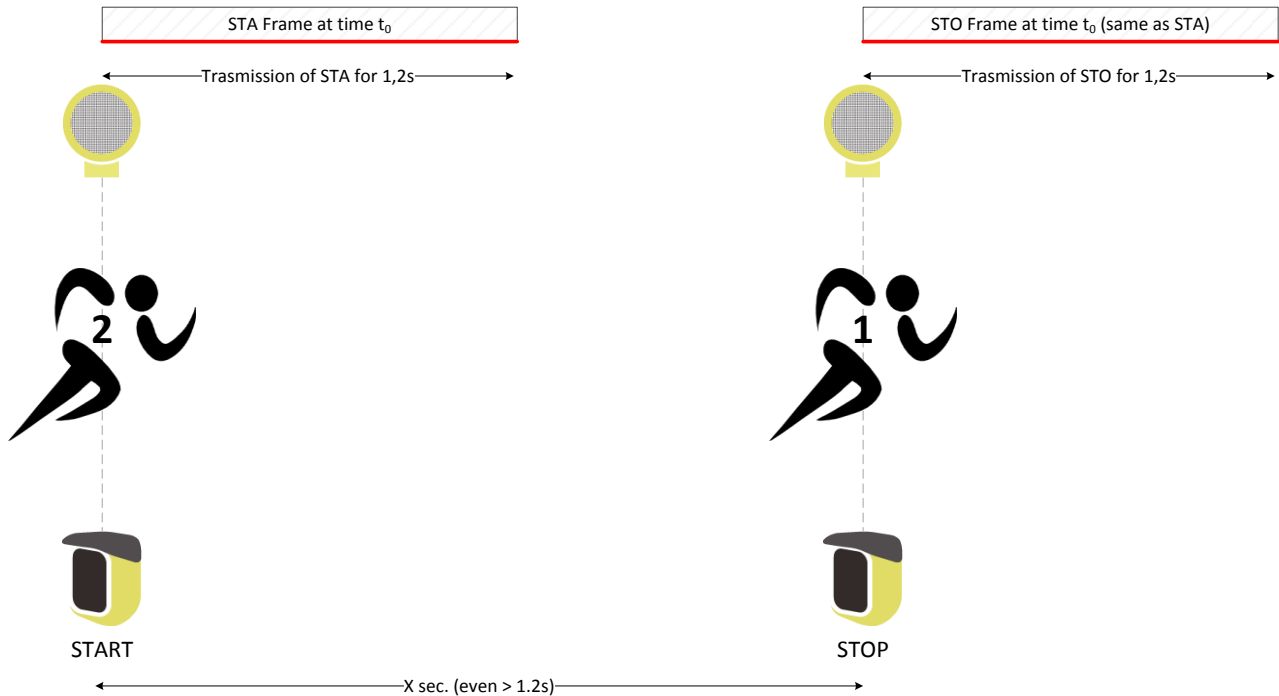
If on the other hand there are several and very close intermediate times, one of these might be "completely" covered by the previous or following impulses (as in the case of L2 in the figure below), and therefore it would not be detected.



To minimize this problem in case of very fast passages between one photocell and another, the transmission time can be reduced by one third, i.e. from 1.2 sec to 0.4 sec (see chap. 5.4.1.3.2).

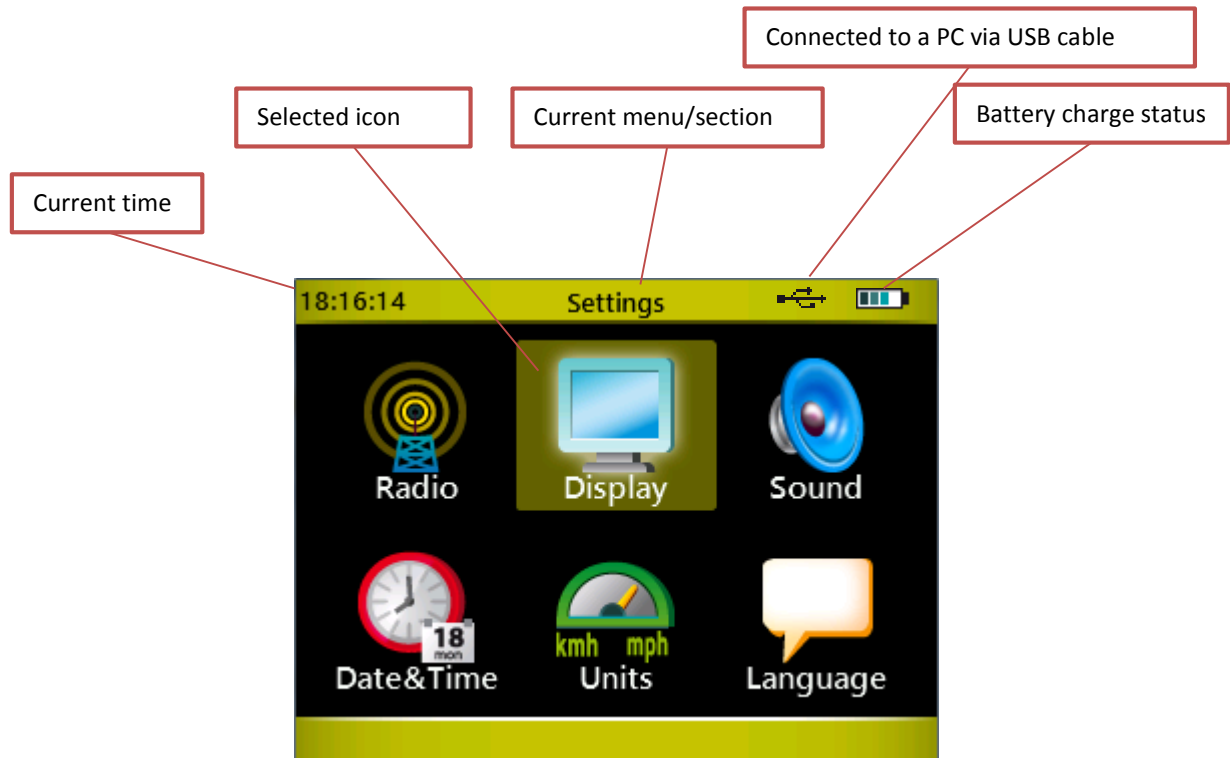
In this case the duration of the impulse transmission is very short and allows a closer setup of the photocells, but with lower transmission reliability (as fewer redundant bundles are sent). It is advisable to use this mode (Radio Power = Short) only with the Witty timer close to the photocells and in ideal usage conditions (see chap. 2.3).

In any case, regardless of the impulse distance, if two impulses are *perfectly* simultaneous (to the millisecond), one of them will necessarily be lost. For instance, in a multistart test, where the athletes start while others are on the circuit, if one athlete's stop occurs exactly at the same time as the another athlete's start, one of the signals will not be detected.



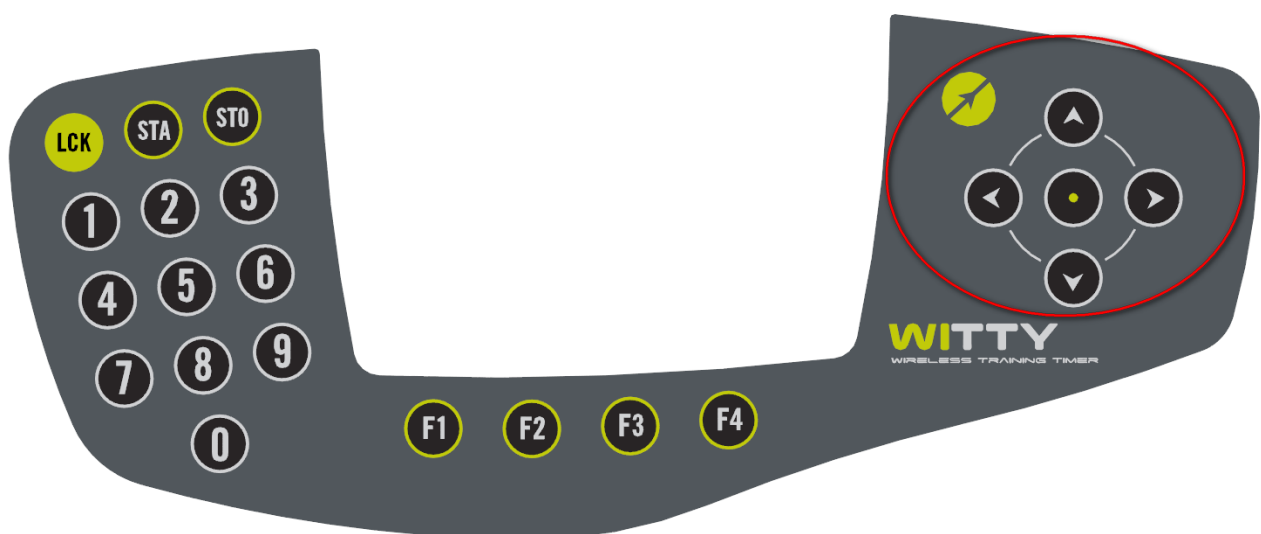
2.4 ELEMENTS OF THE GRAPHICAL USER INTERFACE

The Witty timer features an interface with icons and commands similar to those used in modern mobile phones and smartphones. Let's take a look at the main icons and how to use them.

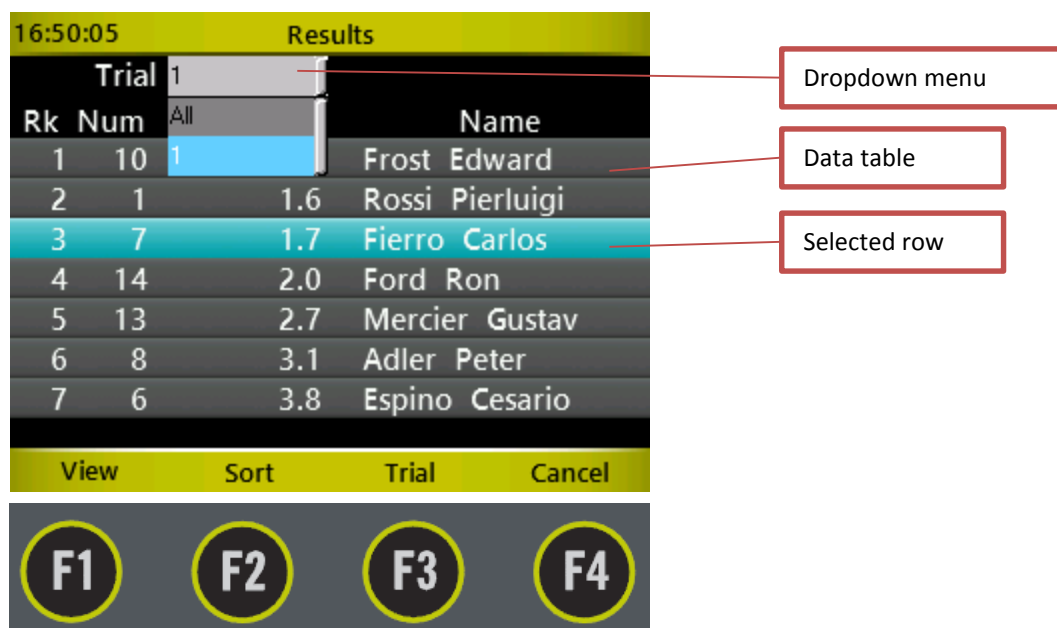


To browse the menus, use the four keys of the *<keypad navigator>*. When the icon of the required command is selected (icon outlined in yellow), press the center *<Confirm/OK>* key to access the relevant function.

To go back to the previous screen or in any case when the regular BACK or ESC function is needed, press the *<Microgate>* key.



When **commands** are shown in the lower part of the display (inside the yellow portion), they can be selected using the corresponding *<function key>*



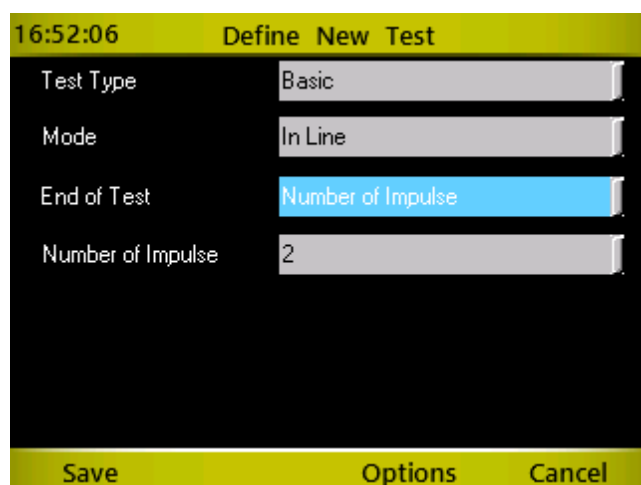
The screenshot shows the 'Results' screen with a timer at 16:50:05. It features a data table with columns: Trial, Rk, Num, and Name. The third row is highlighted in light blue. Annotations point to the dropdown menu for the 'Trial' column, the data table itself, and the selected row. Below the table are function keys F1, F2, F3, and F4.

Trial	Rk	Num	Name
1	10	1	Frost Edward
2	1	1.6	Rossi Pierluigi
3	7	1.7	Fierro Carlos
4	14	2.0	Ford Ron
5	13	2.7	Mercier Gustav
6	8	3.1	Adler Peter
7	6	3.8	Espino Cesar

If the **Data Tables** consist of one or more columns, the rows can be scrolled with the *<up>* and *<down>* arrow keys; the selected row is then highlighted in light blue. Press the *<OK>* key or one of the *<Fn>* keys to interact depending on the context. Pressing the *<right>* and *<left>* arrow keys has the same effect as the PgDn and PgUp keys on a PC, i.e. the list is scrolled down by pages.

In order to open a **dropdown list**, press the relevant function key (in this case *F3* labeled 'Test') or the *<up arrow key>*; the dropdown menu opens showing all elements, which can be scrolled using the *<up>* and *<down>* arrow keys, and the required item confirmed with *<OK>*.

On screens having more than one dropdown menu, use the *<up>* and *<down>* arrow keys to select the desired dropdown menu, then press *<OK>* to open it. Again use the *<up>* and *<down>* arrow keys to scroll the items, and finally confirm the selected item by pressing *<OK>*.



The screenshot shows the 'Define New Test' screen with a timer at 16:52:06. It has four input fields: Test Type (Basic), Mode (In Line), End of Test (Number of Impulse), and Number of Impulse (2). The 'End of Test' field is highlighted in light blue. At the bottom are buttons for Save, Options, and Cancel.

16:53:29 Radio Channel

Channel #:

Insert a number between 1 and 8

5

Save Cancel

16:54:33 Set Date

Date 18 / 9 / 2012

(DD/MM/YYYY)

Save Cancel

If you need to **type a number**, the cursor is automatically positioned inside the field. Use the *<numeric keypad>* to enter the required number, and confirm with *<F1>* (Save) to save the data.

If there are several numeric fields (e.g. date or time input) confirm with *<OK>* in the various fields to go to the next one.

As there is no delete (Del/Backspace) key, in case of mistakes just retype the number. Depending on the context, the fields accept a finite number of digits (e.g. for a date only 2), so the entered data overwrites the previous one.

e.g. If you want to enter the number 18 in the day field, but you have typed 81, just type 18 again and you will obtain the following results:

Date 81

(DD/MM/YYYY)

press 1

Date 11

(DD/MM/YYYY)

press 8

Date 18

(DD/MM/YYYY)

For selecting items having **exclusive selection buttons (radio buttons)**, proceed as follows: with the *<up>* and *<down>* arrow keys select the required item, which turns light blue; press *<OK>* to set the option.

If you want to change the language from Italian (currently selected option) to Spanish

17:05:02 Language

Select:

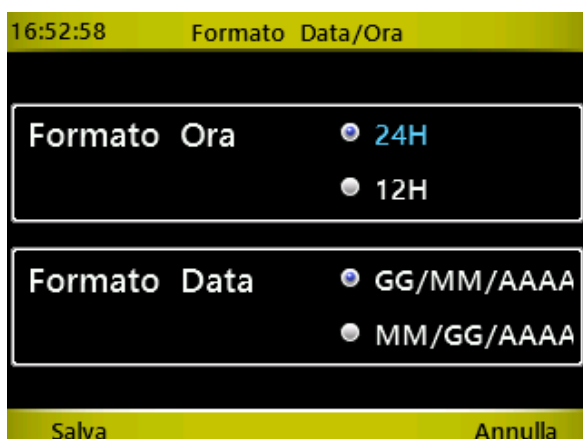
- ☒ English
- ☐ Italiano
- ☐ Deutsch
- ☐ Française
- ☐ Español
- ☐ Chinese
- ☐ Japanese

Save Cancel

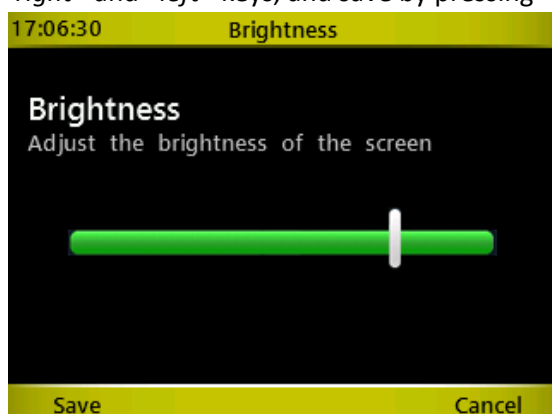
Move the cursor until the item is highlighted in light blue and press *<OK>*.

Remember to SAVE by pressing *<F1>*

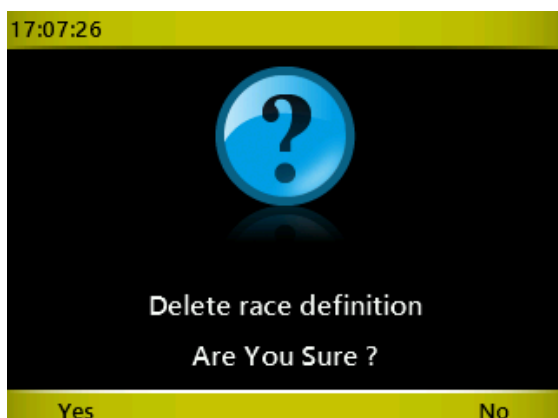
In case of **various radio button groups** on the same screen, follow the same steps.



If there are control items such as **sliders** (e.g. for setting the display brightness), move the arrow using the **<right>** and **<left>** keys, and save by pressing **<F1>**



As you might have already noticed from these screens, the **<F1>** and **<F4>** keys are often the opposite of each other and in general it is true that the **<F1>** always corresponds to Confirm, Save, Yes, whereas **<F4>** is used for Cancel, Back, No. Mainly in prompts requiring confirmation it is common to use **<F1> = YES** and **<F4> = NO**.



2.4.1 VIRTUAL KEYBOARD

After having defined a customized test type (see chap. 5.1.4) it can be named using the virtual keyboard.



Use the four <arrow> keys to hover over the required letter (highlighted in light blue) and press <OK> to enter.

Use the shift key (↑) to toggle between capital and small letters. Pressing it once, only the first letter is capital (e.g. the first letter of the name), whereas by pressing the <OK> key twice, the CAPS-LOCK function is enabled (all capital letters).



In order to delete a mistyped letter, press BackSpace 

2.4.2 THE START (STA) AND STOP (STO) KEYS

In the top right corner of the timer there are the STA and STO keys simulating the events recorded by the photocells set as start and stop. These impulses can be given manually to:

- start a test manually giving the first impulse and then manage the following using the photocells (e.g. a counter test, where only one photocell is used to count repetitions)
- generate a lap time when the athlete passes in a certain point when using 2 photocells (press the STA key, which is also used as LAP)
- end a test manually, if for some reason an athlete has not interrupted the photocell (passing too close to or below it)
- 'play' with the timer learning how to use it in manual mode



2.4.3 THE LOCK KEY (LCK)

The Lock key interrupts radio impulse reception by the photocells and the inputs from the 3.5 mm jack. The keyboard (and therefore also the STA and STO keys) remain enabled.

If, for example, an undesired person is crossing the finish line (a judge, another athlete, etc.), reception can be interrupted simply by pressing the <LCK> key

A padlock on the header bar indicates that the timer's reception is 'locked'; to reactivate it press the <LCK> key again.



2.4.4 ICONS ON THE HEADER BAR

The top part of the timer (Header bar) displays the current time, as well as the a series of icons relevant to the current screen:



	Battery charged 100%
	Battery charged 75%
	Battery charged 50%
	Battery charged 25%
	Battery running low
	This indicates that the battery has been charged completely and the timer can be disconnected from the PC or the wall power supply.
	When charging, the battery gets very hot. Disconnect from the power supply and wait until it has cooled down.
	The timer battery is being charged via the PC or wall power supply.
	The timer is connected to the PC via USB cable.
	The LCK key has been pressed and photocell impulse reception, as well as 3.5 mm jack reception are disabled.

2.5 POWER SUPPLY AND CHARGING

When the device batteries are low they can be recharged simultaneously for as many as 4 devices.

The Witty Timer battery icon level decreases with the decreasing battery charge and turns red when the battery is almost empty.



Low battery charge on the photocells, Witty-SEM and Witty-RFID is indicated by the RED-PAUSE status LED (see chap. 2.2.2).

To recharge them use the power supply and connect the plug that is compatible with your national grid format (Europe, UK, USA, Australia). Connect the USB cables to the power supply and the devices to charge.



The plug icon on the Witty Timer next to the battery icon indicates the charging progress.



On the photocells, Witty-SEM and Witty-RFID (if switched off), the status LED turns orange and blinks.

Both devices can be charged connecting them both to a PC, but charging takes longer (480 mW instead of 800 mW of the wall power supply).

2.6 WITTY·RFID



Witty·RFID is an automatic athlete detection system that makes the trainer's work easier by not having to insert the bib (or shirt number) of the person who is starting in the Witty timer.

The player, supplied with a previously configured bracelet/watch, will simply approach the RFID reader located near the start and his name, number and photo will automatically appear on the timer display (this information is managed and downloaded via the Witty Manager software).

An acoustic beep and a series of green LEDs that light up indicate that the data was received and read correctly.

The washable rubber silicone bracelets have a white space on the "face", where the assigned number can be written after programming. Programming is done using the Witty Manager software (refer to the Witty Manager software manager, chapter 3.1.4, for more information) and the same RFID reader that is connected via USB to a PC.

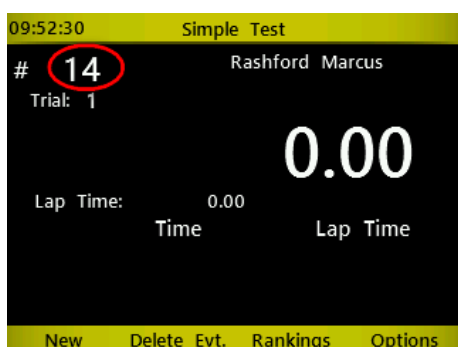
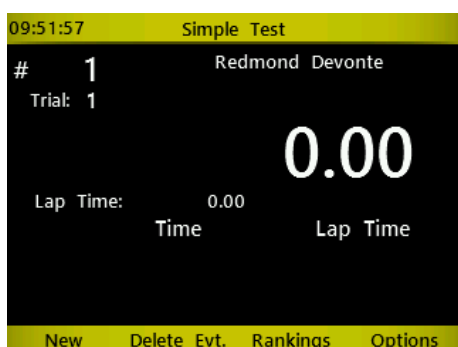
With Witty·RFID, timing is therefore completely automated, the coach/trainer does not have to do anything on the timer and can therefore concentrate on the athletes, following them during the test.

2.6.1 BASIC OPERATION

Place the Witty timer in start mode in any one of the test types (e.g. the basic test described in the chapter 3). Instead of entering the number of the starting contestant, bring one of the bracelets (which was previously “numbered” with the Witty Manager software) to a distance of approx. 2 cm. from the Witty-RFID.

The LEDs on the reader will light up green and an acoustic signal confirms that the scan was successful. The bib number is transmitted via radio to the Witty timer, which sets it immediately for starting. The maximum distance of the timer and the optimal radio transmission conditions are the same as described in chapter 2.3.

When the proximity sensor detects any object, the 5 front LEDs turn blue, whereas if a bracelet comes near it that has not been “numbered” yet or if there is a RFID chip reading error, the LEDs turn red.



ON/OFF button

Status Led

USB connector for charging
and updating the firmware

3.5 mm jack, not used

2.6.2 LED STATUSES AND COLOURS

FRONT LEDS	
STATUS	STATUS LED
Bracelet with bib number detected	Green
Bracelet without bib number detected or scanning error	Red
Non RFID obstacle detected	Blue
REAR LED	
Witty-RFID OFF	
STATUS	STATUS LED
Battery charged/empty	Off
- External power supply - Battery charging	Orange blinking light
- External power supply - Battery charging completed	Green steady light
Witty-RFID ON	
STATUS	STATUS LED
NORMAL mode - Battery charged - Battery empty	Green - Pause Red - Pause
BOOTLOADER Mode Witty-RFID has not been switched on pressing the ON/OFF button but by connecting the USB cable to a PC. This activates the BootLoader HID and the firmware can be updated.	Red - Green
CONFIGURATION mode When switching on, the ON/OFF button is pressed for at least 5 seconds and configuration mode is activated	Red blinking light



2.7 WITTY·SEM



Witty·SEM is an innovative training and rehabilitation system that can be scaled and configured in a simple and quick manner to meet different needs. Witty·SEM is basically a traffic light integrated with other products of the Witty family, consisting of a 7x5 LED matrix that is able to manage different contents, such as:

- Colours: Red, green and blue
- Arrows in different colours
- Numbers
- Letters

Witty·SEM is centrally controlled by the witty timer via a radio transmission system with a range of up to 150 m, which makes it possible to model the different types of training and analysis in a completely flexible and reliable manner. Up to 16 traffic lights can be managed from a single Witty console with data acquisition in real time.

Witty·SEM makes it possible to train and test athletes regarding specific movements depending on the different types of sports or requirements, targeting their cognitive-motor skills and abilities in order to prepare them.

Witty·SEM can be used in two different ways:

- As a **start traffic light and countdown** in all available Basic, MultiStart and Counter tests (see chap. 4.1.1.1); usually only one Witty·SEM is used
- As a training system for **Agility or Direction Change tests**, between 1 and 16 can be used (see chap. 4.4)

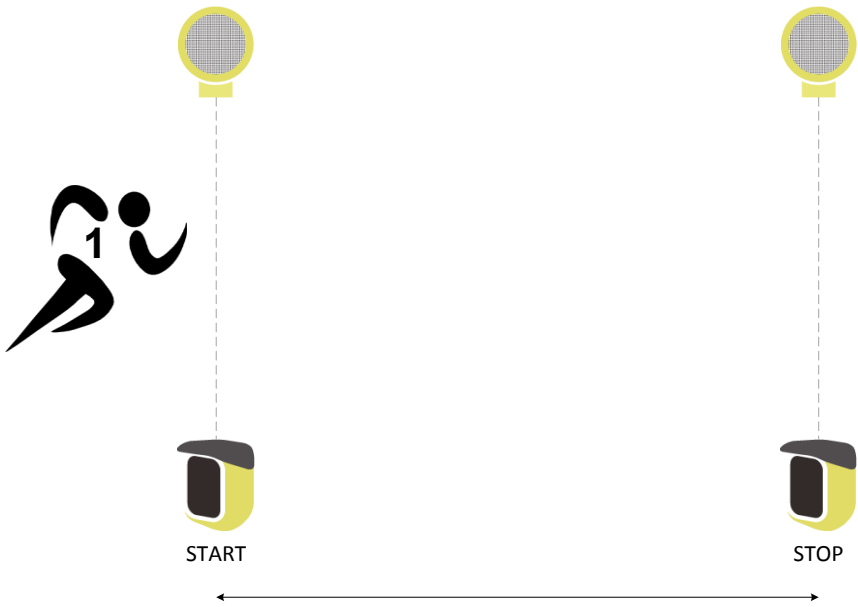
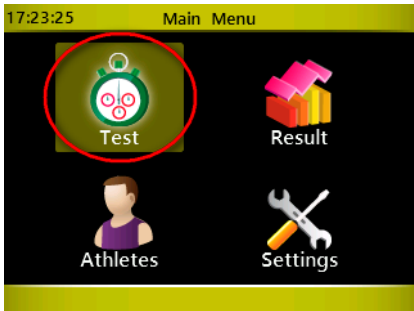
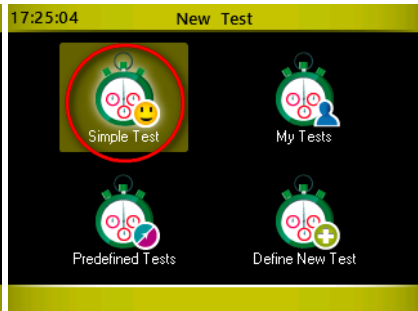
If you have more than one traffic light available, the first thing to do is to make sure that each has been configured with a different address (from A to R). The address can be seen directly on the traffic light right after it is turned on.

It is configured using the Witty Manager software (see the Software manual in chapter 3.4 for details)

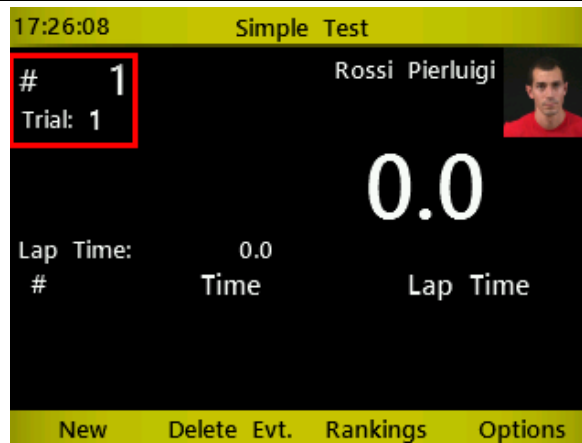


3 QUICK SETUP: HOW TO QUICKLY CARRY OUT YOUR FIRST TEST

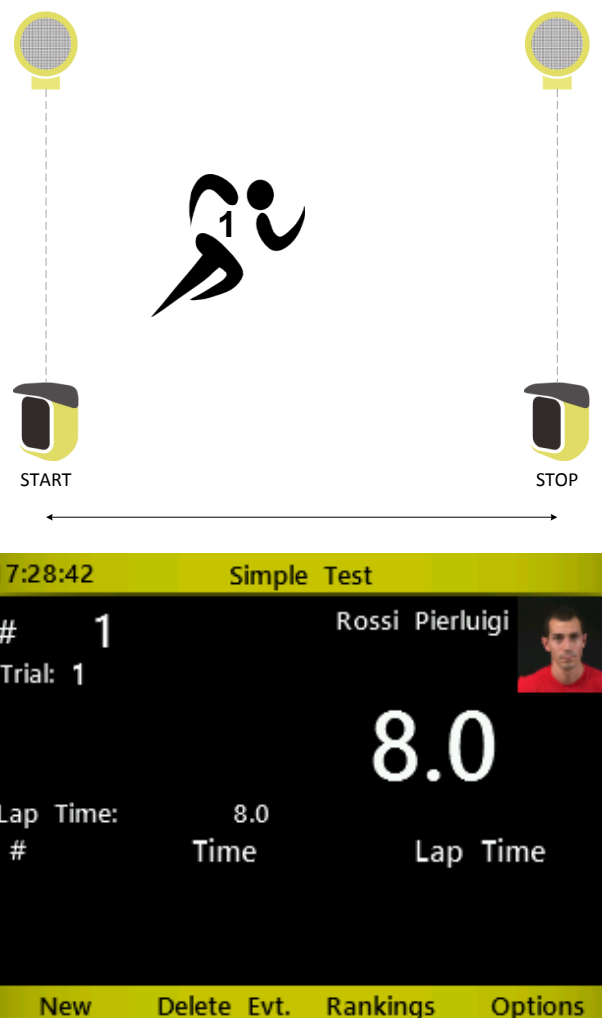
In a few steps we will show you how to carry out your first test:

Switch the Witty Timer on (chap. 2.1.1).	
Mount the photocells onto the tripods and turn them on (chap. 2.2.1); position the start and finish photocells at a certain distance.	
From the main menu select Test and then Test Base.	17:23:25 Main Menu  17:25:04 New Test 

In the top left corner the athlete's number as well as the athlete's trial number are displayed.

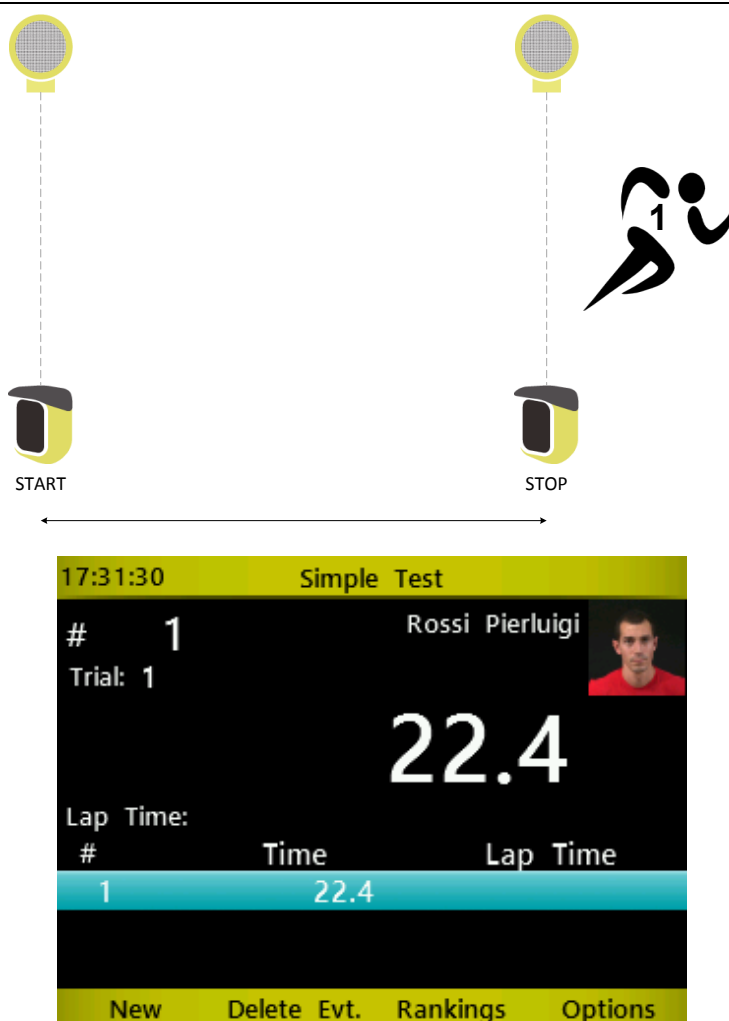


The athlete starts and as soon as he crosses the first photocell timing begins.

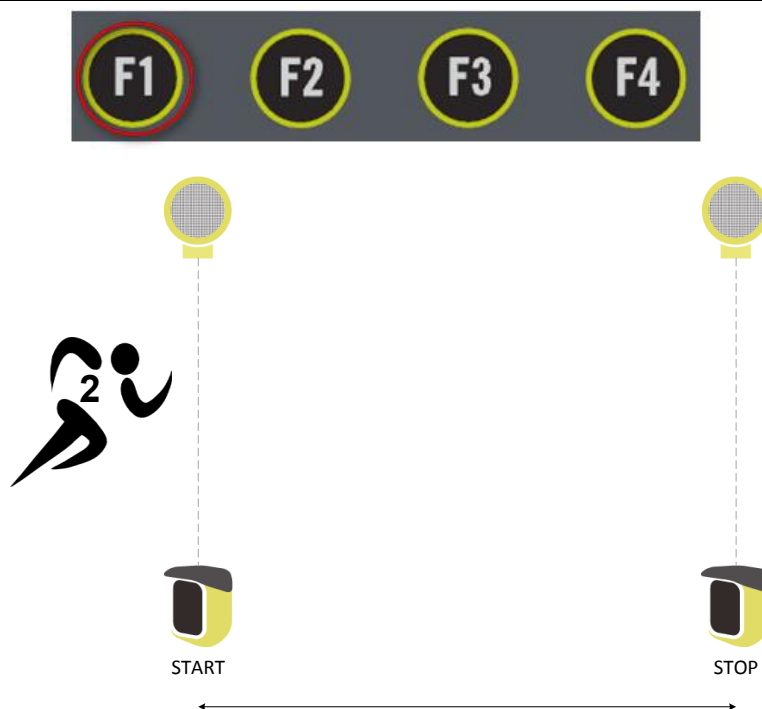


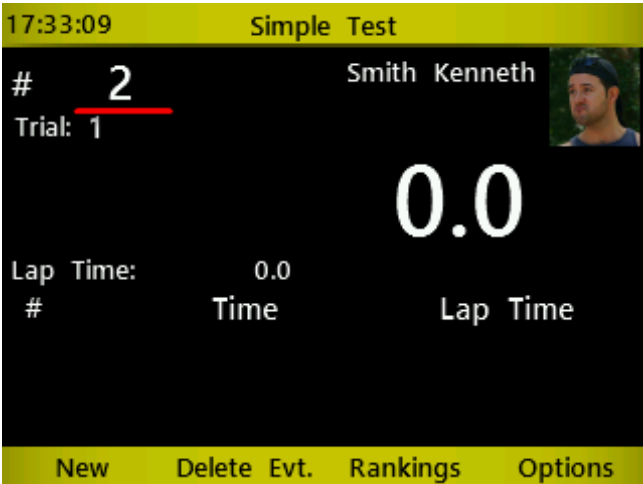
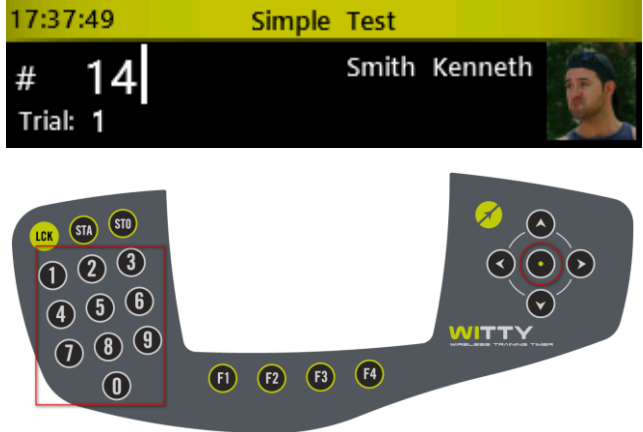
When the athlete interrupts the finish photocell, timing is stopped and a line is generated in the table at the bottom of the screen.

After 3 seconds timing continues, because as default all photocells are set as start photocells and do not receive a stop impulse, but this does not affect the performance of a test.



Press <F1> under 'NEW' for another athlete (in this case bib #2).



Press <F1> to confirm another athlete's start.	 
If the athlete has another bib number just enter the number using the numerical keypad and confirm by pressing <OK>.	
The <F3> Rankings button can be pressed at any time to show the temporary ranking of the test.	

Pressing the <i><Microgate></i> key (which can always be used for Back/Esc) or <i><F4></i> takes you back to the timing screen.	17:41:28Results Trial 1 <table><tr><th>Rk</th><th>Num</th><th>Time</th><th>Name</th></tr><tr><td>1</td><td>8</td><td>3.4</td><td>Adler Peter</td></tr><tr><td>2</td><td>14</td><td>4.1</td><td>Ford Ron</td></tr><tr><td>3</td><td>9</td><td>6.1</td><td>Colombo Ennio</td></tr><tr><td>4</td><td>1</td><td>22.4</td><td>Rossi Pierluigi</td></tr></table>	Rk	Num	Time	Name	1	8	3.4	Adler Peter	2	14	4.1	Ford Ron	3	9	6.1	Colombo Ennio	4	1	22.4	Rossi Pierluigi
Rk	Num	Time	Name																		
1	8	3.4	Adler Peter																		
2	14	4.1	Ford Ron																		
3	9	6.1	Colombo Ennio																		
4	1	22.4	Rossi Pierluigi																		
When all athletes have finished their test, press the <i><Microgate></i> key to exit the Test menu (confirmation required)	 17:42:38  Quit from race Are You Sure ? YesNo																				
Press the <i><Microgate></i> key again to return to the main menu. It is possible to review the test (ranking), continue or delete it from the Result menu (see chap. 5.2)	17:43:29Main Menu  Test  Result  Athletes  Settings																				

When the test session has been completed, switch off the timer (chap. 2.1.2) and the photocells (chap. 2.2.1)	
---	--

4 TEST TYPES:

Witty can handle various test types (sprint, shuttle, go & back, athlete groups, repetitions, etc.), which are described below.

Tests are divided into the following main types:

Icon	Name	Description
	BASIC	Tests for in-line timing of single athletes (one after the other) in laps or circuits (sprint, shuttle, go & back, endurance, etc.).
	MULTISTART	Test for timing several athletes (max. 3) simultaneously.
	COUNTER	Test for timing or counting repeated actions.
	WITTY-SEM	Test for agility and change direction performed with Witty-SEM

The various options available for each main type are explained below.

4.1 BASIC

The basic tests are divided into different sub-types:

Test Type	Basic
Mode	(None)
	(None)
	In Line
	Go & Back
	Shuttle with recovery

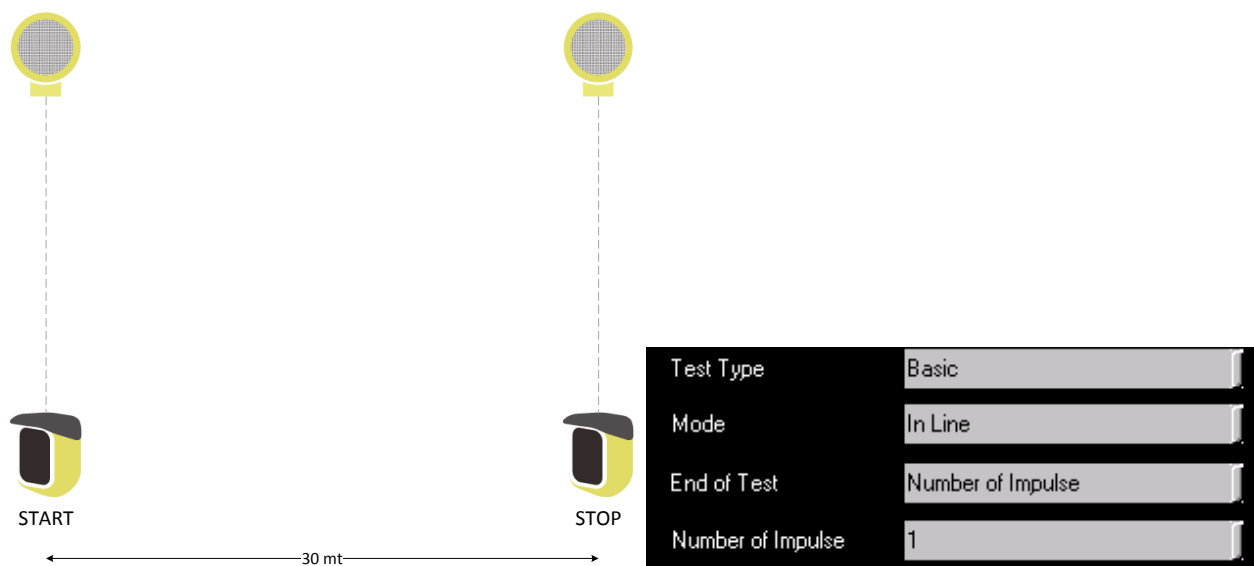
For every type it is necessary to define when and how the test is completed (**End of Test parameter**). Possible options are:

Number of Impulses:	Choosing a finite number of impulses (e.g. 5) the test will be completed when the timer receives a number of events equal to the set parameter <u>except for the first Start event</u> . Leaving the parameter on '0' (undefined), the test never ends and the operator will decide when another athlete begins the test.
End of Time	Setting a time in minutes:seconds, the test will finish when the set amount of time is reached.
No. of Impulses or End of Time	Setting both parameters, the test ends when the first of the two conditions is reached.

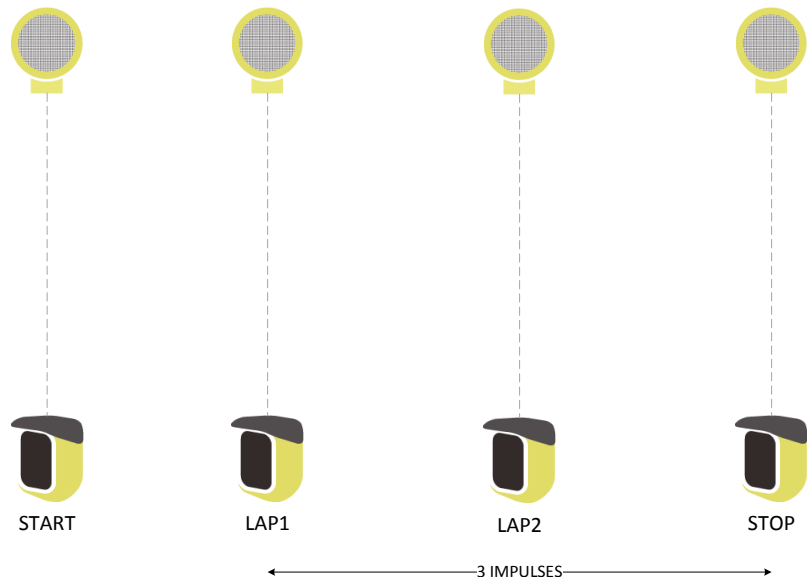
4.1.1 IN LINE

Basic / In Line tests are the simplest kind of tests and allow, for example, sprint timing over a certain distance.

Example 1a. To time a sprint test over 30 meters with Start and Stop it is enough to set the End of Test with 'Number of Impulses' equal to 1 (please note that the Start Impulse must never be counted).



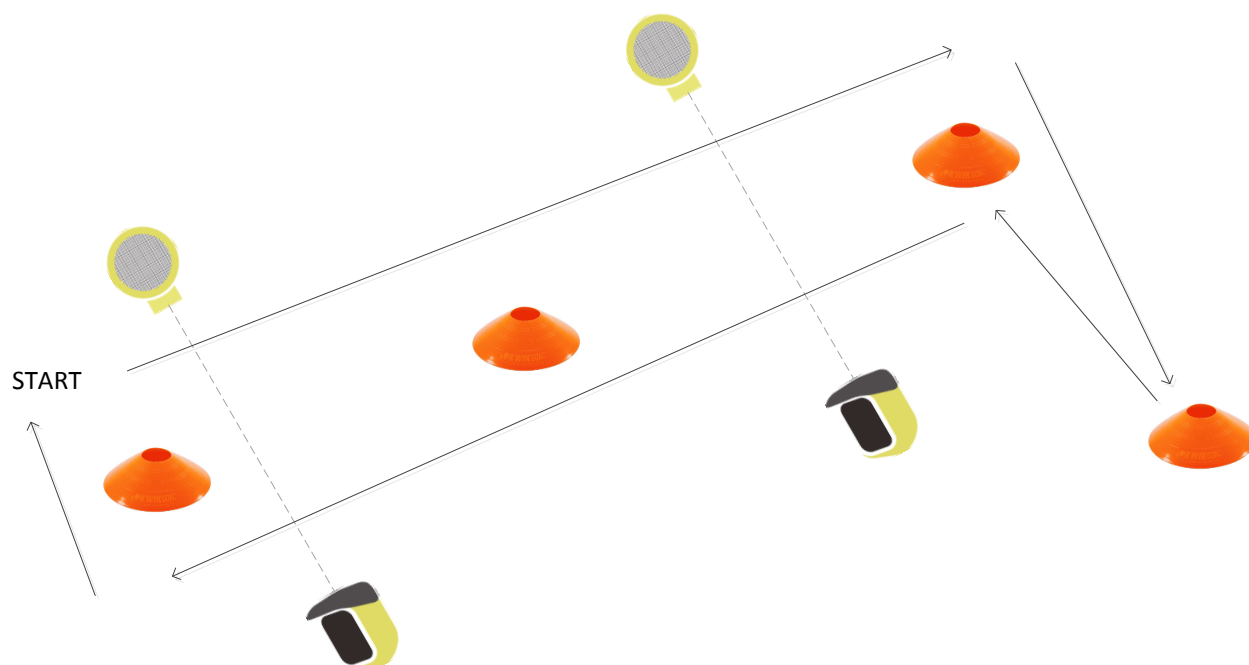
Example 1b. If you want to add one or more lap times, just increase the value of Number of Impulses.



Test Type	Basic
Mode	In Line
End of Test	Number of Impulse
Number of Impulse	3

The End of Test parameter set to 'End of Time' is useful for test types where a given number of actions must be carried out in a certain amount of time. These actions can be counted via the number of impulses received from the photocell.

Example 2: Checking how often photocells are passed within 30" of this course:



The test will finished as follows:

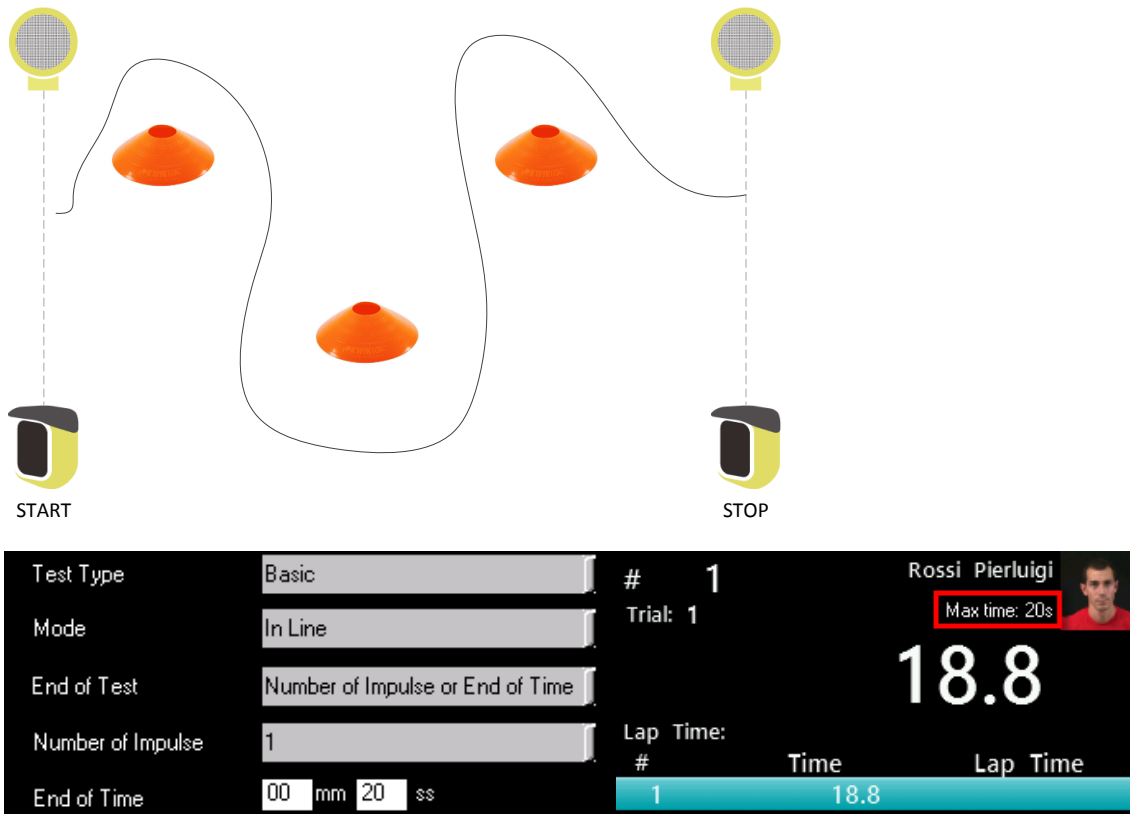
Test Type	Basic
Mode	In Line
End of Test	End of Time
End of Time	00 mm 30 ss

The ranking shows information by position (Pos), number of impulses (#), bib (Num), time, and possibly the athlete's name. The winner is the one with the highest number of impulses or, in case of tie, the one who was the fastest.

17:56:50 Results				
Trial 1			Max time: 30s	
Rk	#	Num	Time	Name
1	6	14	20.2	Ford Ron
2	6	1	20.3	Rossi Pierluig
3	5	8	18.4	Adler Peter
4	5	9	21.2	Colombo Enr
View Sort Trial Cancel				

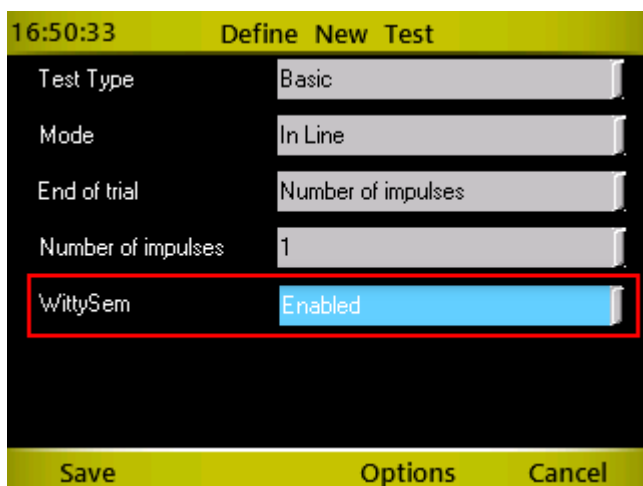
Bib 14 and 1 made six passages, whereas number 8 and 9 only five; the ones with the same amount of passages are ranked by time.

Example 3. If in a test an athlete must complete a circuit within 20" and there is only one start and stop, the end of test can be set as '**Number of Impulses or End of Time**'; if the athlete manages to perform the test, his time will be saved, otherwise the timer is stopped.



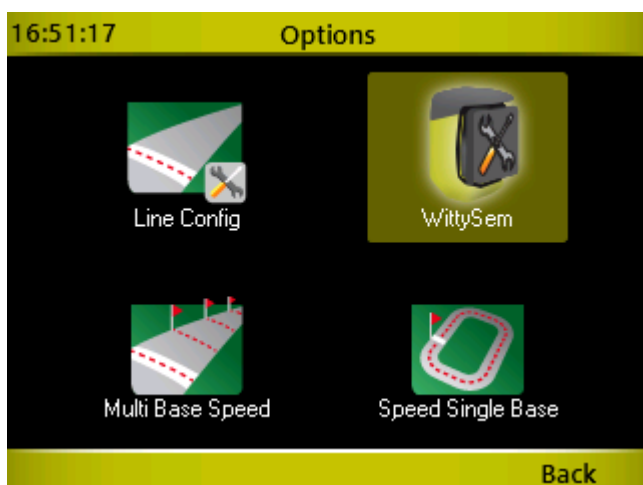
4.1.1.1 ENABLING WITTY-SEM AS THE STARTING TRAFFIC LIGHT

The last parameter that is found in every type of test is the possibility to use the Witty-SEM as a starting traffic light with a predefined countdown that shows athletes when they can start.

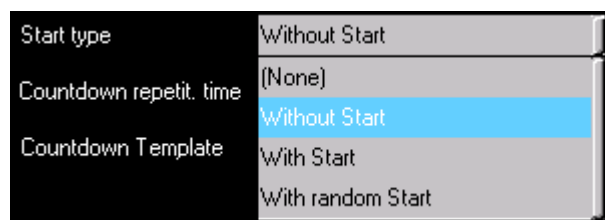


16:50:33 Define New Test	
Test Type	Basic
Mode	In Line
End of trial	Number of impulses
Number of impulses	1
WittySem	Enabled
Save Options Cancel	

Once this selection has been enabled, press <F3> Options and then select the Witty-SEM Options icon



16:51:17 Options	
Line Config	WittySem
Multi Base Speed	Speed Single Base
Back	



Start type	Without Start
Countdown repetit. time	(None)
Countdown Template	Without Start
	With Start
	With random Start

The next screen is used to select the following parameters:

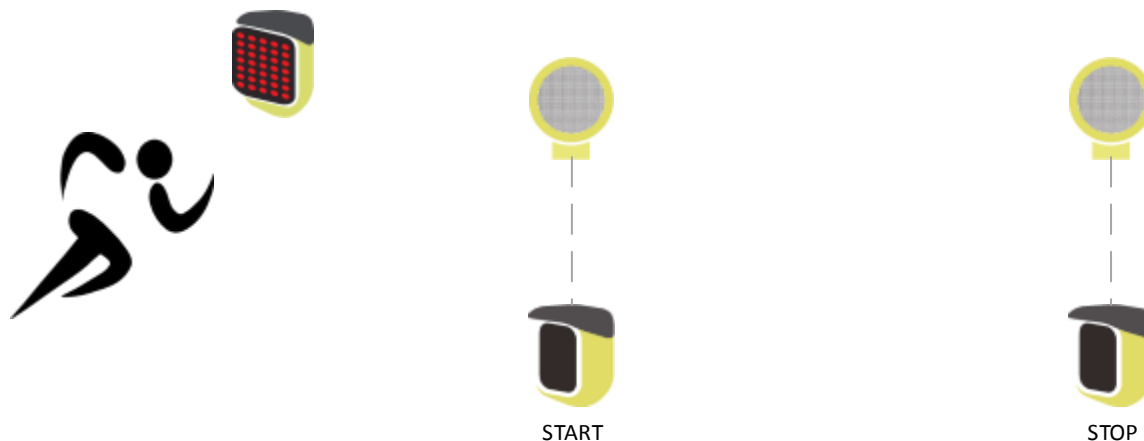
“Type of start” it can be defined as:

- Without start** Witty-SEM displays every "n" minutes:seconds (defined with the “Countdown repetition timer” parameter) the sequence of the selected countdown.
- With start** Like above, but a radio START impulse is generated at the end of the countdown and the timer starts to time the current athlete.
- With random start** Like above, but the start impulse is not generated immediately after the countdown, but after a random period of time that does not exceed the “Random time” parameter

The second parameter **“Countdown repetition time”** (mm:ss) indicates how often the cycle is repeated, whereas **“Countdown Template”** makes it possible to select one of the 3 predefined types of countdowns (3, 5, 10 seconds). In the case of “Start type” or “With random start” it is possible to indicate within what period of time the start is generated (**“Random time”**)

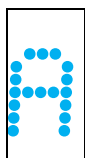
Here are a few examples:

Example 1: Start every 45 seconds, with a 5 second countdown, without start generation (as it is taken by the first photocell)



16:57:04 WittySem	
Start type	Without Start
Countdown repetit. time	00 mm 45 ss
Countdown Template	Countdown 5s

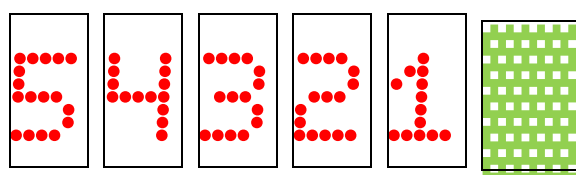
The traffic light is in stand-by with its index displayed in blue



The first traffic light start takes place manually by pressing the button <F1> Start Traffic Light

#	1	Redmond Devonte
Trial:	1	Impulses: 1
		0.00
Lap Time:	0.00	
Time		Lap Time
Start Sem Delete Evt. Rankings Options		

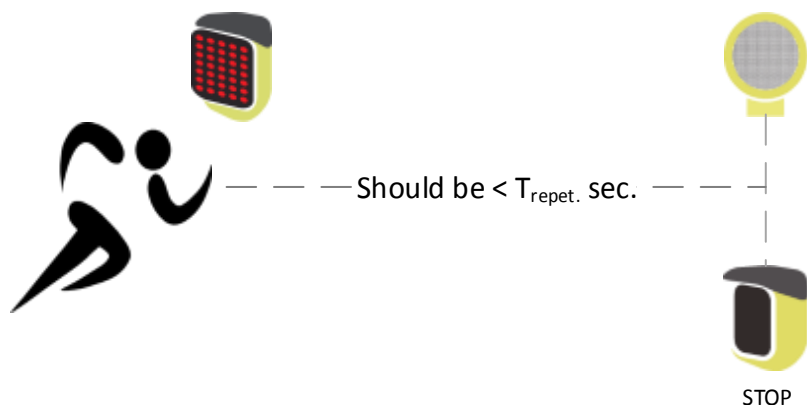
Witty-SEM carries out the selected countdown (5 sec.) and then immediately displays the green signal for 5 seconds.



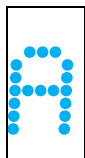
...wait 35 seconds (45 – 5 for the countdown – 5 for the

green) and restart

Example 2: Start every 30 seconds, with a 3 second countdown and generation of the start impulse (the start photocells is not required)



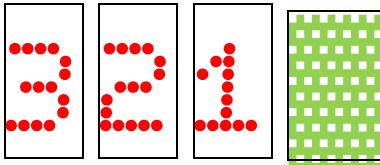
The traffic light is in stand-by with its index displayed in blue



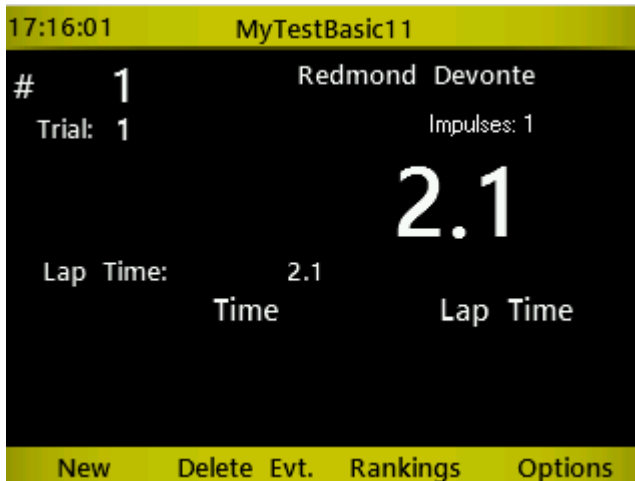
The first traffic light start takes place manually by pressing the button <F1> Start Traffic Light



Witty-SEM carries out the selected countdown (5 sec.) and then immediately displays the green signal for 5 seconds.



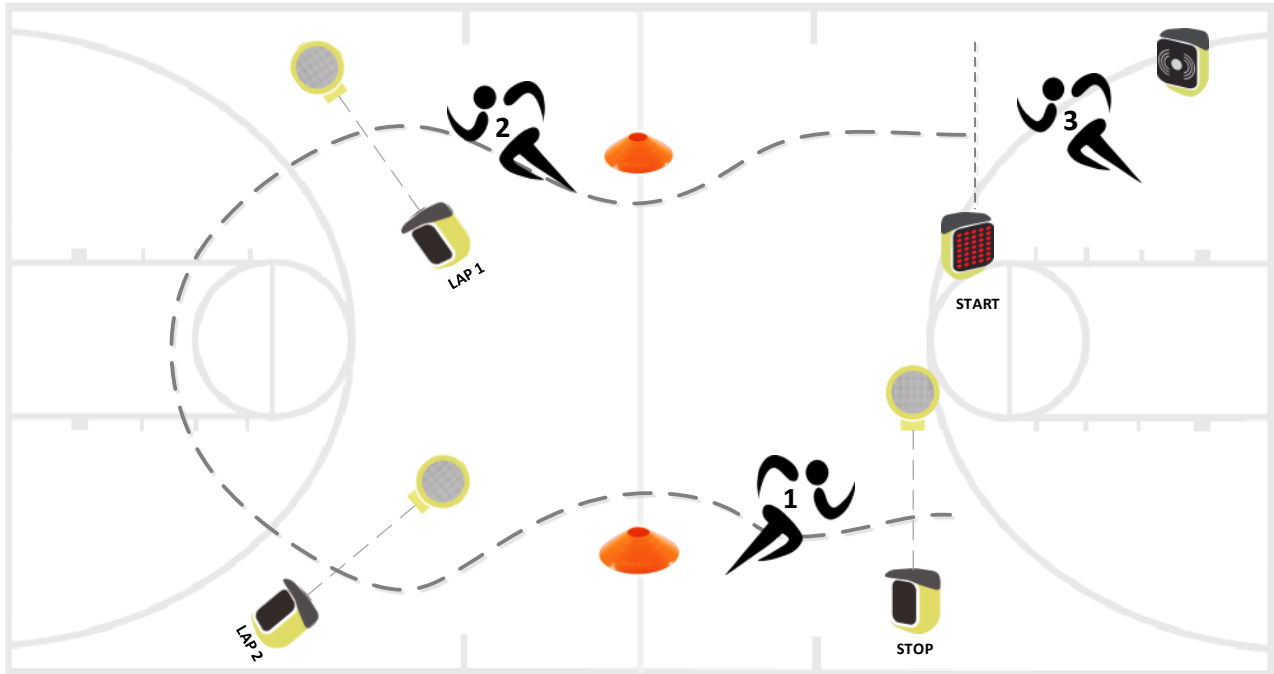
As soon as green appears, Witty-SEM launches a start impulse via radio and starts the timer



...afterwards, it waits 22 seconds (30 – 3 for the countdown – 5 for green) and restarts the cycle.

ATTENTION: If within the 30 seconds defined in the countdown repetition time the current athlete has not yet arrived, the next automatic START provided by Witty-SEM will be interpreted as the STOP of the previous athlete. Therefore, repeat a repetition time that is greater than the test time (with a certain safety margin).

Example 3: Start every minute, with a 10 second countdown, with generation of a random start from 0 to 7 seconds after the end of the countdown. In this case, the type of test is MultiStart (see chap4.2) and the athletes go to the start after scanning their bracelet with Witty-RFID (see chap 2.6)



Start type	With random Start
Countdown repetit. time	01 mm 00 ss
Random time	00 mm 07 ss
Countdown Template	Countdown 10s

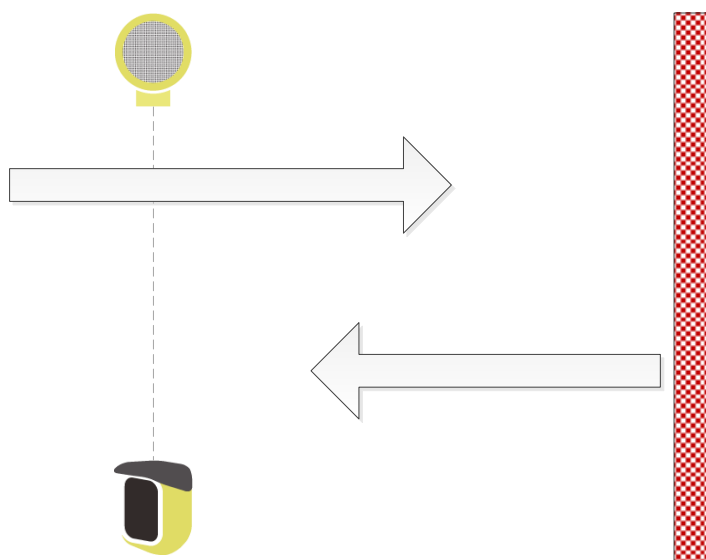
4.1.2 Go & BACK

The Go & Back test type is basically similar to the In-Line test, but is designed for a specific test type with only one photocell.

For example: place the photocell (which will be used as Start and Stop) at a certain distance from the wall and define the test as follows:

Test Type	Basic
Mode	Go & Back
End of Test	Number of Impulse
Number of Impulse	1

The athlete starts, crosses the photocell (which starts timing), touches the wall and crosses the same photocell again, which stops the time.



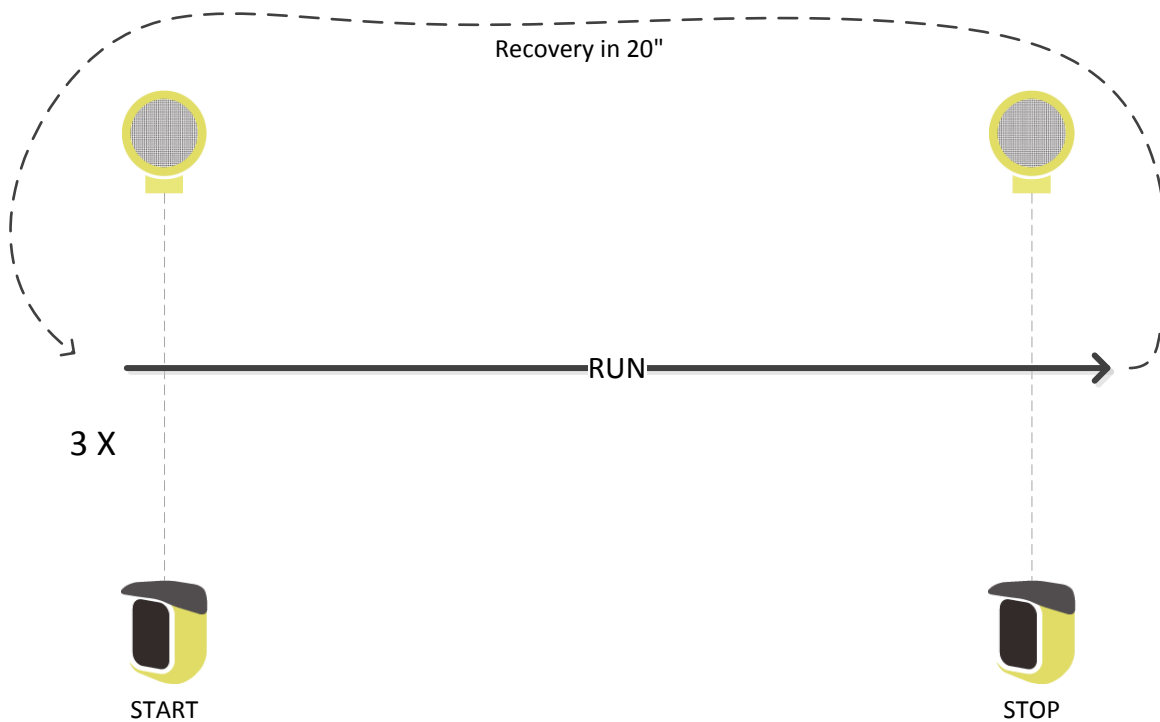
#	1	Rossi Pierluigi	Impulses: 1
Trial:	1		
			3.6
Lap Time:			
#	Time	Lap Time	
1	3.6		

Of course it is possible to complete various 'laps' simply by increasing the number of impulses. Similarly to the previous chapter several go&back exercises can be created with a maximum time or by matching maximum time / number of impulses.

4.1.3 SHUTTLE WITH RECOVERY

The Shuttle test (with or without recovery) allows to execute shuttle tests, where an exercise is carried out a certain amount of times with a given number of seconds for recovery between them.

e.g. **50-meter sprint to be performed 3 times with 20" recovery between one sprint and the other.**



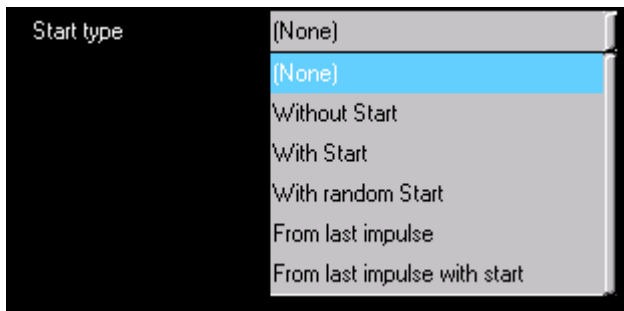
The test is set as follows:

Test Type	Basic
Mode	Shuttle with recovery
Number of Impulse	1
Number of Repetition	3
Pause Time	00 mm 20 ss

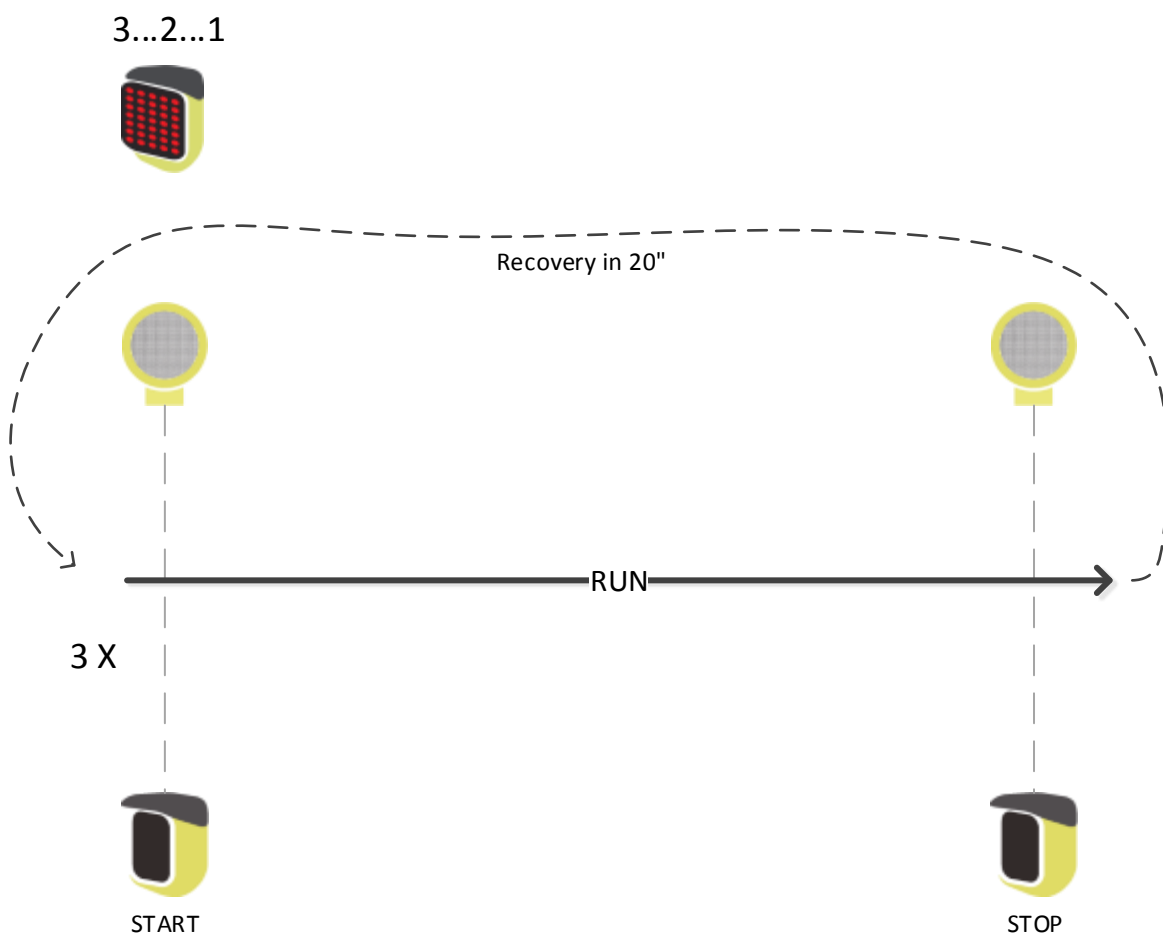
See chap. 5.1.2.4 for a timing example.

4.1.3.1 ENABLING WITTY-SEM

If Witty-SEM is enabled to be used as a start traffic light, there will be two additional options for Type of start

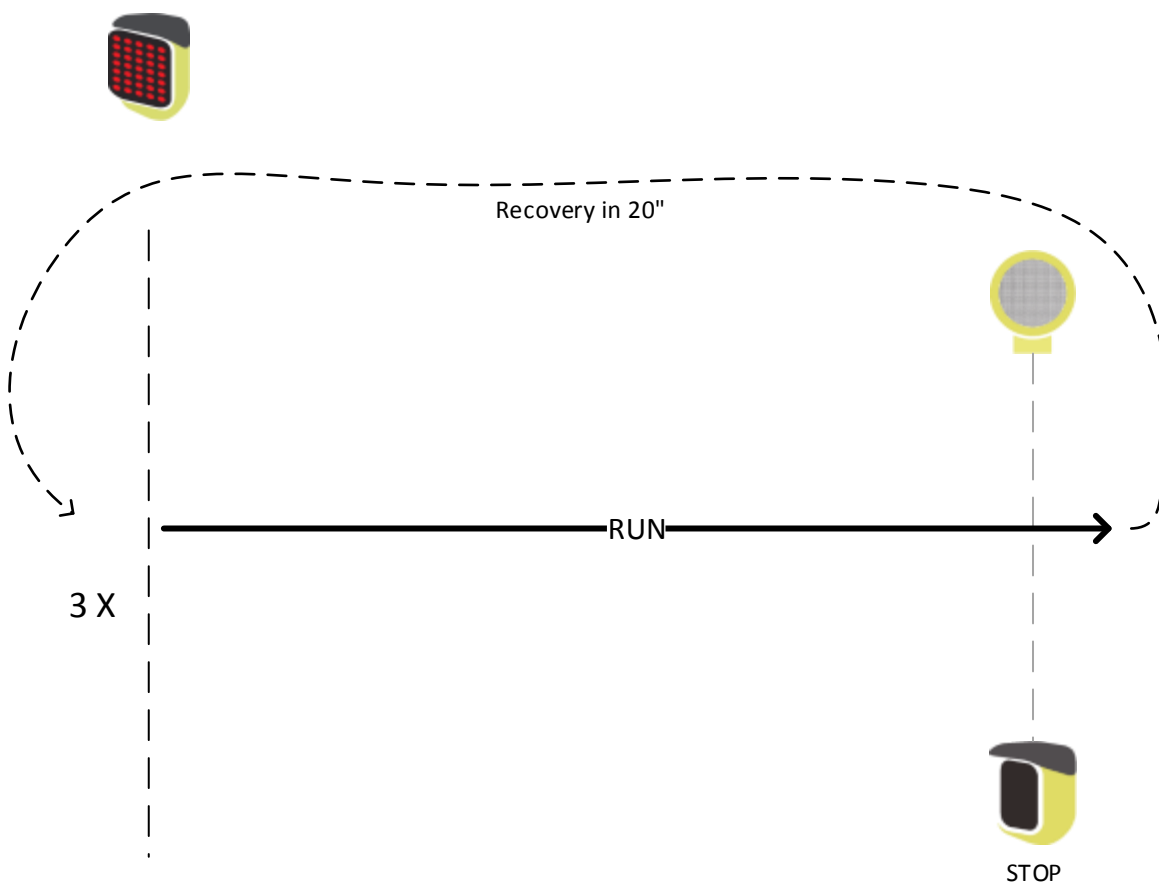


“From the last impulse”, start the selected countdown (3s,5s,10s) after the athlete triggered the last impulse of each individual repetition (the stop photocell in the figure). Always remember to press <F1> Start Sem light at the beginning of the test.



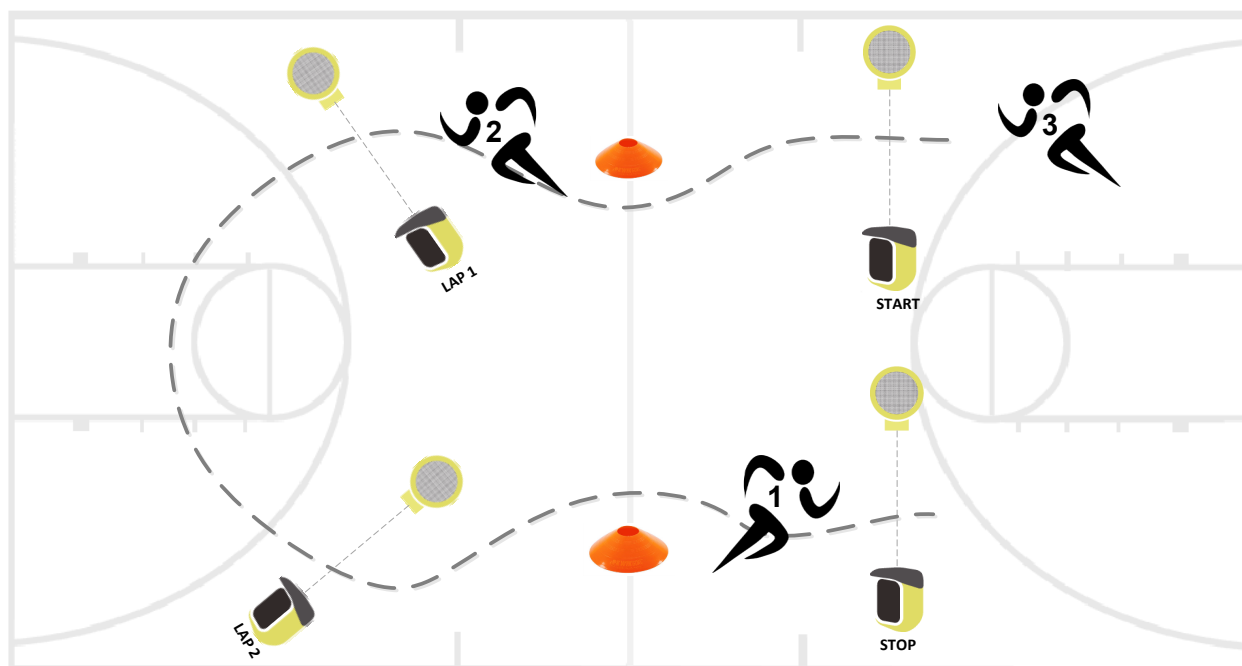
“From the last impulse with start”, when pressing Start traffic light and after the selected countdown (3s,5s,10s), a start impulse is transmitted to the timer. This is useful when only one photocell is available that is used for the stop

3...2...1...START



4.2 MULTISTART

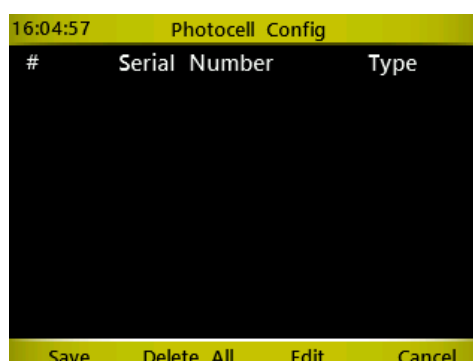
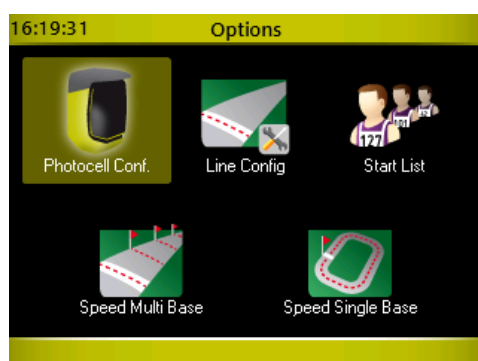
The MultiStart test allows to time circuits or courses carried out by several athletes at the same time (max. 3) from the start line to the finish line. The athletes must NOT start simultaneously (otherwise it would be impossible to associate events to bibs) but must start one after the other and in sequence. Even though, as we will see, it is possible to manage cases where one athlete passes another athlete, we suggest that you distance the athlete starts in order to prevent this. If a certain sequence of events connected to impulses is maintained (athlete 1 start-lap, athlete2 start-lap, etc.), it is much easier to manage the test.



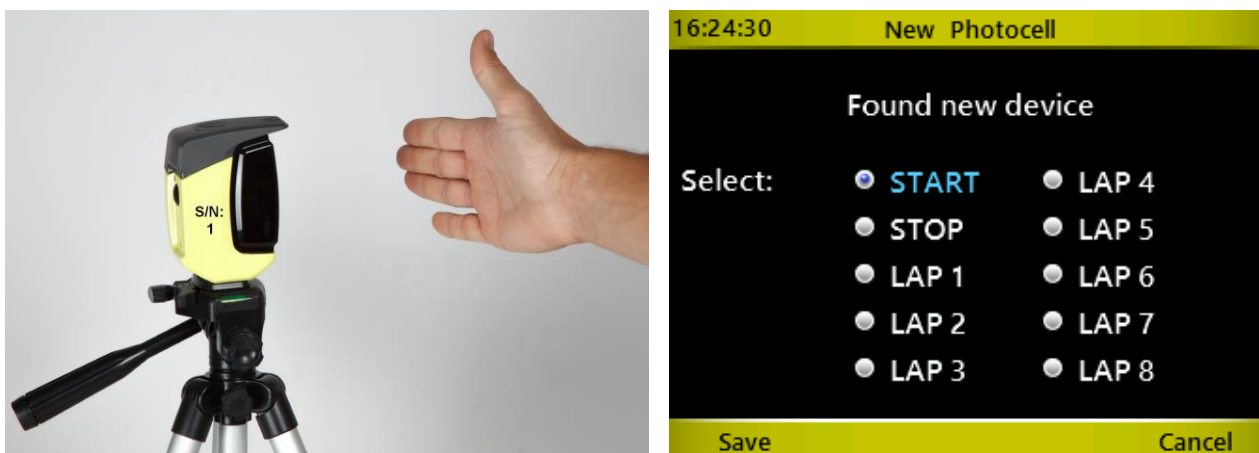
4.2.1 CONFIGURING THE PHOTOCELLS

While for other test types (Basic and Counter) the photocells are set in the same way (start), in MultiStart tests they must be identified and assigned (i.e. set which photocells are start, which are stop and which are lap-n). This assignment can be carried out when defining the test (it is advisable to mark the photocells with a piece of tape or a label for the following test sessions) or directly from the timing screen using the Options key.

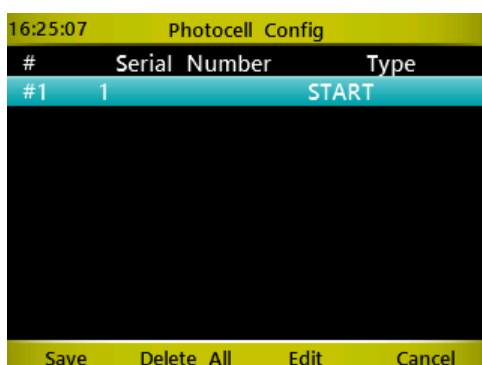
Create a MultiStart test as described in chap. 5.1.4. From test configuration, click on Options > Photocell Config, where an empty list is displayed:



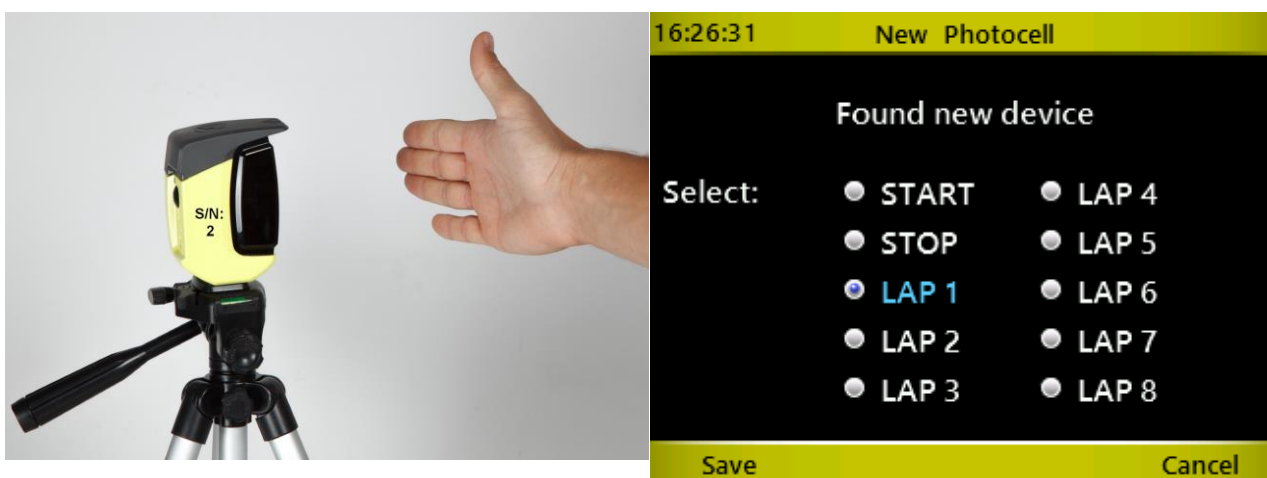
Assignment is very easy and consists of interrupting the photocell (having a unique serial number) with one hand and defining the required event type:

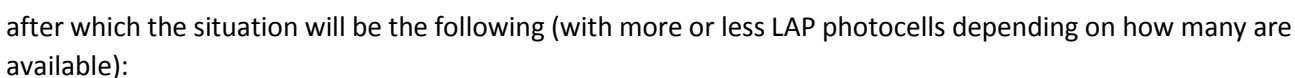


Scroll with the <up> and <down> arrow keys and select the event by pressing <OK>, then select <F1> to save. In the following example the photocell with the serial number 1 is associated to the START event.



Repeat the operation with the other available photocells (at least the stop photocell):





Press <F1> to save the configuration! (By pressing <F4> or <Microgate> the previous screen is closed without saving, thus all entered data will be lost).

To change the event type associated to a photocell, go to the line (light blue color) of the required photocell and press <F3>. Similarly to the first photocell, choose the event type and save by pressing <F1>.

It is not possible to delete a single assignment, but only to reset the configuration (<F2> key) to begin a new assignment.

By closing the Test configuration screen it is possible to set a Max Time for completing the circuit/course. The field can be left undefined or you can set a value in minutes:seconds.

Test Type	Multistart
Max Time	(Undefined)
	(Undefined)
	(Insert...)

Test Type	Multistart
Max Time	00 mm 45 ss

4.3 COUNTER

The Counter test type counts a given number of actions/exercises or checks how long it takes to complete an exercise consisting of a certain number of repetitions.

The End of Test parameter can be defined as follows:

Number of Impulses: Choosing a number of impulses (e.g. 5) the test will be completed when the timer receives a number of events equal to the entered value, including the first Start event (not like in the Basic test type, where it is excluded).

End of Time Setting a time in minutes:seconds, the complete test will finish when the set amount of time is reached.

Timeout Setting a time in minutes:seconds, the test ends when the 'repetitions' are carried out in an amount of time that is higher than the one set.

It is furthermore possible to indicate if the **First Impulse** is to be included in the timing or not.

Let's see some examples:

Example 1. Timing of how much time it takes to do 10 push-ups.



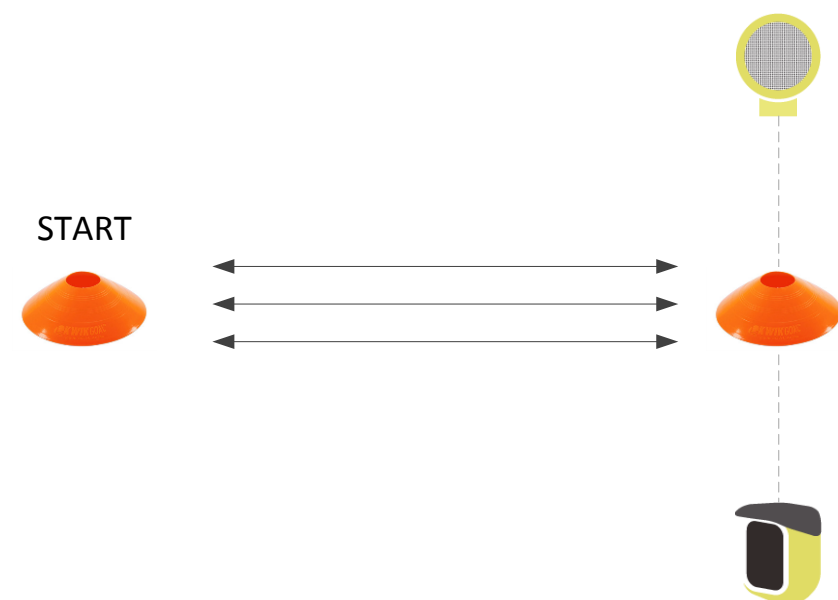
Set the test with End of Test=Number of Impulses and as parameter the desired number of push-ups:

Test Type	Counter
First impulse	Yes
End of trial	Number of impulses
Number of impulses	10

While timing, the main parameter showing is the counter. In the table, for each repetition the progressive time and the amount of time of the single repetition is displayed.

17:07:58		10Counter	
#	1	Rossi Pierluigi	
Trial: 1		Impulses: 10	
			
		8	
Time	9.2		
#	Time	Lap Time	
8	6.1	1.9	
7	4.2	1.2	
6	3.0	0.5	
New		Delete	Evt. Rankings Options

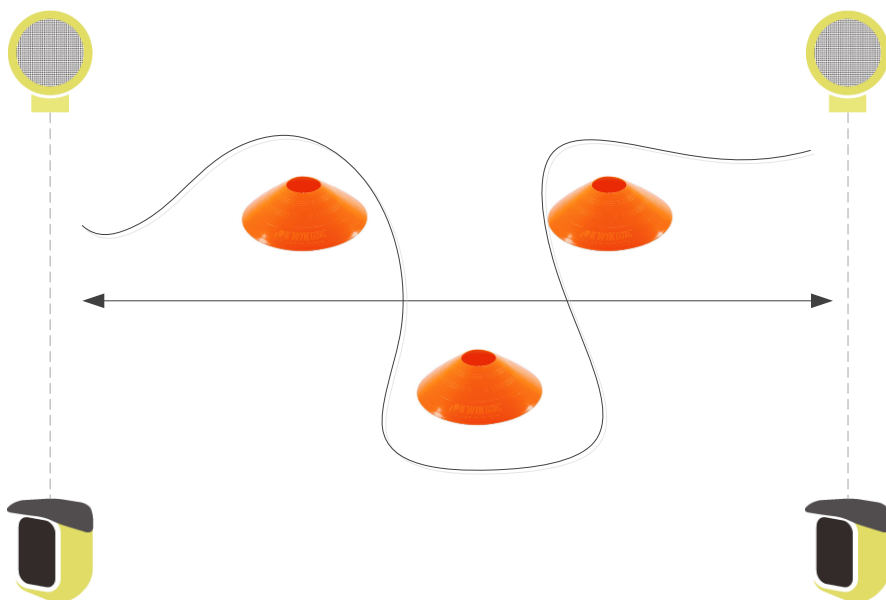
Example 2. Test for one minute and check how many times the action is performed during the total amount of time (e.g. go and back from two positions crossing a photocell). The winner is the one who has totaled more impulses within the maximum time (and in case of same number of impulses, within the shortest amount of time). The first start impulse (starting from far away) is not counted.



Test Type	Counter
First impulse	No
End of trial	End of time
End of time	1 mm 00 ss

17:11:26		ScattoFreno1min	
#	1	Rossi Pierluigi	
Trial: 1		Max time: 60s	
			
4			
Time	36.4		
#	Time	Lap Time	
4	17.5	4.5	
3	13.0	4.6	
2	8.4	8.4	
New	Delete	Evt.	Rankings Options

Example 3. A certain repetitive action must be carried out within 30 seconds (e.g. slalom through cones or a series of jumps). If the repetition takes longer than the set time, the test is stopped. The winner is the athlete performing the highest number of repetitions.



Test Type	Counter
First impulse	Yes
End of trial	Timeout
Timeout	00 mm 30 ss

4.4 WITTY·SEM

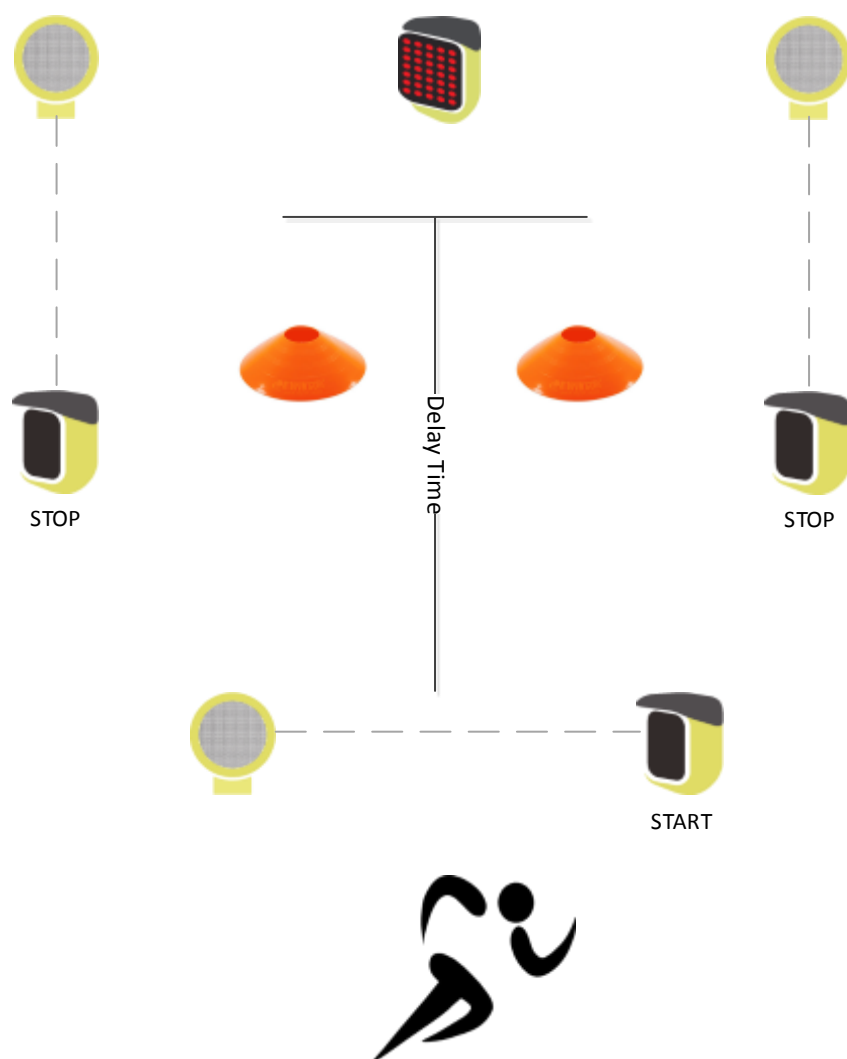
There are two categories of "Witty·SEM" tests:

Test Type	WittySem
Mode	(None)
	(None)
	Change Direction
	Agility

4.4.1 CHANGE DIRECTION

The Witty·SEM/Change Direction type of tests are used to perform exercises in which the traffic light has the athlete change direction randomly (right, left, forwards, backwards) using the arrow symbols.

Example 1: this could be a variant of the classic T-test, where the athlete starts off, crosses a Start photocell, runs a few metres and the traffic light indicates (randomly) to sprint to the right or to the left;



To carry out this type of exercise, set the test as follows

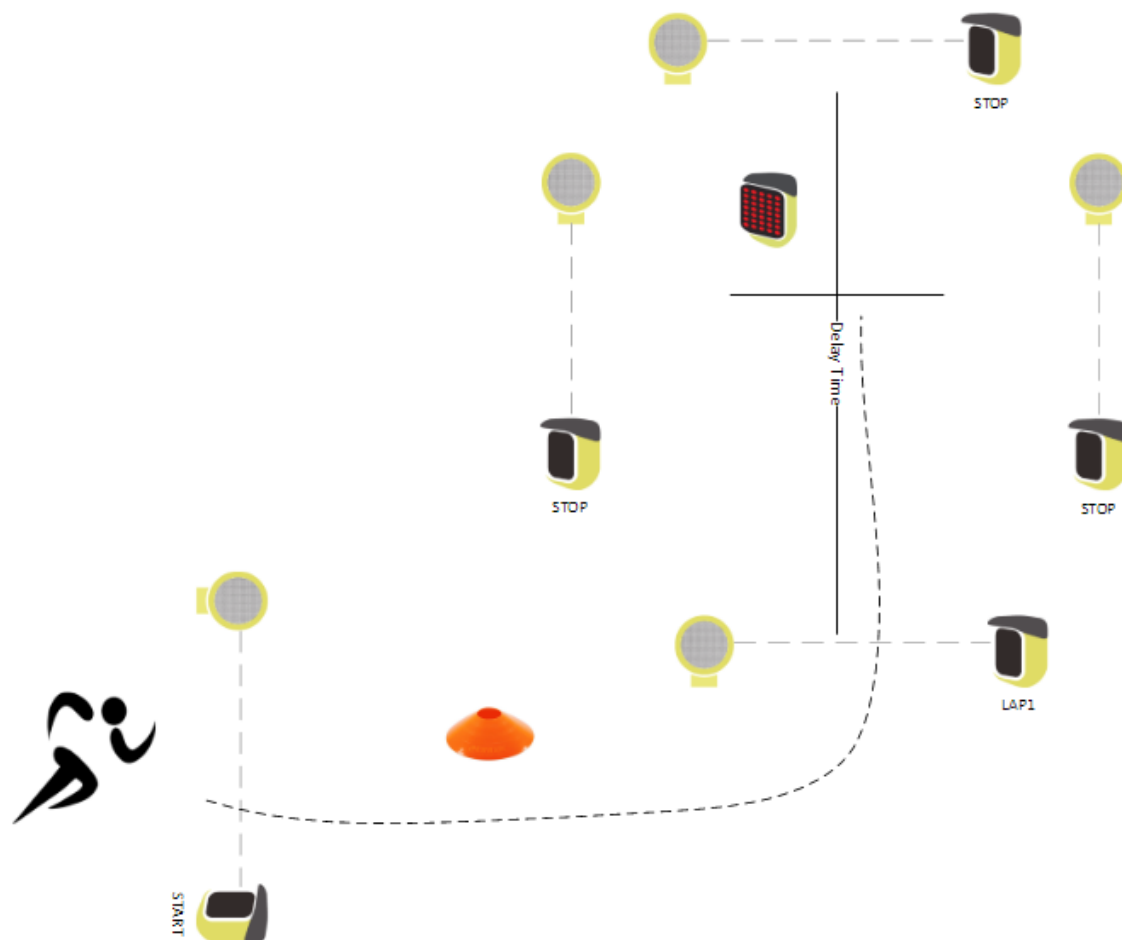
Test Type	WittySem
Mode	Change Direction
Delay	05 1/10 sec
Number of impulses	1
Direction	Left/Right

- Delay:** Insert the delay in tenths of a second, after which Witty·SEM turns on the direction change arrow. The parameter is set, calculating approx. the time the athlete takes from the last impulse before the traffic light to the direction change point.
- Number of impulses** Number of impulses after which Witty·SEM displays the arrow. In example 1 it is set to 1 (start photocell before the traffic light); in example 2 below, it is set to 2 (start + lap1).
- Direction** This indicates the directions Witty·SEM displays; the possible selections are left/right, left/right/forwards, left/right/forwards/backwards

The sequence takes place as follows:

Witty·SEM off– start impulse – half a second wait (5 tenths) – appearance of the right or left arrow – stop impulse – Witty·SEM indicates its index (A,B,C). Pressing <F1> New, the sequence restarts.

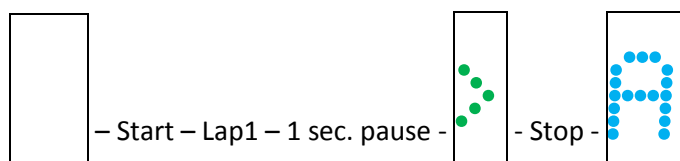
Example 2: The athlete starts, triggers the start photocell, does a lap, after n tenths of a delay, Witty-SEM indicates to the athlete to go to the right, left or straight. The stop photocells stop the time.



The test is defined as follows:

Test Type	WittySem
Mode	Change Direction
Delay	10 1/10 sec
Number of impulses	2
Direction	Left/Right/Forward

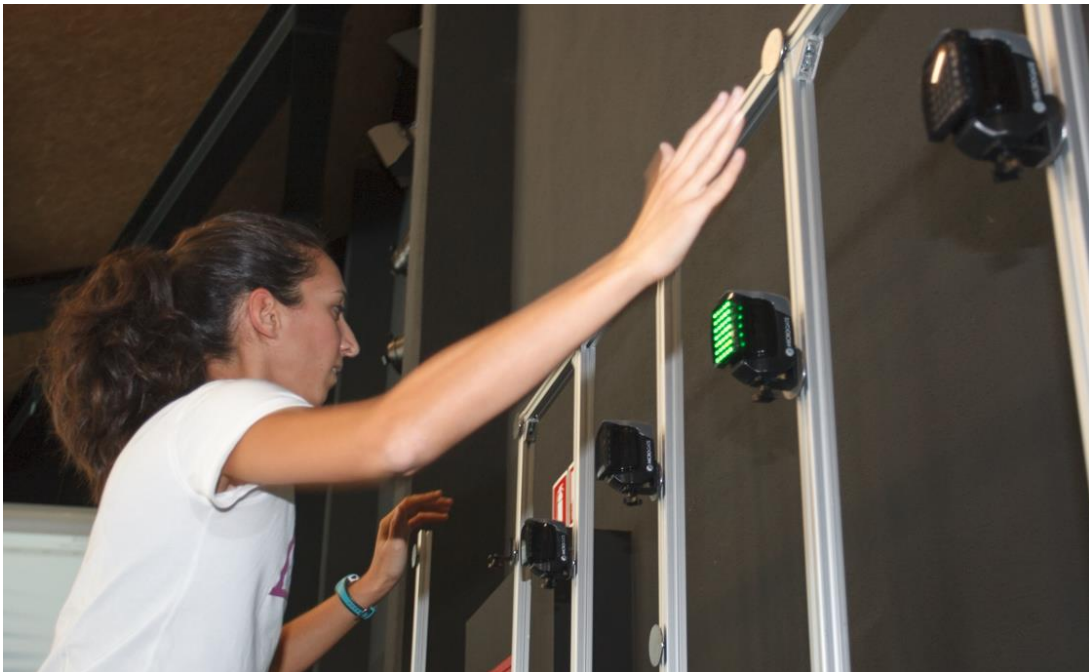
The sequence will be:



4.4.2 AGILITY

With this type of test, the Witty + Witty-SEM system becomes a tool to have the athlete perform speed & agility exercises, where the objective is to “turn off” the traffic light by approaching the proximity sensor with a hand (or foot, a racquet or other body parts).

It is obvious that multiple Witty-SEM traffic lights must be used that, after receiving the test parameters, will turn on/off according to a sequence pre-set by the user or randomly depending on the mode. The traffic lights can be positioned differently (on tripods, on magnetic supports, on suction cups on the ground, etc.) depending on the selected exercise.



If you do not want the athlete to come near the traffic light but rather trigger the passage through a “gate”, it is possible to combine a photocells with a traffic light using a C-bracket and connecting them to a cable (the same way as with a double photocell, see chap. 2.2.3).

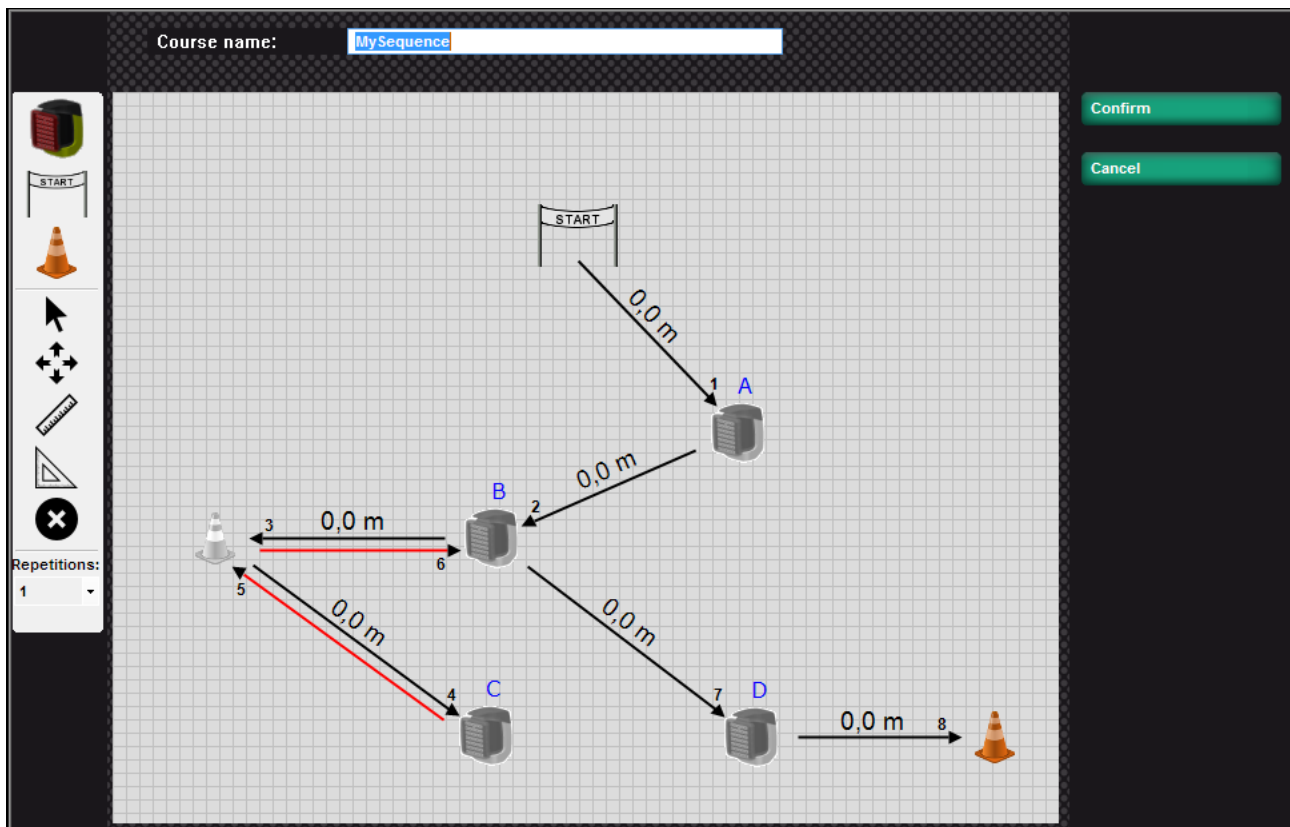


The Agility tests can have a different type of sequence as indicated below:

Test Type	WittySem
Mode	Agility
Sequence	(None)
	(None)
	Custom
	Random
	Random Multicolor
	Random Multisymbol
	Random Multisymbol and Multicolor

4.4.2.1 CUSTOM

The Sequence (route) to follow is designed using the Witty Manager software and given a name as preferred (MySequence in the example). The same name is selected in the Sequence Template field.



Refer to the software manual for details about how to design the sequence.

17:30:08 Define New Test

Test Type	WittySem
Mode	Agility
Sequence	Custom
Sequence Template	MySequence
Delay	10 1/10 sec
End of trial	Number of Impulses or End of time
Number of impulses	6 1 mm 30 ss

Save Options Cancel

The following fields are the same for all types of sequences:

Sequence template: Select one of the customised templates created with Witty Manager

Delay: Delay in tenths of a second between the turning off of a traffic light and the turning on of the next one

End of test This indicates the way the test ends, it can be

Number of Impulses: Choosing a finite number of impulses (e.g. 5) the test will be completed when the timer receives a number of events (traffic light "off" operations) equal to the set parameter. The parameter is calculated automatically in the case of customised sequences.

End of Time Setting a time in minutes:seconds, the test will finish when the set amount of time is reached.

No. of Impulses or End of Time Setting both parameters, the test ends when the first of the two conditions is reached.

Pressing the key <F3> Options and selecting the Witty-SEM icon makes it possible to select the colour, type of symbol and the symbol/character/number to follow. The default setting is always the green block (rectangle), but it is possible to have an athlete follow a letter (lower case or upper case) or a number with one of the three available colours

17:30:42

Catch the color	Green
Catch the symbol from	Number & chars
Catch the symbol	

Save Cancel

Catch the colour:	Select one of the 3 available colours; green, red, blue
Catch the symbol from:	Numbers and characters (0...9, a...e) Characters only (A...O)
Catch the symbol	The block, the letter or the number depending on the selected set

The test starts with a 3 second countdown and then turns on the first traffic light that the athlete must turn off.

As soon as it is turned off via the proximity sensor or by obscuring the connected photocell, it turns on the next one (with a possible set delay of n tenths of a second).

The timer detects the OFF condition via the intermediate times

17:32:54		MyAgility1	
#	1	Redmond Devonte	
Trial:	1	Impulses: 5	
		4.12	
Lap Time:	1.27		
	Time	Lap Time	
3	4.12	1.27	
2	2.85	1.53	
1	1.32	1.32	
New	Delete	Evt.	Rankings Options

If a route was created that also indicated the distances, also the speeds are displayed.

It is very important to adjust the proximity sensor threshold in accordance with how the test should be carried out; if the athlete must get very close to the traffic light (almost touching it) set the threshold to "close", otherwise "average" or "distant" should be sufficient (see chap. 5.4.8)

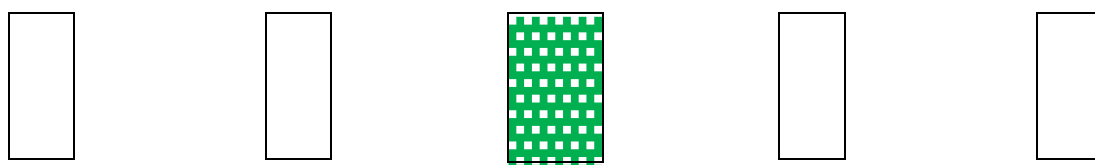
4.4.2.2 RANDOM

With this type of sequence, only one of the N traffic lights turns on with the selected symbol/colour, all the others remain off.

Test Type	WittySem
Mode	Agility
Sequence	Random
Number of WittySem	5
Delay	00 1/10 sec
End of trial	Number of impulses
Number of impulses	10

The only parameter that is different than the previous one is how many traffic lights that are used (in the customised sequences, it is automatically taken from the selected template)

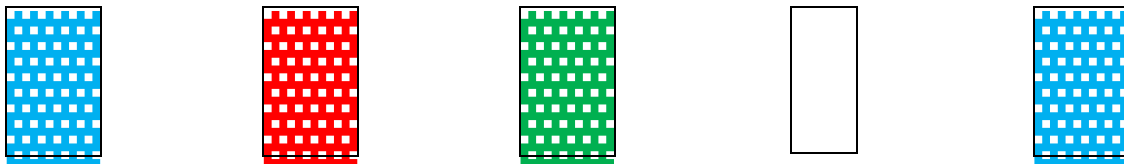
Number of Witty-SEM: Indicate how many Witty-SEM are available



Catch this !

4.4.2.3 RANDOM MULTICOLOUR

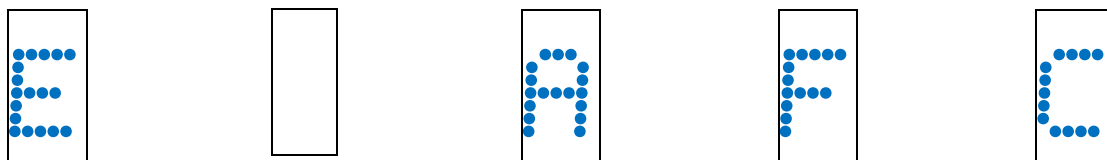
The colour to be followed is defined (e.g.  red); the other traffic lights display nothing, or the same symbol but in a different colour



Catch this !

4.4.2.4 RANDOM MULTISYMBOL

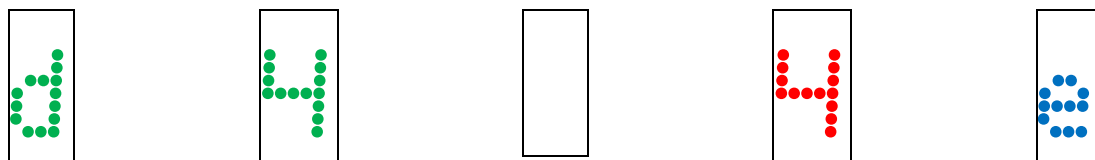
The symbol to be followed is defined (e.g.  blue); the other traffic lights display nothing, or other symbols in the same set, but always in the same colour



Catch this !

4.4.2.5 RANDOM MULTISYMBOL AND MULTICOLOUR

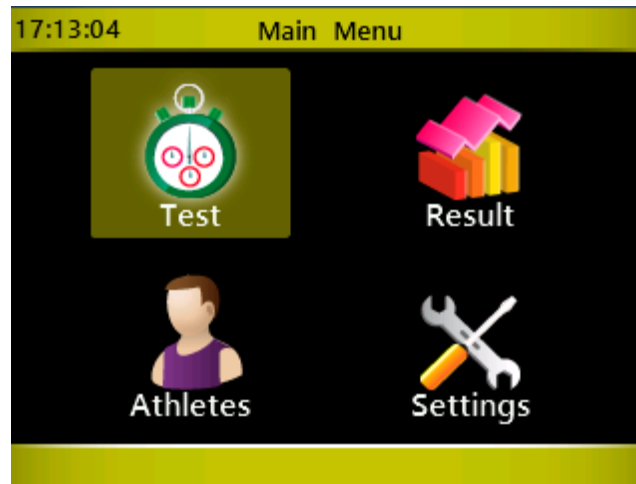
The symbol and colour to be followed is defined (e.g.  green); the other traffic lights will display nothing or other combinations of symbols and colours different than the one selected.



Catch this !

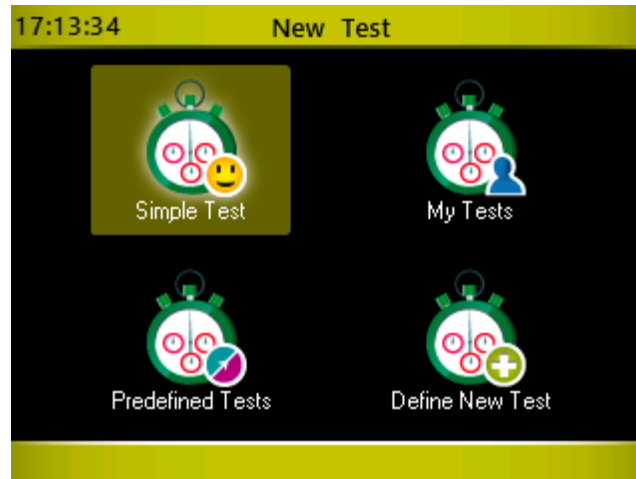
5 FUNCTIONS OF THE WITTY TIMER

The main menu displays the four macro areas, which will be described in the following chapters.



5.1 TEST

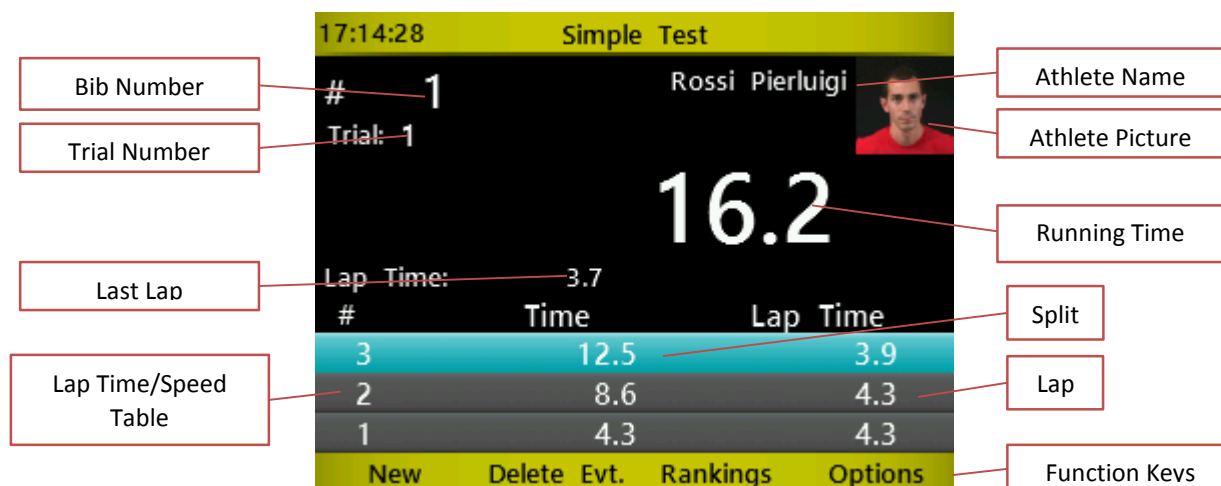
The Test section, the heart of the Witty software, allows to perform timing actions and define particular customized test types (this can also be carried out from the *Witty Manager* PC software).



5.1.1 SIMPLE TEST

The Simple Test is simply a 'Basic / In Line' test (see chap. 4.1.1) with a defined number of lap times (from 0 to n).

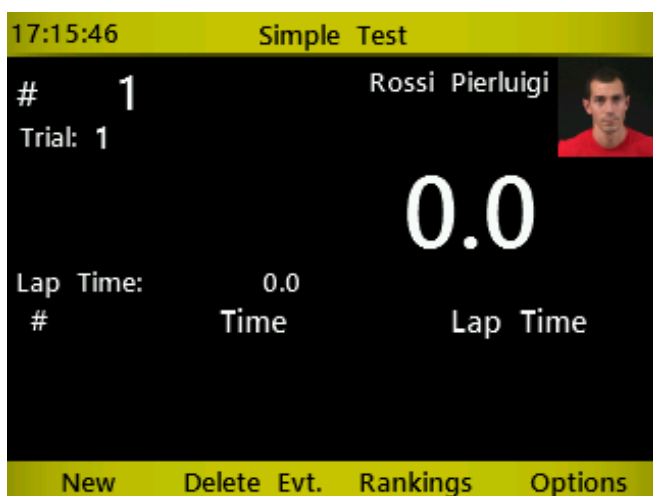
The elements displayed on the screen when timing are as follows:



In order to familiarize with the Witty timer functions, substitute the impulses received from the photocells by pressing the Start and Stop keys on the left side of the timer (lap times are simulated by pressing the <STA> key).

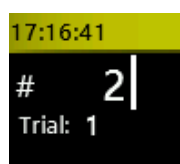


Press the Simple Test icon in the Test menu and access the timing function. If no start list and athlete names/pictures have been set with the WittyManager software, the displayed screen will appear as follows:



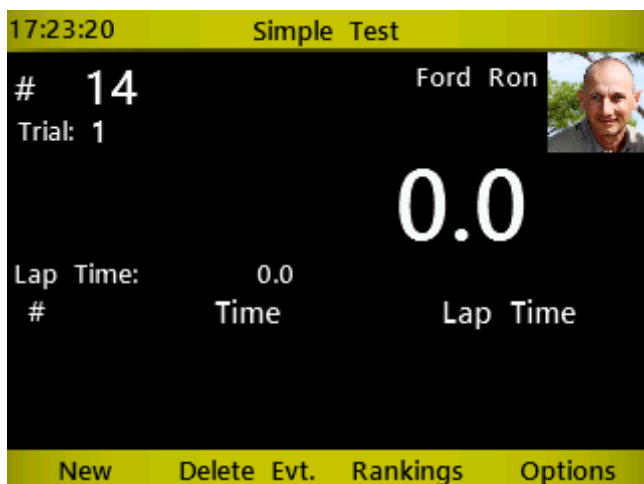
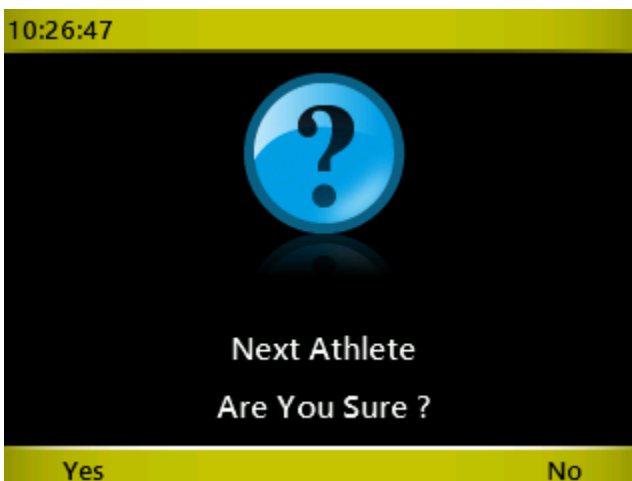
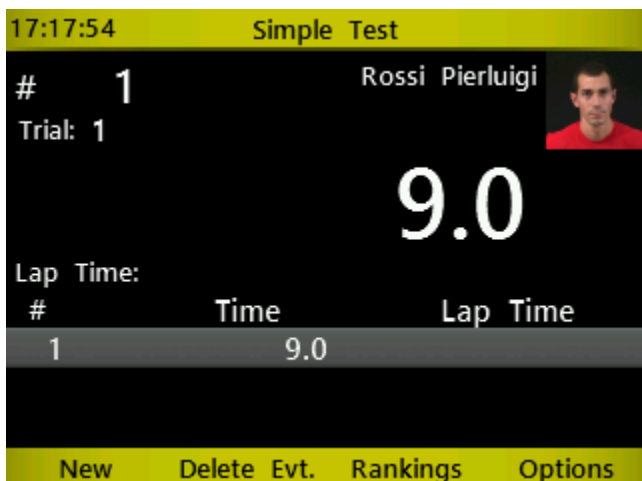
Now the athlete with bib number 1 can begin Trial number 1.

If another athlete is in starting position, enter his bib number using the numerical keypad and press <OK>.



Now have the athlete cross the Start photocell (or press the <STA> key) and timing will begin. When the photocell is interrupted for the second time, timing is stopped and the first line containing time and lap time (which of course are the same) appear in the table. After 3 seconds timing is resumed (as in this test type an undefined number of laps is possible and the photocells always give a Start/Lap impulse and never a Stop impulse).

Press <F1> New and the system asks, if you want to continue with another athlete. If so, the following athlete is suggested (bib no.+1 or, if a start list has been provided, the next one on the list).



If you enter the bib number of an athlete who has already carried out a trial, he will be accepted but the Trial number will be increased by one.



If there is more than one photocell for lap timing, the lap times are saved and displayed as a table which can be scrolled using the <up> and <down> arrows. The scrollbar on the right indicates that there are more lap times to scroll through.

17:14:28

Simple Test

1

Rossi Pierluigi



Trial: 1

16.2

Lap Time: 3.7

#	Time	Lap Time
3	12.5	3.9
2	8.6	4.3
1	4.3	4.3

New

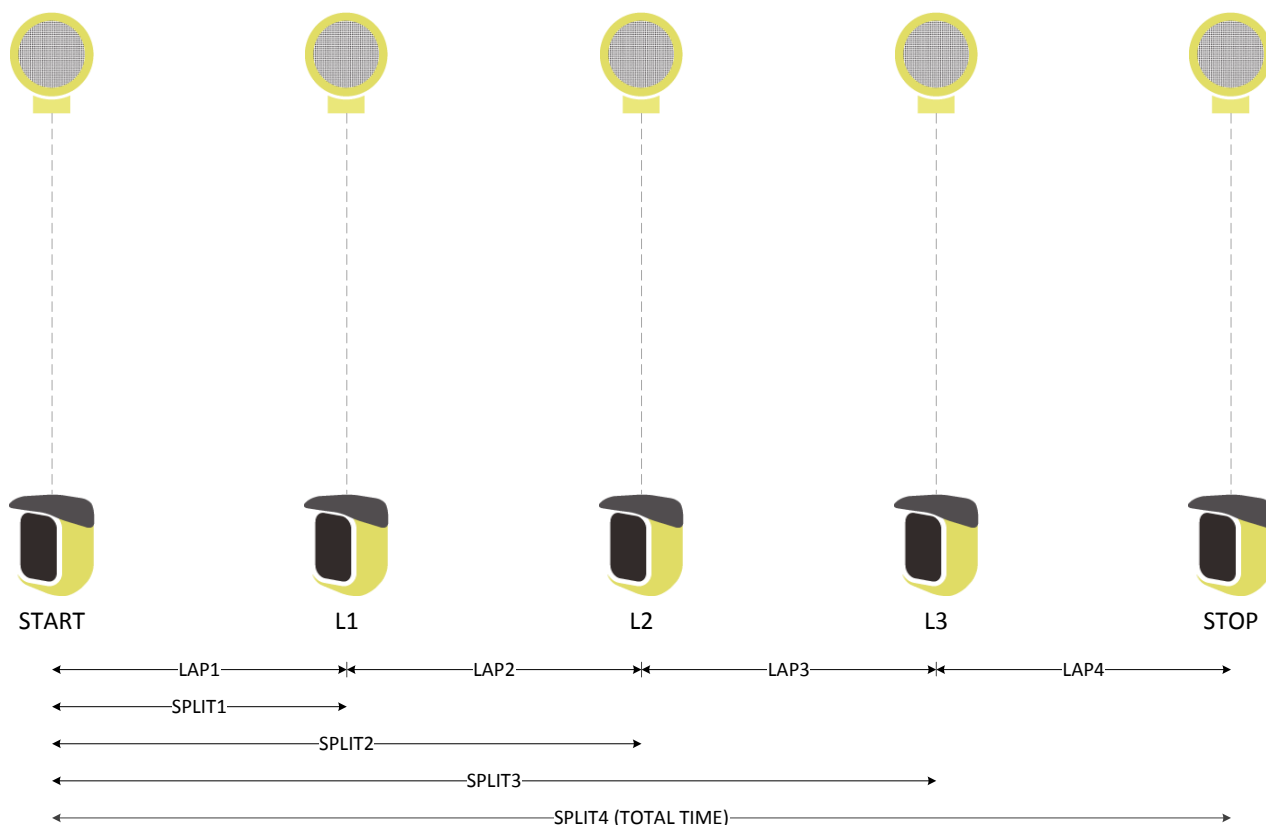
Delete

Evt.

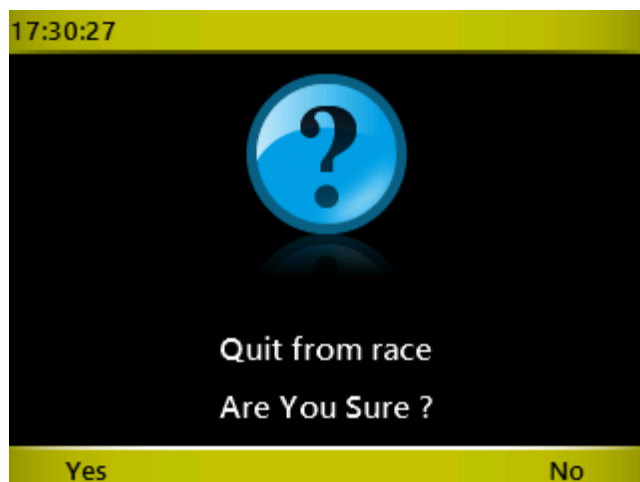
Rankings

Options

The Time column (SPLIT) is the running time beginning from the start, whereas the lap time (LAP) is the time of one single lap.



By pressing <Microgate> and confirming, the menu is closed.



If you want to begin a **New Test**, select the Simple Test icon again (or one of the other customized or predefined test types), whereas if you want to **continue the test** that you have just closed, use Continue in the Results menu, as described in chap. 5.2.

Now let's take a look at the various options that can be selected with the function keys:

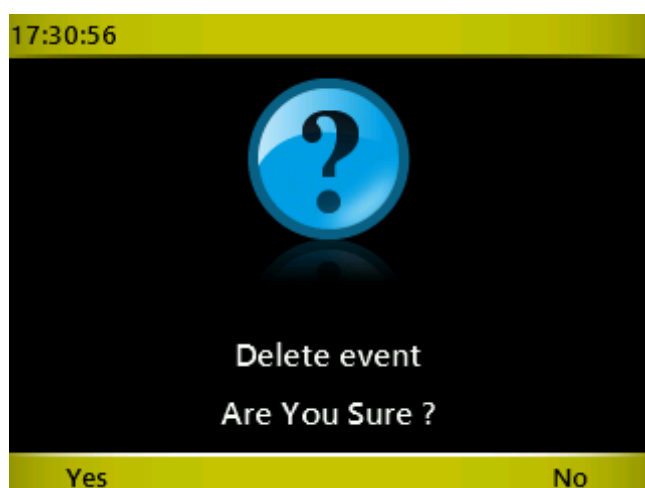
5.1.1.1 NEW

The next athlete (or the next on the start list) is suggested but confirmation is needed. A number may be forced by entering the digits and pressing <OK>.

5.1.1.2 DELETE EVENT

If an external element has interrupted a photocell causing an undesired impulse, the LAST EVENT (impulse) which has been received can be deleted by pressing <F2> Delete Event and confirmed by selecting Yes.

WARNING: The deleted item is always the last one, not the one highlighted in light blue in the table.



5.1.1.3 RANKING

Display the ranking of the current Trial (or of a given trial). A certain athlete's test can be displayed and the list can be sorted by time or bib number (to find an athlete).

17:33:06		Results	
Trial		1	
Rk	Num	Time	Name
1	6	0.5	Espino Cesario
2	9	0.5	Colombo Ennio
3	14	0.5	Ford Ron
4	8	0.6	Adler Peter
5	1	0.7	Rossi Pierluigi
6	7	0.7	Fierro Carlos
7	10	0.8	Frost Edward
View Sort Trial Cancel			

Use the <up> and <down> arrow keys to scroll the ranking and <F1> (or <OK>) to display the selected test (in this example the test of athlete number 1, Rossi).

5.1.1.3.1 View

View the selected test with all lap times (if present).

5.1.1.3.2 Sort

Sort the ranking by Time -<F1>- or Number (Bib) -<F2>-

5.1.1.3.3 Trial

Place the cursor on the 'Trial' dropdown menu in order to view a trial ranking or all trials together.

In this case the bib column (Num) has the format X.Y, where X is the bib and Y the trial (in the following example the athlete with the best time is athlete #1 in trial 1).

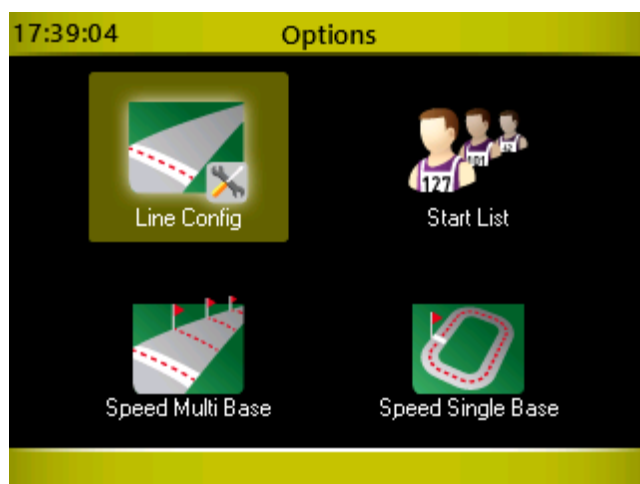
17:38:37		Results	
Trial		All	
Rk	Num	Time	Name
1	1.1	2.9	Rossi Pierluigi
2	9.1	3.3	Colombo Ennio
3	14.1	3.8	Ford Ron
4	10.1	4.4	Frost Edward
5	8.1	5.0	Adler Peter
6	7.1	5.4	Fierro Carlos
7	6.1	6.2	Espino Cesario
View Sort Trial Cancel			

5.1.1.3.4 Cancel

Press <F4> Cancel to return to the timing screen.

5.1.1.4 OPTIONS

Recall a menu for configuring lines, speed bases, and start lists:

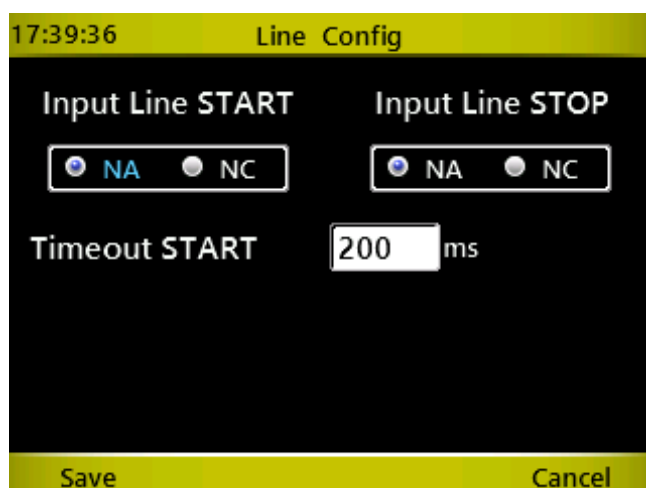


5.1.1.4.1 Line Configuration

Allows to configure the lines of possible peripherals connected via cable with the input jack on the back side.

It is possible to set the start and finish line to 'Normally Open' (NA) or to 'Normally Closed' (NC). For example a connected contact pad (Start Pad), which gives the start impulse when the athlete steps off it, is set to NC.

The start timeout is the so-called 'dead time'; setting it, for example, to 200 ms, after the start no other impulses will be considered within the first 2 tenths of a minute (this is useful to prevent false or spurious contacts).

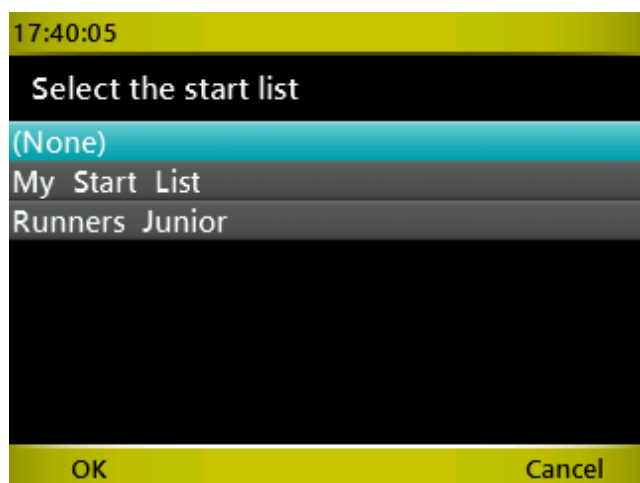


The screenshot shows the 'Line Config' screen with a yellow header bar displaying the time '17:39:36'. The screen is divided into two main sections: 'Input Line START' and 'Input Line STOP'. Each section has two radio buttons: 'NA' (Normally Open) and 'NC' (Normally Closed). In the 'Input Line START' section, the 'NC' button is selected. Below these sections is a 'Timeout START' field with a numeric input set to '200' and the unit 'ms'. At the bottom of the screen are two buttons: 'Save' and 'Cancel'.

5.1.1.4.2 Start Lists

If one or more Start Lists have been created with the Witty Manager software and transferred to the timer, with this option they can be chosen and used. From that moment the athletes will be placed in the order of the list and not of their bib number.

Choosing this option (None), the regular start order is used (1, 2, 3, 4, 5...).



The screenshot shows the 'Select the start list' screen with a yellow header bar displaying the time '17:40:05'. The screen has a black background with white text. The title 'Select the start list' is at the top. Below it is a list of options: '(None)', 'My Start List', and 'Runners Junior'. The '(None)' option is highlighted with a blue bar. At the bottom of the screen are two buttons: 'OK' and 'Cancel'.

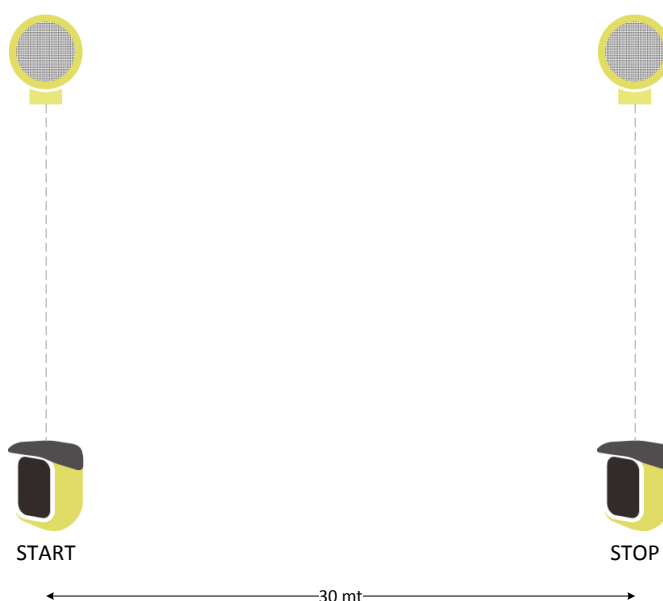
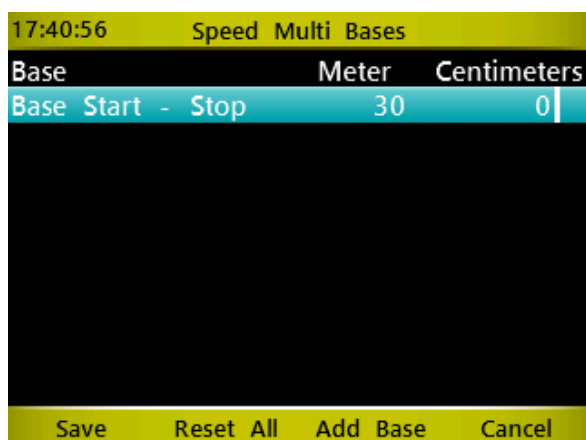
5.1.1.4.3 Multi Base Speed

This function (as well as the single Base) allows to define the distances between the photocells in order to determine the speed in the various trial laps. If the distances have been set in the time/lap table, the speed will be displayed (expressed in the chosen unit, see chap. 5.4.2.3).



The indication 'multi' does not mean that more than one base must be set. A classic sprint of n meters without lap can (and must) also be timed with this option. Let's see some examples:

30-Meter Sprint with Only One Start And Stop



Set the distance (in meters/centimeters or feet/inches depending on the settings of the measuring unit) between start and stop and press <F1> Save.

The diagram illustrates a 60m linear track layout. It features four stations: START, L1, L2, and STOP. Each station is represented by a yellow car icon and a yellow circular light icon, connected by a vertical dashed line. The track is divided into three segments: LAP1 (10m), LAP2 (20m), and LAP3 (30m). The total length of the track is 60m, labeled as START-STOP = 60 mt.

Enter the Start-Stop Base as in the previous example.

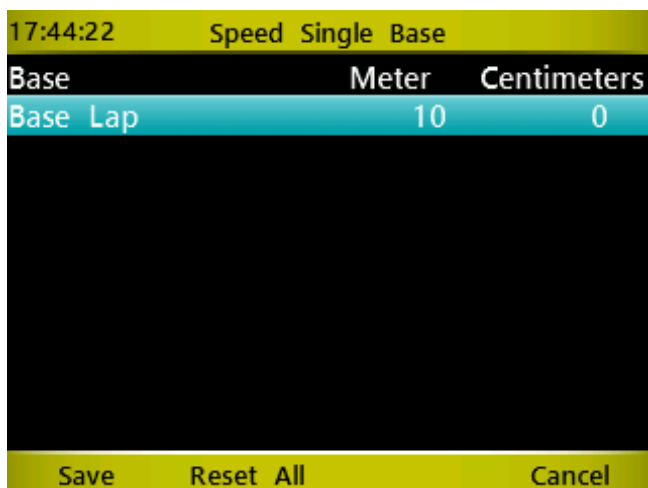
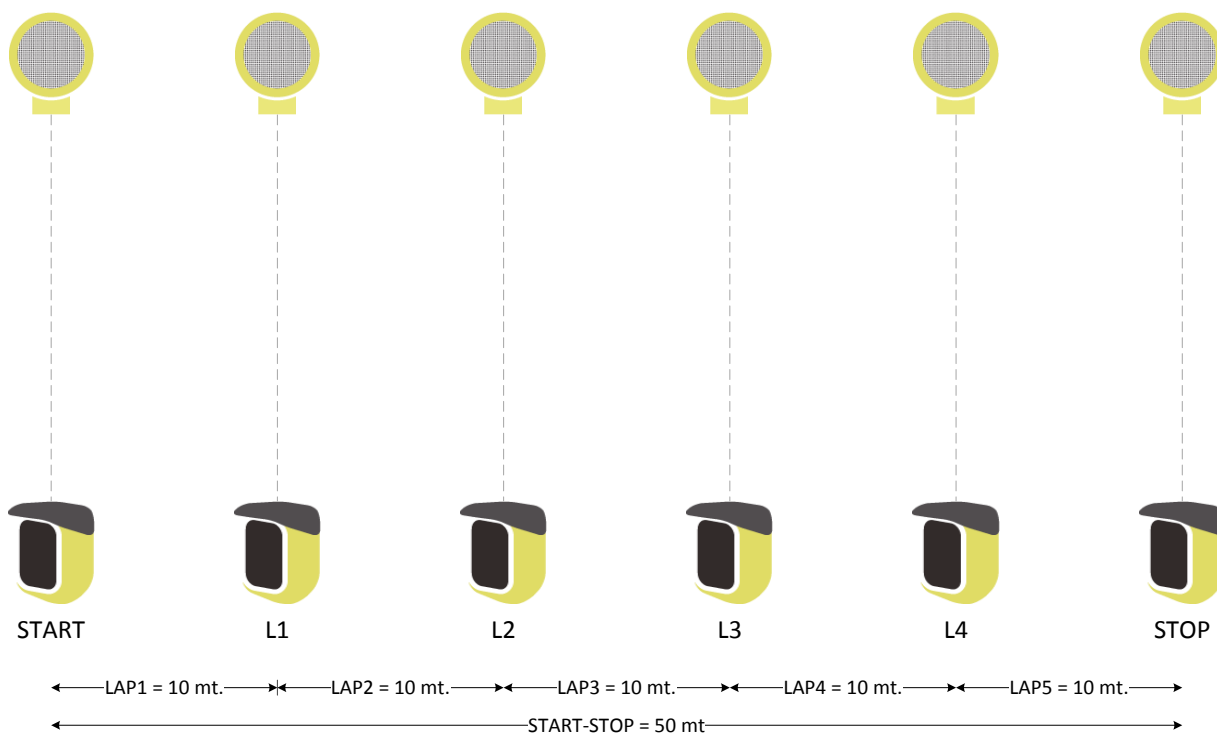
Do the same for the Lap2 and Lap3 bases.

You can move around in the table to change the distance of a previously added Base.

To delete one or more bases, press <F2> to reset the list and enter new data.

The Speed Single Base can be used also when there are several lap time measures at equal distances. In this case it is not necessary to define a multi base with equal distances, but it is enough to define the single base once, e.g.

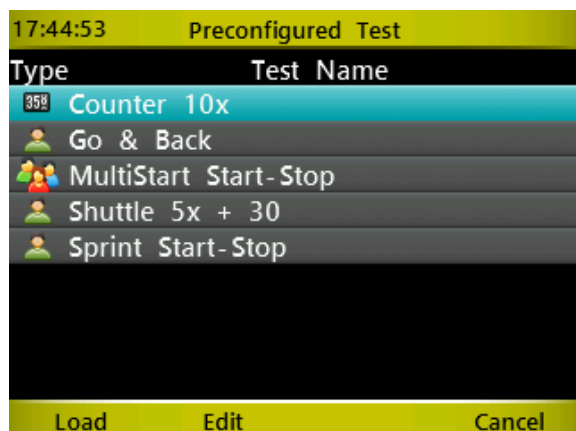
50-Meter Sprint with 10-Meter Lap Time.



Enter the Base Lap at 10 meters and save by pressing <F1>.

5.1.2 PRECONFIGURED TEST

On this screen there are 4 of the most common test types that *Microgate* has made available as examples



The tests are defined as follows:

Test Name	Description	Defined as
Sprint Start-Stop	Sprint test with start and stop without lap times	Test Type: Basic Mode: In Line End of Test: Number of Impulse Number of Impulse: 1
Go & Back	Go and back test with 1 photocell	Test Type: Basic Mode: Go & Back End of Test: Number of Impulse Number of Impulse: 1
Shuttle 5x + 30"	Shuttle test with 5 repetitions and 30" recovery	Test Type: Basic Mode: Shuttle with recovery Number of Impulse: 1 Number of Repetition: 5 Pause Time: 00 mm 30 ss
MultiStart Start-Stop	Generic group test	Test Type: Multistart Max Time: (Undefined)

Counter 10x	Test with 10 repetitions	Test Type	Counter
		First impulse	No
		End of trial	Number of impulses
		Number of impulses	10

5.1.2.1 LOAD

To begin a timing session of the desired type, select the line using the <up> and <down> arrow keys and press <F1> Load (or the <OK> key).

Now, thanks to these preconfigured tests, let's see an example for every test type:

5.1.2.2 SPRINT START-STOP: TIMING OF A BASIC IN-LINE TEST

The Test Base is this type of test; please refer to chap. 5.1.1 for further information.

5.1.2.3 GO & BACK: TIMING OF A BASIC GO & BACK TEST

The Go & Back test is also basically the same as an In-Line test; please refer to the latter for further information.

5.1.2.4 SHUTTLE 5x + 30": TIMING OF A BASIC SHUTTLE TEST

During the first sprint, the timer shows information as for an In-Line test; after crossing the stop photocell, a countdown starts for the amount of time set as recovery time:



When the athlete starts again for the second sprint, the advance or delay (signaled by an intermittent beep) is calculated with respect to the recovery time; these times are highlighted on the data table with the letter R (Recovery). In the example below the athlete has begun the second sprint with an advance of -1.4, and the third with a delay of +1.6.

#	1	Rossi Pierluigi	
Trial:	1		
		21.3	
Lap Time:	21.3		
#	Time	Lap Time	
R 3	+1.6		
2.1	6.2	6.2	
R 2	-1.4		

The ranking sums the times of n repetitions and does NOT consider the start delays or advances.

5.1.2.5 MULTISTART START-STOP: TIMING OF A MULTISTART TEST

Now let's take a look at the user interface of a multistart timing test.



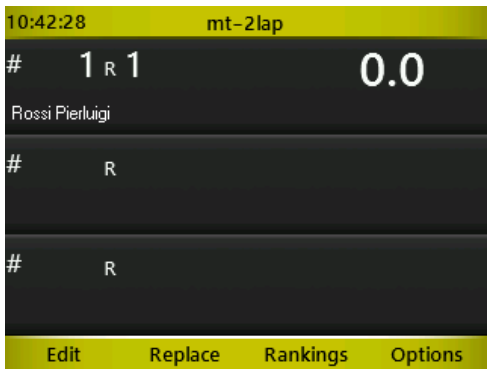
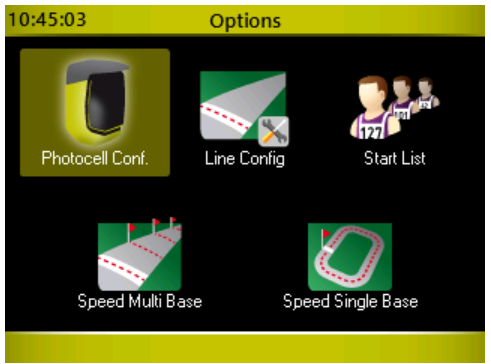
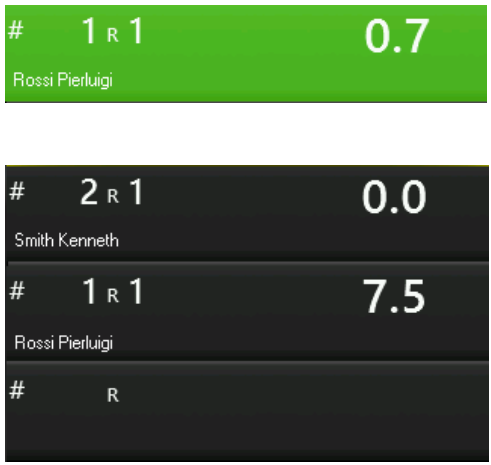
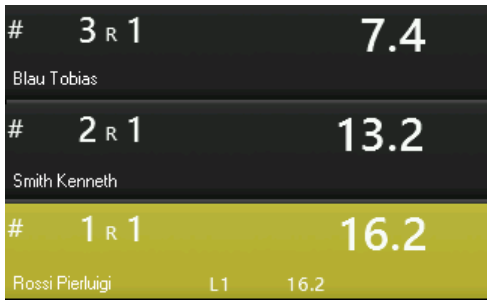
Top Screenshot: Multistart3Lap

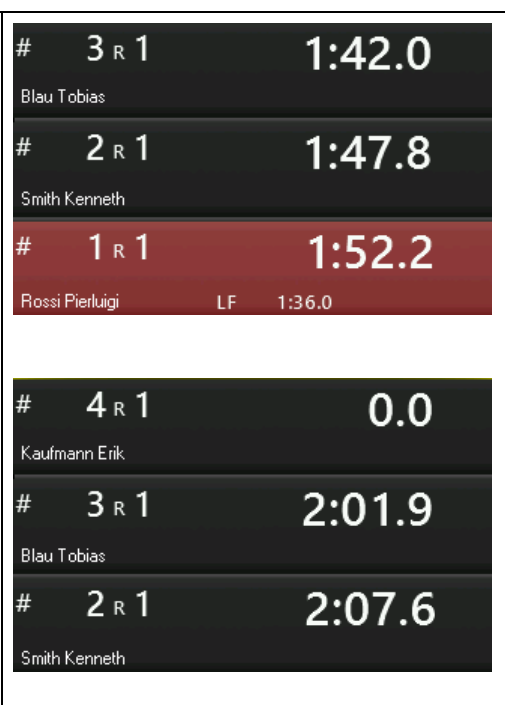
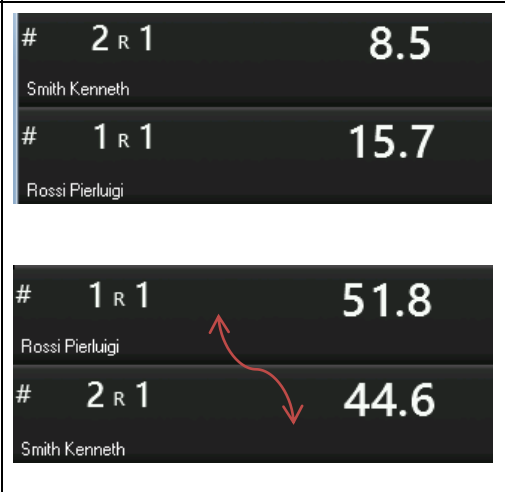
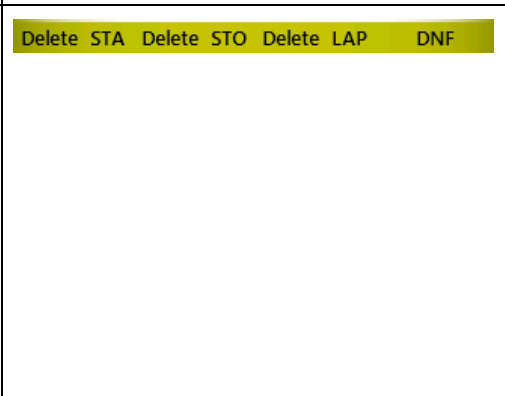
Bib Number (#)	Athlete Name	Trial Number (Run)	Running Time	Lap n Time	Lap Number
3	Blau Tobias	1	18.8	11.2	1
2	Smith Kenneth	1	26.2	12.5	1
1	Rossi Pierluigi	1	33.2	17.3	1

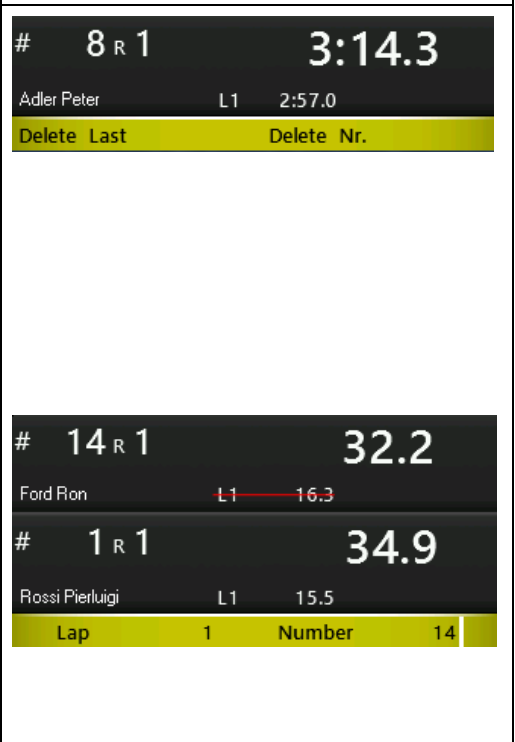
Bottom Screenshot: Multistart3Lap

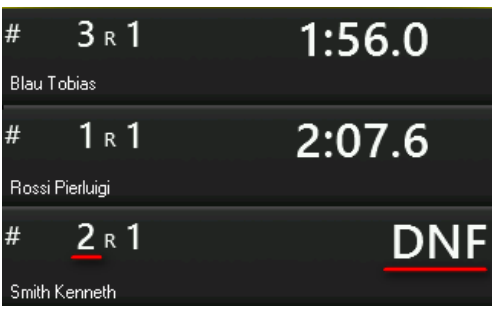
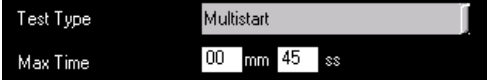
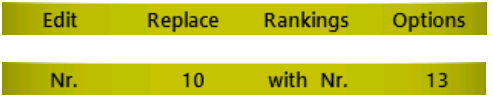
Bib Number (#)	Athlete Name	Trial Number (Run)	Running Time	Lap1 speed	Stop speed
3	Blau Tobias	1	2.6		
2	Smith Kenneth	1	11.8	3.05kmh	
1	Rossi Pierluigi	1	21.3		5.07kmh

Legend: Green = Start, Yellow = Lap, Red = Stop

At the beginning of the test, athlete #1 is ready to start (or the first of the Start List, if one has been set). If you want to force another bib number, just type it using the numerical keypad and confirm by pressing <OK>.	
If the photocells have not been configured in the test definition (see chap. 5.1.4), it must be done now. Press <F4> to access this option or other available options.	
Athlete #1 starts, his sector becomes green for 5 seconds and then scrolls down to get ready for the next athlete.	
Similarly, when number #3 starts, the first two athletes scroll down. If a LAP impulse is received, the sector of the athlete generating it turns yellow.	

When the athletes cross the finish line (stop impulse), the final time is showed in red for 5 seconds and then disappears to show the next athlete starting.	
If an athlete passes the athlete in front of him, the athletes can be changed on the fly, while they are running, using the <i><up></i> and <i><down></i> arrow keys. For example, athlete #1 started before #2... after approx. 40 seconds, passing takes place and the impulses must be assigned to #2. Just press <i><down></i> to replace the athletes (press <i><up></i> to replace them again).	
It is also possible to delete undesired events or consider an athlete as 'Not Arrived'; press <i><F1></i> Edit to access the following options: <i><F1></i> Delete STArt <i><F2></i> Delete STOp <i><F3></i> Delete LAP <i><F4></i> NA (Not Arrived)	

Pressing one of the first 2 function keys, the <u>last</u> event of that type received (start or stop) is deleted. Confirmation is required and if you press Yes, the line status is reset to the previous status (if you delete a Start, the athlete is reset to the start, but if a Stop is deleted, his time starts running again).	
By pressing <F3> you can delete a Lap. You can choose to delete the last received Lap event or be more precise and indicate the Lap number and the athlete that it was assigned to. Press <F1> Delete Last to delete the last Lap (confirmation required) Press <F3> Delete Number and enter the Lap and Bib Number to delete a specific event (in the example Lap 1 of athlete #14 will be deleted).	
If you want to 'disqualify' an athlete (or consider him 'not arrived'), just press <F4> NA in the Edit sub menu. If there are several simultaneous athletes, you will need to confirm the one to be deleted. Using the keys F1 to F4 select the bib of the athlete to remove (in the example #2) . Instead of the arrival time the writing DNF (Did not finish) is displayed.	

	
The writing DNF is also displayed if in the Multistart test definition a maximum time has been set for finishing the execution and one of the athletes has exceeded that time.	
The times of two athletes can be replaced using <F2>Replace. Enter the bibs of the athletes we want to replace. All times of the first athlete (#10) will be assigned to the second one (#13).	
Press <F3> Rankings to view the ranking.	

5.1.2.6 COUNTER 10x: TIMING OF A COUNTER TEST

The test starts when the first impulse is received and in the center the counter increases with every event. After 10 impulses (excluding start), the test is finished.

17:07:58		10Counter	
#	1	Rossi Pierluigi	
Trial: 1		Impulses: 10	
			
		8	
Time	9.2		
#	Time	Lap Time	
8	6.1	1.9	
7	4.2	1.2	
6	3.0	0.5	
New		Delete	Evt. Rankings Options

The options available with keys <F1> to <F4> are similar to the ones for the Basic Test.

5.1.3 MY TESTS

In this screen you will find all customized test types defined by the user (directly on the timer or via the Witty Manager software).



The icon in front of the name indicates the test type (Basic, Multistart, Counter).

5.1.3.1 LOAD

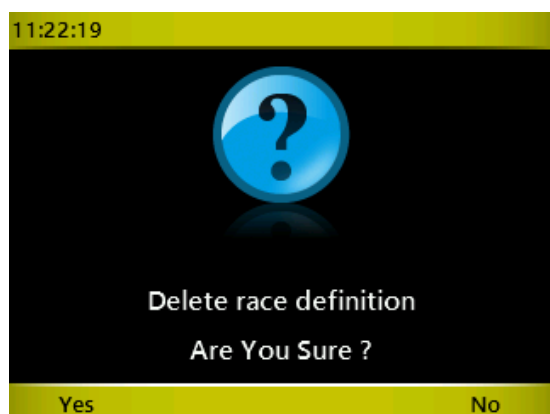
To begin a timing session of the desired type, select the line using the *<up>* and *<down>* arrow keys and press *<F1>* Load (or the *<OK>* key).

5.1.3.2 EDIT

Allows to display the general settings of the test type or edit the Options (configuration of lines, speed bases and, for multistart tests, photocell configuration). Editing of definition parameters is not available, because if trials of that type were already carried out, it would not be possible to compare them with the new ones.

5.1.3.3 DELETE

Delete the customized test type. Confirmation is required:



NB: Only the test definition is deleted; any possible trials of that type will NOT be deleted.

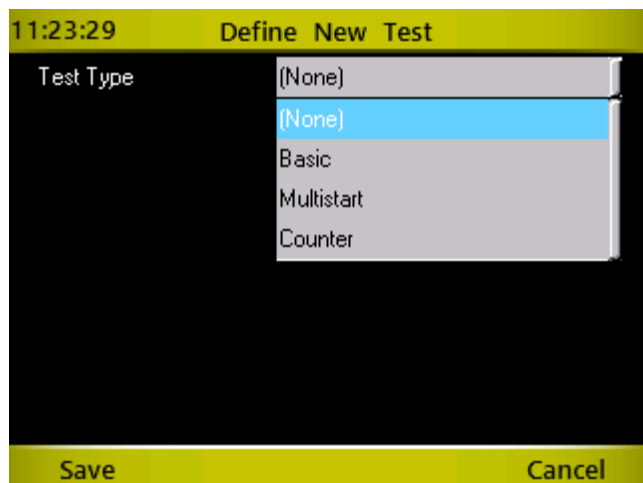
5.1.3.4 CANCEL

Exit the previous menu.

5.1.4 DEFINE NEW TEST

With this option new customized test types can be defined. Please refer to chap. 4 for further information on the various available test types and relevant options.

Choose the test macro type by pressing <OK> to open the dropdown menu, scroll up or down with <up> or <down>, and confirm with <OK>.



11:23:29 Define New Test

Test Type (None)

(None)

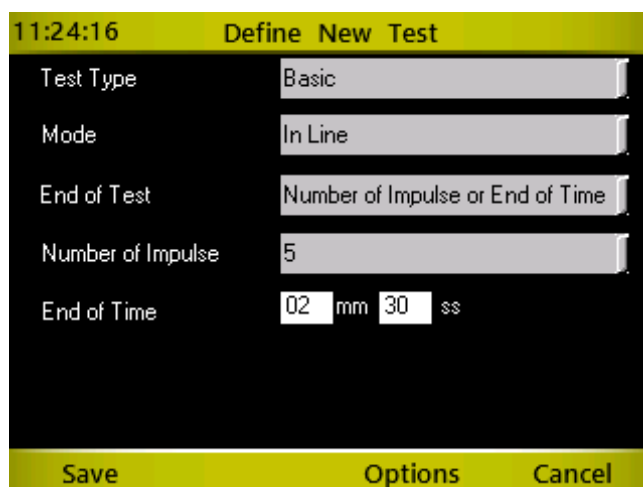
Basic

Multistart

Counter

Save Cancel

Depending on the chosen options, additional dropdown menus or numerical fields to be completed with the necessary information are displayed.



11:24:16 Define New Test

Test Type Basic

Mode In Line

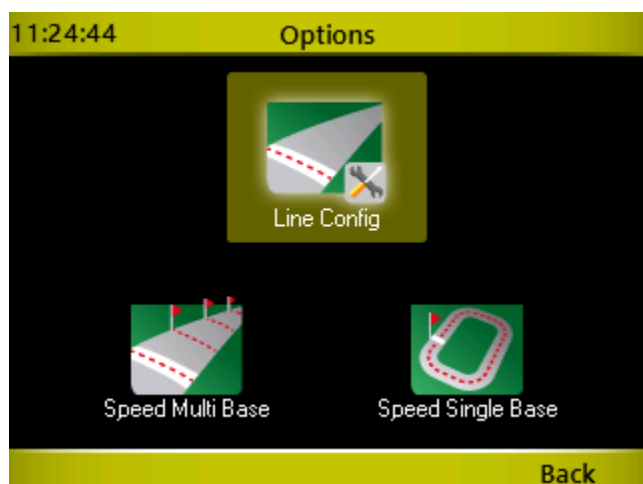
End of Test Number of Impulse or End of Time

Number of Impulse 5

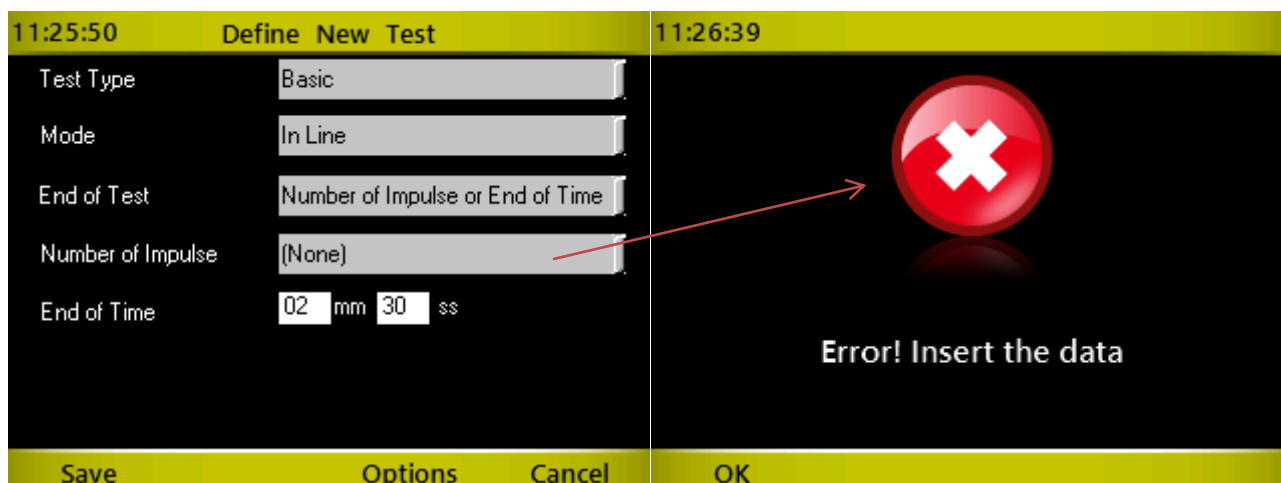
End of Time 02 mm 30 ss

Save Options Cancel

By pressing <F3> Options you can configure Lines and Speed Bases as explained in chap. 5.1.1.4. For MultiStart tests a menu item for configuring photocells will also be displayed.



Press <F4> Back to go back to the test definition.



Press <F1> to save the Test definition. A consistency check is carried out on the data and if any dropdown menu or field has not been filled, an error mask will warn the user. By pressing <F4> (after having confirmed) the screen is closed without saving.

If all fields have been completed correctly, after pressing Save the user will be asked to name the customized test definition.

A name such as MyTestTYPEnn is suggested. For example, MyTestBasic1, MyTestCounter2, etc.

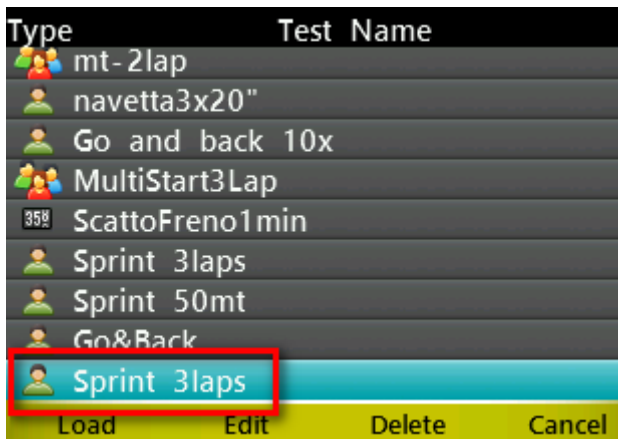
If the name is okay, confirm again by pressing <F1> Save, whereas if you want to change it to something easier to remember and more significant (recommended), use the virtual keyboard (remember that to make this easier it is possible to create definitions using the *Witty Manager* software and then transfer them via USB to the timer).

If you choose a name which has already been used in a previous test definition, the user will be prompted to choose another one (this happens also if you have deleted the previous definition but there are trials associated to that definition).

Please refer to chap. 2.4.1 for information on how to use the virtual keyboard.



After having saved the test with <F1>, it will be displayed with the same name in the list named 'My Test' (chap. 5.1.2).



5.2 RESULTS

This function allows to show the results of the tests carried out or to continue an interrupted trial.

11:32:47 Result List		
Type	Date-Time	Test Name
	24/10/12 10:32:12	navetta3x20"
	24/10/12 10:31:37	navetta3x20"
	24/10/12 10:30:59	MultiStart Start-St
	24/10/12 10:26:35	Simple Test
	23/10/12 17:53:02	Counter 10x
	23/10/12 17:50:54	Go & Back
	23/10/12 17:50:31	Sprint Start-Stop
	23/10/12 17:41:29	Simple Test
	23/10/12 17:36:36	Simple Test
Show Continue Sort/Filter Delete		

The data table displays 3 columns with the following:

- the test type (Basic, MultiStart, Counter)
- the date and time of the test start
- the test name (predefined or customized basic test)

Possible Options are:

5.2.1 SHOW

By selecting a test with the *<up>* or *<down>* arrow keys and pressing *<F1>Show* (or *<OK>*) you access the trial ranking. The available Options in the ranking are similar to those in the previous chapters.

5.2.2 CONTINUE

Access the timing screen of the selected test and continue the test from the last athlete ready to start (bib n+1, or the one selected from a start list, or the first athlete with trial number increased by 1).

5.2.3 SORT/FILTER

Select this option to access one of the two sub-options (*<F1>Sort*, *<F2>Filter*); press *<F4>* to go back to the previous menu.

Sort	Filter	Cancel
------	--------	--------

5.2.3.1 SORT

By selecting one of the three Options (*<F1>By Type*, *<F2> By Date*, *<F3>By Name*) the result list is sorted by the selected column.

By Type	By Date	By Name	Cancel
---------	---------	---------	--------

Sorting **by Type** the order is the following: Basic, MultiStart, and Counter.

By Date sorting is descending (most recent tests are at the top of the list).

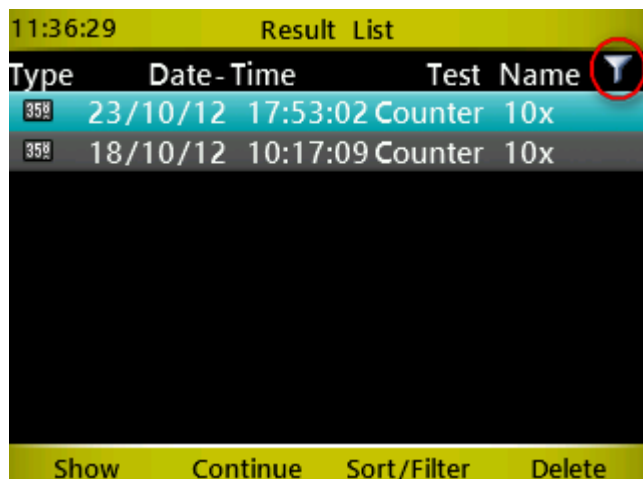
By Name sorting is alphabetical.

5.2.3.2 FILTER

In case of many tests it is possible to browse (filter) the list by test name or by date range (from... to...). The filter remains active even if you exit the main menu and then enter the Results item. To reset it and display all records, see chap. 5.2.3.3

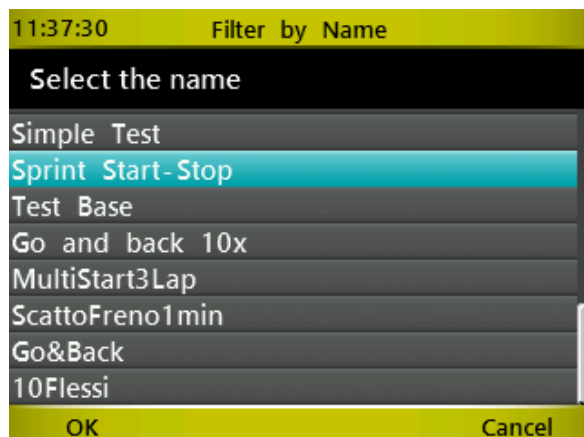


An icon beside the column for which the list has been filtered (Test Name or Date) indicates that there is an active filter.



5.2.3.2.1 Filter by Name

A unique list of all present test names in the result list is displayed. Choose a name from the list by selecting it and pressing <F1> or <OK>. The Result List displays only the trials of that given type.



5.2.3.2.2 Filter by Date

Enter two dates (the second identical or subsequent to the first one) to find the trials carried out during that period of time. The filter is NOT cumulative (i.e. any filter by Name previously entered will be reset).

11:38:05 Filter by Date

From Date
(DD/MM/YYYY)

15 / 9 / 2012

To Date
(DD/MM/YYYY)

30 / 9 / 2012

OK Cancel

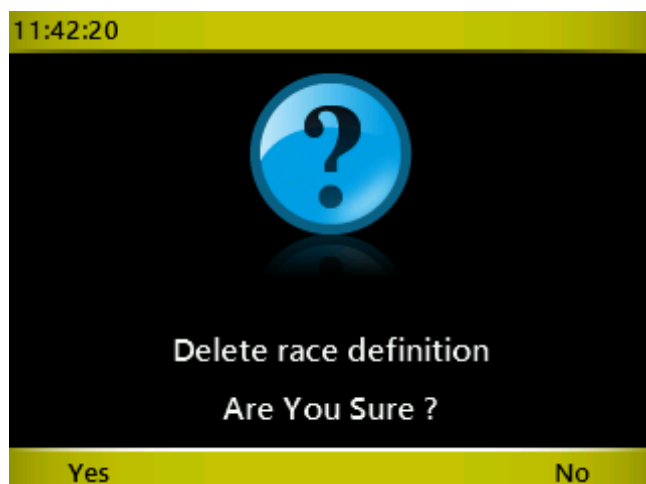
5.2.3.3 RESET FILTER

Resets all set filters and shows the complete result list.

5.2.4 DELETE

Deletes the selected trial. Confirmation is required.

WARNING: If the results have not been transferred to the PC via the *Witty Manager* software, the trial will be irreparably deleted and it will not be possible to recover it.



5.3 ATHLETES

If the athletes' personal data has been transferred via the Witty Manager software, this function allows to display them.

Accessing the Athlete List menu the list of available athletes with bib, name and birth date will be displayed.

11:42:49 Athlete List		
#	Name	Date
8	Adler Peter	05/04/1971
3	Blau Tobias	28/08/1973
15	Brunelle Nicolas	12/06/1973
9	Colombo Ennio	02/09/1973
11	Conti Aldo	30/10/1974
6	Espino Cesario	20/12/1975
7	Fierro Carlos	02/05/1972
14	Ford Ron	23/02/1969
10	Frost Edward	21/05/1972
View Sort Delete Cancel		

5.3.1 SHOW

Displays the athlete's personal data, including the picture and notes (if present). Press <F4> or <Microgate> to go back to the list.

11:43:19 Athlete	
First Name:	Pierluigi
Last Name:	Rossi
Birth Date:	22/01/1976
Gender:	M
	
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce fermentum aliquet ligula, in adipiscing orci semper nec. Ut nunc tortor, sodales id lobortis sed, euismod eu lacus.	
Cancel	

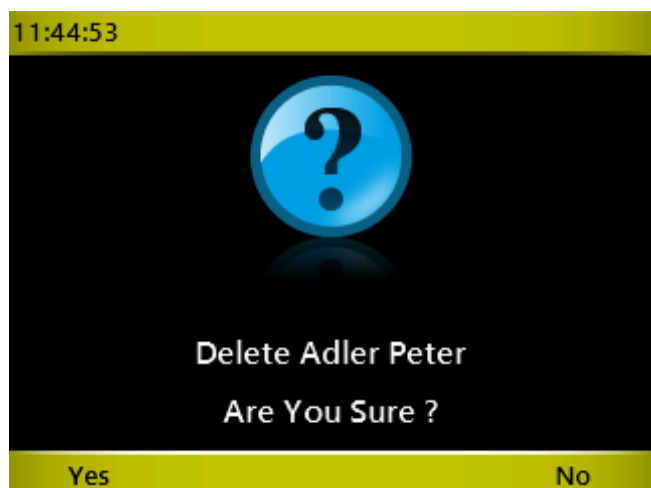
5.3.2 SORT

Press <F2> to display the various sorting options: <F1> = by name, <F2> by bib.

11:44:15 Athlete List		
#	Name	Date
1	Rossi Pierluigi	22/01/1976
2	Smith Kenneth	16/02/1974
3	Blau Tobias	28/08/1973
4	Kaufmann Erik	12/11/1976
5	Gamache Dominic	25/09/1972
6	Espino Cesario	20/12/1975
7	Fierro Carlos	02/05/1972
8	Adler Peter	05/04/1971
9	Colombo Ennio	02/09/1973
By Name By Bib Cancel		

5.3.3 DELETE

An athlete can be deleted from the list; therefore if his bib number is entered, it will not be associated to that name. Any tests that have already been carried out by that athlete are NOT deleted and will be associated to that name (i.e. the athlete's data is always written in the test, not only a link between the trial and the athlete is kept).



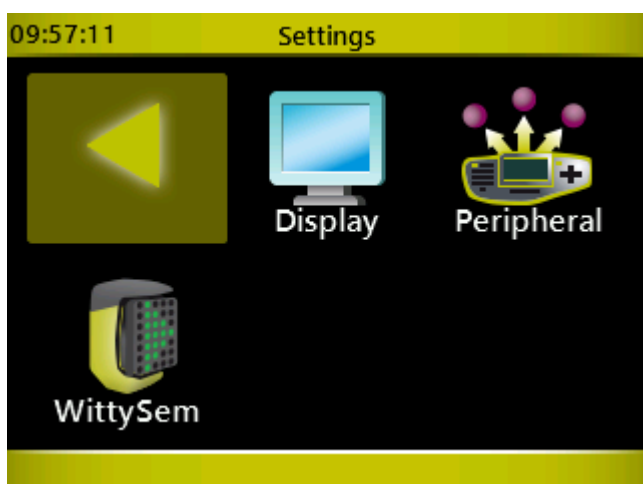
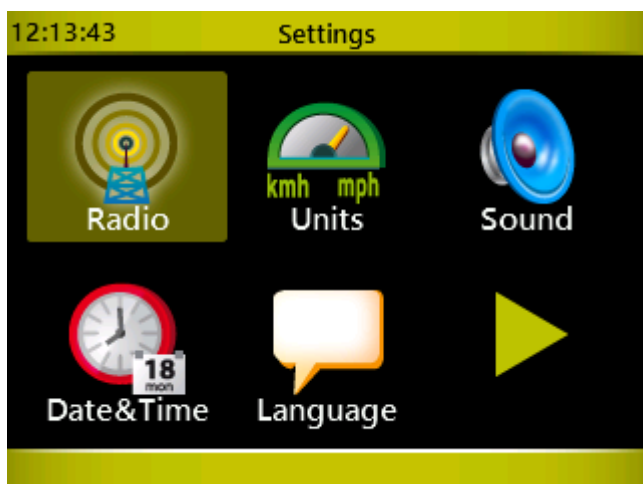
5.3.4 CANCEL

Go back to the main menu.

5.4 SETTINGS

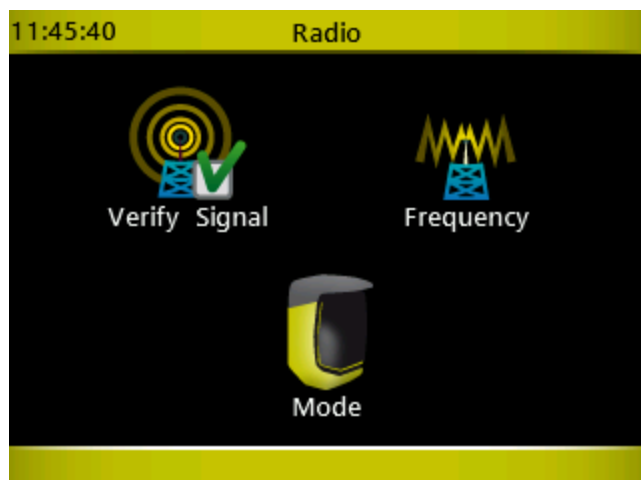
This option allows to set and configure several parameters of the Witty system.

Use the triangle-shaped "next/previous" icon to go from one screen to the next or to the previous one.



5.4.1 RADIO

In this section the wireless transmission between the Witty timer and the photocells is configured.



5.4.1.1 VERIFY SIGNAL

Once you enter the Verify Signal section, the timer awaits an impulse from the photocells, from Witty-SEM or Witty-RFID.

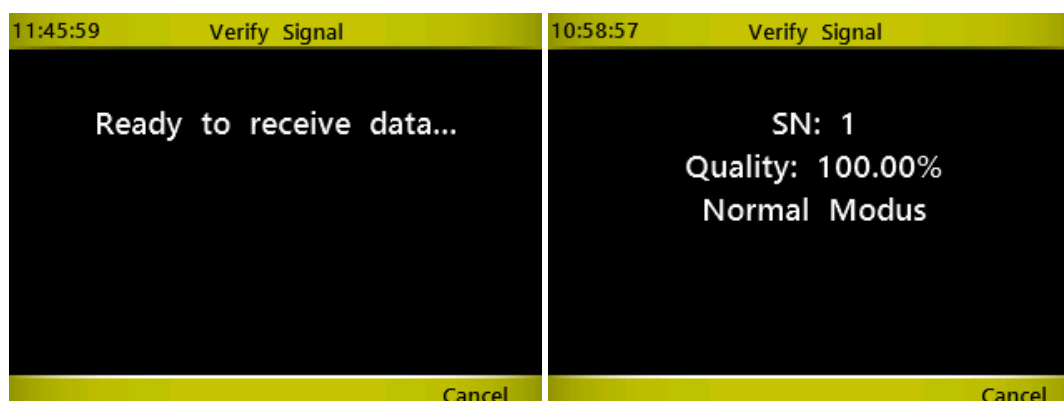
Interrupt one photocell after the other with your hand to verify that they are functioning correctly.

After having received the impulse, the serial number of the photocell, the signal quality (100% = excellent), and the mode (*normal* or *strong*) to which it is set are displayed (see chap. 5.4.1.3).

If Witty does not display anything, it is possible that the transmission channel of the timer and the photocell differ. Please refer to chap. 5.4.1.2 to set the correct channel.

Regarding the Witty-SEM signal test, Witty-SEM puts itself in on-hold status and shows its index (A, B, C...) in red color; please put your hand close to the Witty-SEM to test the signal quality.

Regarding the Witty-RFID signal test, please put one of the RFID tag close to the RFID so that the test signal starts: besides signal quality percentage, the recorded bib number and the Radio Power mode (Normal/Short) will also be shown.



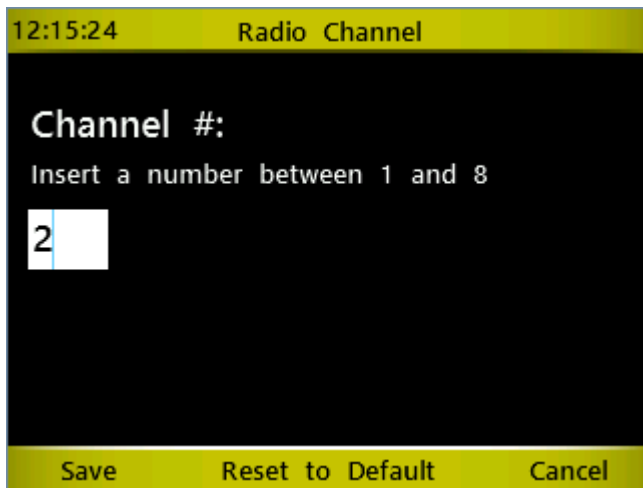
5.4.1.2 FREQUENCY

To prevent frequency collisions with other Witty Kits on the field, it is possible to change the transmission channel (of both the timer and photocells, which must of course have the same channel).

Put the n photocells that must be set into 'configuration mode': turn off the photocells and then press and hold the on/off button for 5 seconds (see chap. 2.2.2). When all photocells have a red blinking status LED, on the Witty timer enter the channel number using the numerical keypad (from 1 to 8) and press Save (F1).

The photocells, which have just received the command, emit a two-tone beep, restart and are turned on in normal mode. Use the Verify Signal function (chap. 5.4.1.1) to ensure that the channels have been set correctly.

The “Reset Default” (F2) button resets the initial photocell conditions, i.e. Mode=*Normal* and RadioPower=*Normal*, Activation Mode =*Normally Open* (see the following chapter; activation can be changed only using the Witty Manager software).



The same applies to Witty·SEM e Witty·RFID accessories.

5.4.1.3 PHOTOCELL MODE

The photocells can be configured to function with two different modes depending on the minimum and maximum distance between them and the reflector and with 2 different “radio-power” mode (see chap. 2.3.1)

To set one of the two modes, proceed as if changing the channel: put the photocells in configuration mode (when switched off press the On button and hold it for 5 seconds, see chap. 2.2.2), on the Witty timer choose one of the two modes and press *OK*. The same two-tone beep as before signals that the signal has been sent.



The screenshot shows a configuration menu on a black background with yellow text. At the top left, the time '12:18:28' is displayed. The menu has two main sections: 'Mode' and 'Radio Power'. Each section has two radio button options. The 'Mode' section has 'Normal' (selected) and 'Strong'. The 'Radio Power' section has 'Normal' (selected) and 'Short'. At the bottom, there are two buttons: 'Save' and 'Cancel'.

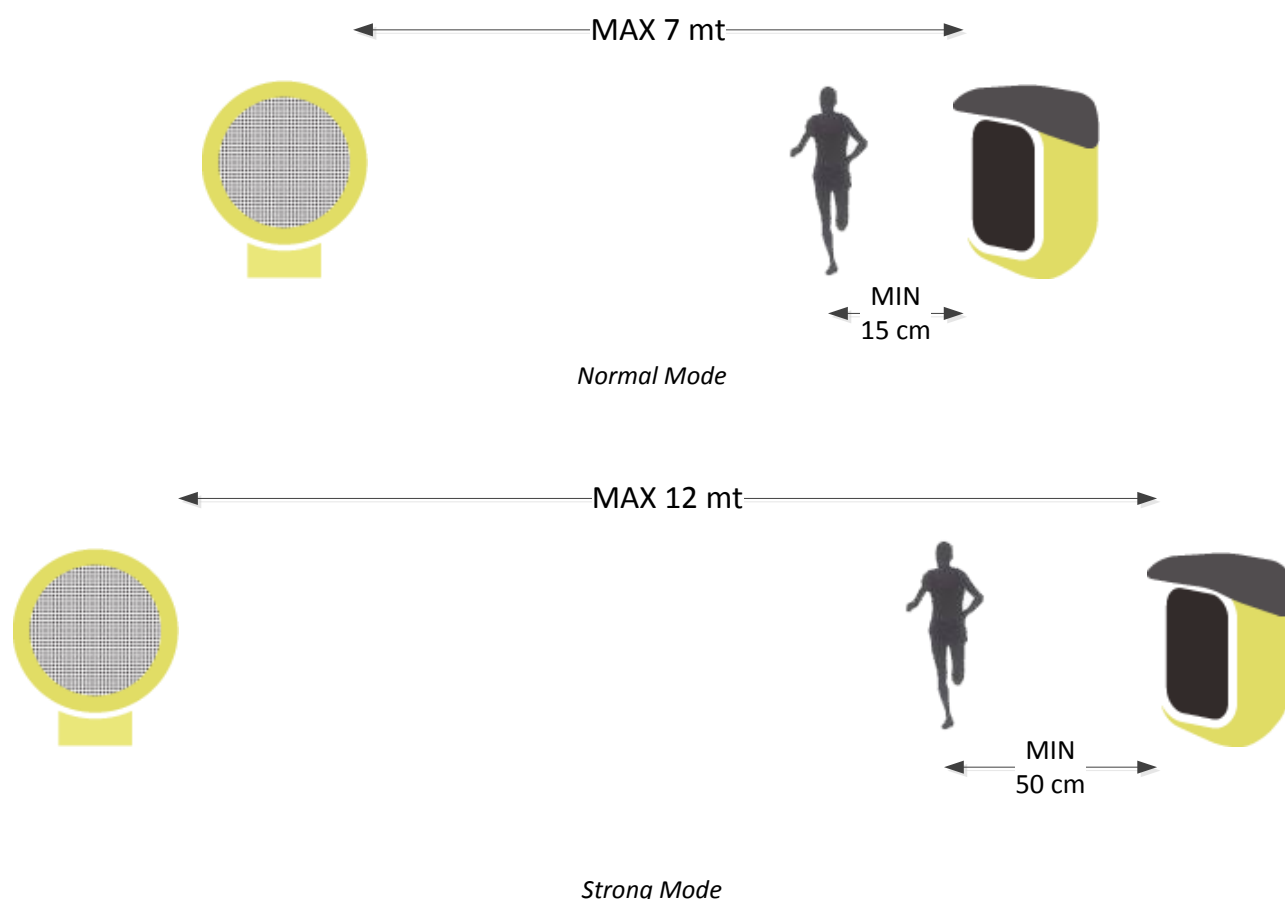
Setting	Option 1	Option 2
Mode	☒ Normal	☐ Strong
Radio Power	☒ Normal	☐ Short

Save Cancel

5.4.1.3.1 Mode

Depending on the position of the two tripods (e.g. outside the 8 lanes of an athletics track) and how close to the photocells the athletes will pass, the photocells can be set as follows:

In 'Normal' mode the maximum distance between photocell and reflector is 7 meters, whereas in 'Strong' mode it is 12 meters. The latter, though, does not record passages, if the athlete passes too close to the photocell (minimum distance of 50 cm).



5.4.1.3.2 Radio Power

The Radio Power parameter indicates the duration of the impulse transmission set for "Normal" mode at 1.2 sec. and for "Short" mode at 0.4 sec.

As explained in chapter 2.3.1, lowering the impulse duration (setting Radio Power to "short") has some advantages if there are two photocells, which are very close one to another, but decreases the transmission quality in the long run and therefore system reliability.

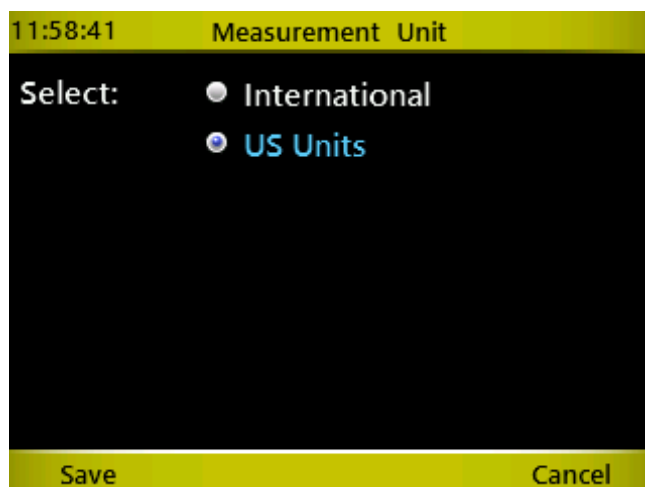
5.4.2 UNITS

In this section it is possible to set the measurement unit for distances and speeds, and time displaying accuracy.



5.4.2.1 MEASUREMENT UNIT:

Choose International or US Units as measurement unit type. This choice affects the measurement unit for distances and Speed Bases (International = Meters/Centimeters, US Units = Feet/Inches).



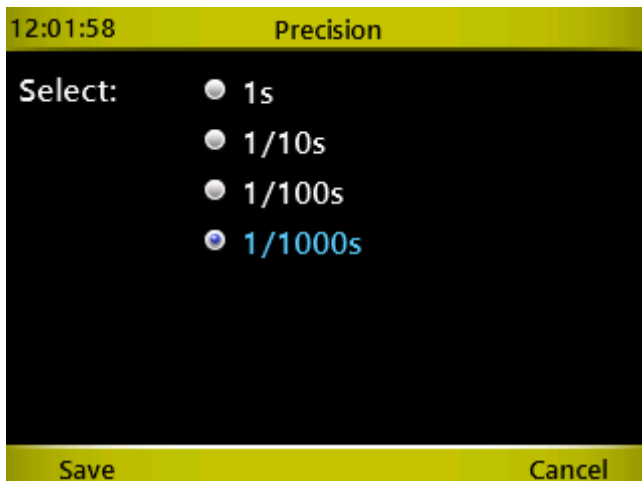
12:00:39 Speed Single Base				11:59:41 Speed Single Base			
Base		Meter	Centimeters	Base		Feet	Inches
Base	Lap	10	0	Base	Lap	525	0
Save		Reset All		Cancel			

5.4.2.2 PRECISION

Choose the time displaying accuracy (seconds, tenths, hundredths, or thousandths) for timing, rankings, and result lists.

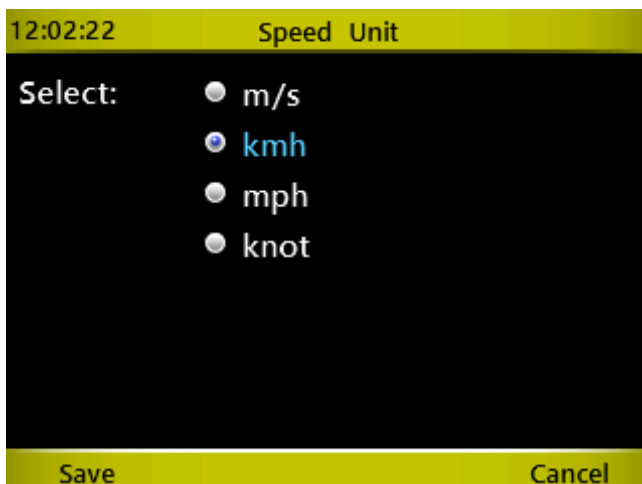
It is important to know that this configuration sets only the displaying of times, which are always calculated as accurately as possibly, regardless of the configuration (1/25000 seconds).

Similarly data exporting to PC via WittyManager software is also always carried out with the highest accuracy and will not be affected by this function.



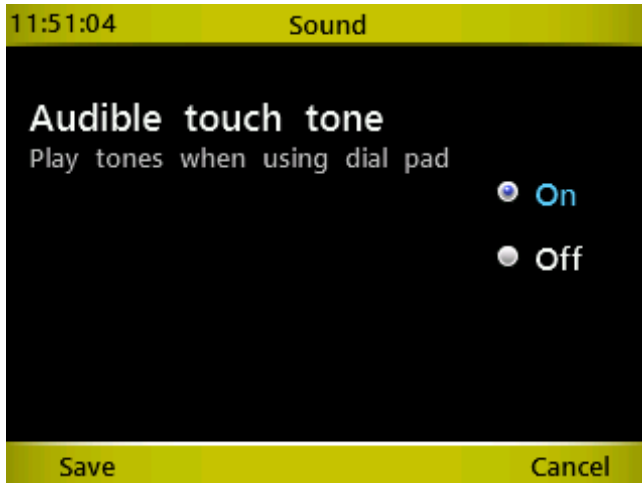
5.4.2.3 SPEED

Enter the measurement unit (choosing between meters per second, km/h, miles/hour, and knots) for displaying the speeds, if the lengths have been entered in the relevant bases.



5.4.3 SOUND

Enables or disables the beep tone emitted when pressing a key.



Using the *<up>* and *<down>* arrow key select one of the two options and press *<OK>*. Press *<F1>* to save or *<F4>* to cancel.

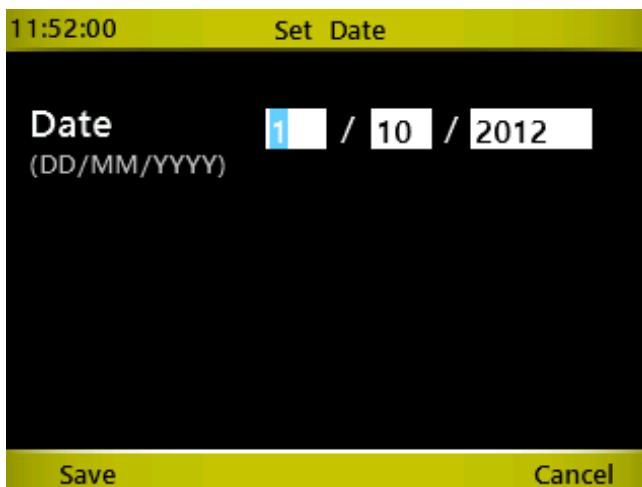
5.4.4 DATE & CLOCK

Functions for setting the Date, Time, and Format.

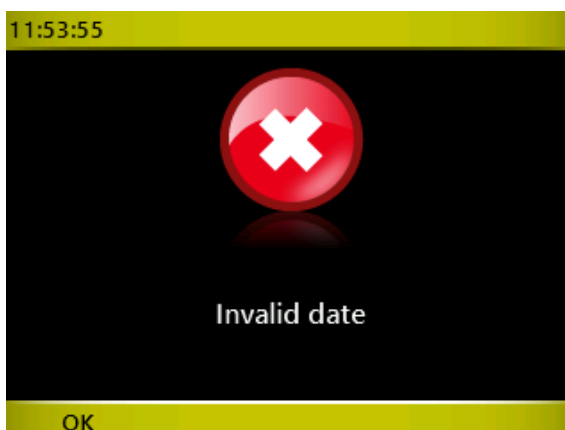


5.4.4.1 SET DATE

Enter Day, Month, and Year using the numerical keypad. Press <OK> to toggle between the fields. Press <F1> to save the data.

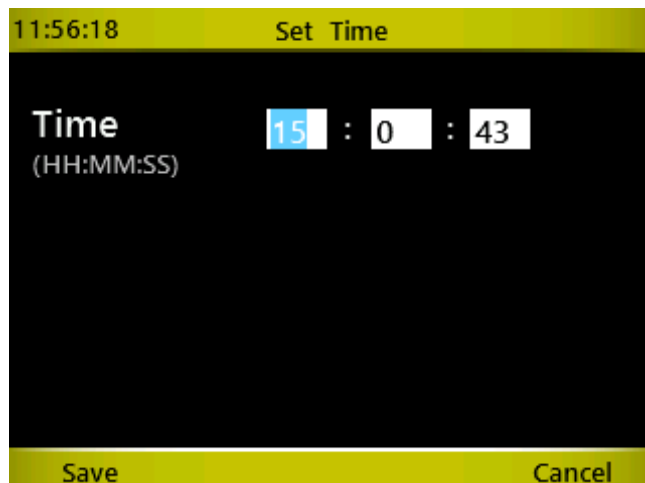


For dates containing incorrect values (e.g. day > 31 or month > 13) the user will be prompted with a relevant mask. Press <F1> to correct the invalid values.



5.4.4.2 SET TIME

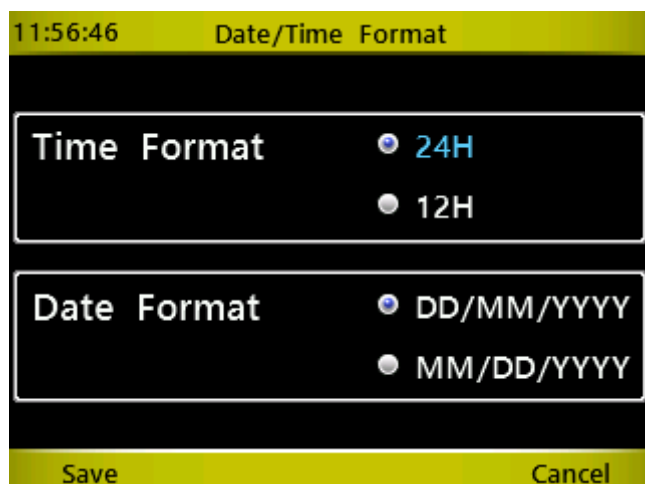
Enter Hours, Minutes, and Seconds using the numerical keypad. Press <OK> to toggle between the fields. Press <F1> to save the data.



For time containing incorrect values (e.g. hours > 24 or minutes > 60) the user will be prompted with a relevant mask. Press <F1> to correct the invalid values.

5.4.4.3 DATE/TIME FORMAT

Choose the Hour (24H/12H) and Date Format (international/American) using the <up> and <down> keys and confirm by pressing <F1> Save.



WARNING: this configuration sets only the viewing in Results. Setting of date and time on the timer, as explained in the chap. 5.4.4.1 and 5.4.4.2, is always in international format.

5.4.5 LANGUAGE

Select a language among the ones available to be used in the Witty timer user interface.



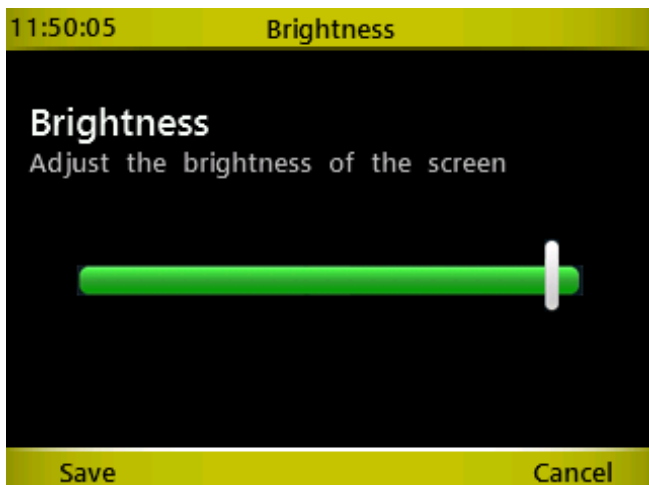
5.4.6 DISPLAY

Functions for setting the display brightness and its automatic reduction time.



5.4.6.1 BRIGHTNESS

Adjust the display brightness depending on the ambient conditions (e.g. in direct sun light it must be increased, whereas indoors it can be decreased to ensure longer battery life).



Press the right and left arrow keys to move the slider; press <F1> (Save) to confirm and exit. <F4> (Cancel) exits the function without changing the brightness configuration previously set.

5.4.6.2 SCREEN TIME-OUT

Set the time of inactivity after which the screen reduces its brightness to 5% (it is not turned off completely).



Using the up and down arrow keys choose an option and press <OK>. Press <F1> to save or <F4> to cancel.

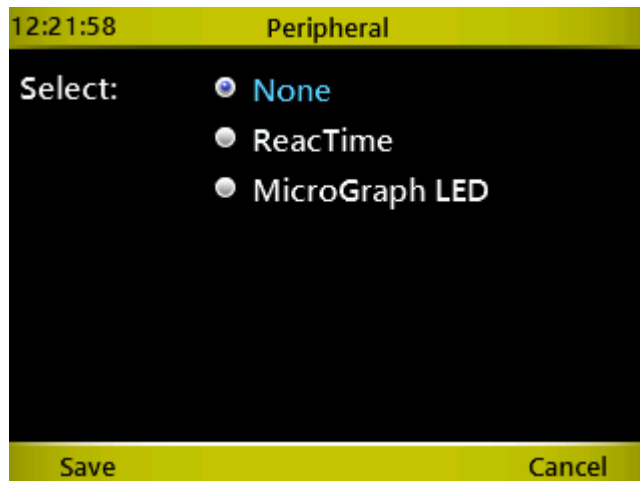
After the set time (from the last operation carried out) has elapsed, the screen reduces its brightness to 5%. To reset it, press any key.

5.4.7 PERIPHERALS

The external line input (green 3.5 mm jack on the back side of the timer) can be used to connect a series of peripherals, such as

- ReacTime by Lynx (false start and reaction times for track and field)
- MicroGraph LED display board (graphical LED display board)

If using one of these peripherals (with a specific cable), choose one and press <F1> Save.



5.4.8 WITTY-SEM

This is used to set two parameters relative to the Witty-SEM traffic lights. Select the options and press <F1> Save. The values are stored in the timer and sent to the traffic lights for each test. Therefore it is not necessary to place the traffic lights to be set in configuration mode.

The **Radio Power** parameter indicates the duration of the impulse transmission set for “Normal” mode at 1.2 sec. and for “Short” mode at 0.4 sec. (see chapter 2.3.1).

The “Proximity threshold” parameter can be set to “close”, “medium”, “distant” and indicates the approaching distance necessary to trigger the proximity sensor. As the sensor is influenced by the reflectivity of what interrupts it and by the background that surrounds it, it is not possible to indicate fixed distances for the three values that depend on ambient conditions.



6 CONNECTING TO A PC VIA *WITTY MANAGER*

Witty Manager is a PC software for MS Windows (XP Sp3, Vista, Win7, Win8) for managing the trials timed with Witty, displaying rankings, graphs, histories, etc.

The main functions are:

- managing Athletes' Personal Data including pictures and divided into groups of categories
- managing the Start Lists
- creating Customized Test definitions
- downloading data from Witty and displaying Results in highly configurable tables and graphs
- updating the Witty and photocell firmware

For all details and user instructions, please refer to the User Manual of the software.



7 TECHNICAL DATA

7.1 WITTY TIMER

Weight	337g, battery included
Dimensions	214 x 100 x 36 mm
Operating temperature	0° C/+45°C
Unit of time measurement	Selectable 1 s – 1/10 s – 1/100 s – 1/1000s Selectable speed m/s – km/h – mph - knots
Measurement resolution	4×10^{-5} s (1/25000 s)
Display	Graphic color TFT display, visible area 59x44 mm, 320x 240 pixel, with backlight adjustment via software
Radio module	Multi-Frequency Transceiver 433-434MHz
Radio transmission	Digital FSK transmission; redundant code with information correctness verification and auto-correction
Radio frequencies	433.1125 MHz to 434.7375 MHz
Radio transmission power	10 mW
Processing unit	Two 32-bit microprocessors
Time base	12 quartz 8 MHz, stability ± 10 ppm between 0°C and +45°C
Power supply	Internal polymer lithium battery, external power supply 5VDC
Battery charging	Integrated intelligent charging device
Battery life	> 10 hours
Keypad	23-key membrane keyboard • Start-Stop keys • Numerical keypad • 4 function keys • 4 arrow keys and selection key • Home key • Key for line blocking
Connections	• MICRO USB type B connector for charging and connecting to a PC • Jack connector for external input

7.2 WITTY GATE PHOTOCELL

Weight	169g, battery included
Dimensions	75 x 103 x 48 mm
Operating temperature	0° C/+45°C
Minimum resolution	0.125 ms
Delay with respect to the event	1 ms
Optical range	12 m
Radio module	Multi-Frequency Transceiver 433-434MHz
Radio transmission	Digital FSK transmission; redundant code with information correctness verification and auto-correction
Radio frequencies	433.1125 MHz to 434.7375 MHz
Radio transmission power	10 mW
Impulse transmission accuracy	±0.4 ms
Radio transmission range	Approx. 150 meters
Processing unit	16-bit microprocessor
Time base	8 MHz quartz, stability ±30ppm between 0°C and +45°C
Power supply	Internal lithium ion battery, external power supply 5VDC
Battery charging	Integrated intelligent charging device
Battery life	> 10 hours
Connections	• MICRO USB type B connector for charging and connecting to a PC • Jack connector for external input connection or double photocells.

7.3 WITTY-SEM

Weight	238g, battery included
Dimensions	83 x 103 x 68 mm
Operating temperature	0° / +45°C
Measurement resolution	4 x 10 ⁻⁵ s (1 / 25000 s)
Display	• High luminosity front matrix 5 x 7 LED RGB, visible area 42 x 60 mm • High luminosity rear lines 2 x 5 LED RGB
Sensors	• Proximity sensor • Ambient light sensor
Radio module	Multi-Frequency Transceiver 433 – 434 MHz
Radio transmission	Digital FSK transmission; redundant code with information correctness verification and auto-correction
Radio frequencies	433.1125 MHz to 434.8125 MHz
Radio transmission power	10 mW
Impulse transmission accuracy	±0.4 ms
Radio transmission range	Approx. 150 m
Processing unit	16-bit microprocessor
Time base	8 MHz quartz, stability ±10ppm between 0° and +45°C
Power Supply	Internal lithium ion polymer battery, external power supply 5VDC
Battery charging	Integrated intelligent charging device
Battery life	> 10 hours
Connections	• MICRO USB type B connector for charging and connecting to a PC • Jack connector 3.5 mm 3-pole / stereo for photocell, StartPad, button connection etc.

7.4 WITTY·RFID

Weight	169g, battery included
Dimensions	83 x 103 x 68 mm
Operating temperature	0° / +45°C
Measurement resolution	4 x 10 ⁻⁵ s (1 / 25000 s)
Display	High luminosity rear lines 5 LED RGB
Sensors	- Proximity sensor - Ambient light sensor
Rfid module	RFID Transceiver 13.56MHz (ISO 15693)
Radio module	Multi-Frequency Transceiver 433 – 434 MHz
Radio transmission	Digital FSK transmission; redundant code with information correctness verification and auto-correction
Radio frequencies	433.1125 MHz to 434.8125 MHz
Radio transmission power	10 mW
Impulse transmission accuracy	±0.4 ms
Radio transmission range	Approx. 150 m
Processing unit	16-bit microprocessor
Time base	8 MHz quartz, stability ±10ppm between 0° and +45°C
Power Supply	Internal lithium ion polymer battery, external power supply 5VDC
Battery charging	Integrated intelligent charging device
Battery life	> 10 hours
Connections	- MICRO USB type B connector for charging and connecting to a PC - Jack connector 3.5 mm 3-pole / stereo for photocell, StartPad, button connection etc.

8 DECLARATION OF CONFORMITY



DICHIARAZIONE DI CONFORMITÀ DECLARATION OF CONFORMITY

Il fabbricante
The manufacturer

MICROGATE s.r.l.
Via Stradivari, 4 - 39100 Bolzano (BZ) - Italy

DICHIARA che il prodotto
DECLARES that the product

Descrizione/Modello
Description/Model

WITTY-TIMER - WITTY-GATE - WITTY-SEM - WITTY-RFID

Destinazione d'uso: Sistema di cronometraggio per uso Training composto da Cronometro, Fotocellule,
Intended use: Timing system for Training purpose, made up of timer, gates (photocells), smart semaphore, RFID athlete recognition system with radio transmission.

è conforme alle disposizioni legislative che traspongono le seguenti direttive:

- Direttiva 2004/108 CE (Direttiva EMC) e successivi emendamenti
- FCC Rules and Regulations

is in accordance with the following Directives:

- 2004/108 EC Directive (EMC Directive) and subsequent amendments
- FCC Rules and Regulations

e che sono state applicate tutte le norme e/o specifiche tecniche di seguito indicate
and that all the following standards have been applied

EN 61326-1:2013

Apparecchi elettrici di misura, controllo e laboratorio - Prescrizioni di compatibilità elettromagnetica.
Electrical equipment for measurement, control and laboratory use - EMC requirements

EN 62479:2010

Valutazione della conformità di apparati elettrici ed elettronici di debole potenza alle restrizioni di base relative all'esposizione umana ai campi elettromagnetici (10 MHz - 300 GHz)
Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

ETSI EN 300 220-1 v.2.4.1:2012 + ETSI EN 200 -2 v.2.4.1:2012

Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW;

ETSI EN 301 489-3 V1.4.1:2002 + ETSI EN 301 489-1 V1.9.2:2011

Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services

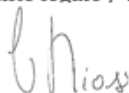
FCC Rules & Regulations, Title 47 - Part 15

DIRETTIVA 2006/95/CE DEL PARLAMENTO EUROPEO E DEL CONSIGLIO Aggiornato a dicembre 2010 del 12 dicembre 2006 concernente il ravvicinamento delle legislazioni degli Stati membri relative al materiale elettrico destinato ad essere adoperato entro taluni limiti di tensione (Bassa tensione)

DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL As of December 2010 of 12 December 2006 on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits (Low Voltage)

Bolzano, 11/05/2015

Il rappresentante legale / *The legal representative*
Vinicio Biasi



8.1 FCC CONFORMITY

The Witty·Timer, Witty·Gate, Witty·Sem and Witty·Rfid comply with the following requirements:

- FCC (Federal Communications Commission) Part 15

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC IDs:

Witty·Timer	2ADEOWIT001
Witty·Gate	2ADEOWIT002
Witty·Sem	2ADEOWIT005
Witty·Rfid	2ADEOWIT006

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The software and manuals are available in the following languages: Italian, English, German, French, Spanish.

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