SWISS TIMING

POWERTIME II

GENERAL USER'S MANUAL

3462.501.02
TIM022
Version 1.0

Index

Please refer to the last pages of this manual for a description of the different POWERTIMEII components.

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1 Introduction

The POWERTIMEII is a hand-held, battery powered timing device. The four line display, and 18 key keyboard make it very user friendly. Five plugs allow the device to be connected to various peripherals.

The POWERTIMEII reflects all the know how and experience of Swiss Timing Ltd, official timekeeper at more than 25 Olympic Games. Benefiting from the latest innovations in micro-electronic, the device more than meets the wishes of every user.

The POWERTIMEII is absolutely a futuristic device, whilst remaining very easy to use. New timekeeping programs developed to meet divers sporting disciplines may all be loaded from a personal computer.

The POWERTIMEII provides a practical solution for all disciplines requiring the measurement of time, including the time of day, the duration of a race, lap time, match time or speed.

The POWERTIMEII is characterised by its ease of use, its high precision, its compact size and low power consumption – making it suitable for every timekeeper, from amateurs to professionals, having already been used at the Olympic Games.

1.1 Safety Recommendations

To avoid all risk of electrocution, or damage to the device, never connect an external power supply directly onto the POWERTIMEII sockets; it is only permitted to connect a mains adaptor when it complies with all safety criteria.

Never use a solvent or aggressive detergent to clean your POWERTIMEII .

Never pull the paper through the printer in anything other than the direction.

Protect the POWERTIMEII from rain and water jets.

Never open the POWERTIMEII case due to risk of damaging the internal electronic circuits.

Only use the printer paper recommended by Swiss Timing Ltd. The printer uses rolls of thermal paper, 58mm wide and with a maximum diameter of 29mm.

1.2 Contents

The POWERTIMEII is delivered in a transport bag, with the system software already installed.

1.	3361.620	Transport bag
2.	3462.700	POWERTIMEII
3.	3462.606	Mini CD with standard system software
4.	9051.6042	Rolls of thermal paper (2 units)
5.		Power adaptor (option)
	3361.618	230V Europe
	3361.618.AU	230V Australia
	3361.618.GB	230V Great Britain
	3361.618.US	115V U.S.A.
6.	9035.6109	Alkaline batteries 1.5V, 1500 mAH, type AA / LR6 / UM3 (4 units)
7.	3361.605	Start & Stop connection cables (2 units) (mono jack Ø3.5mm – 2x4mm sockets)
8.	3361.603	PC connection cable (RJ 10p – RJ 10p)
9.	3361.610	PC adaptor (RJ 6p – Sub-D 9p F)

1.3 System peripherals

To carry out a totally automatic timing operation it is necessary to connect a start system and a device to detect arrivals. Any device having a volt free normally open or normally closed contact, can be used (for example start gates, start transducer, photocells, contact strips etc.)

For initial familiarisation with the device, or where high precision timing is not absolutely essential, the [START STOP] button allows direct entry of start and arrival impulses directly from the keyboard.

1.4 Keyboard: Use of the keys

[△△] **Paper Advance** key

[START STOP] **START/STOP** key: switches on the device and allows manual recording of starts and finishes.

[✎] **Correction** key: this replaces the timekeepers pencil and allows the modification of times. Any correction is printed (change of competitor number, erasing a time, manual entry of a time).

[OFF/ON] **ON/OFF** key: renders active/inactive (arming) the external channel shown by the cursor ▸.

[▲] **Cursor** keys: allow movement through the [▼] menus.

[ESC] **ESC** key: cancels a modification or exits a menu.

1.5 Switching the device on

Press and hold down the [ENTER] button until the end of the operation, during this time press the [START STOP] button briefly.

1.6 Switching the device off

Return to the main menu by pressing [ESC]; then go to the *Off* selection and press the [ENTER] key.

1.7 Navigating through the menus

The actual selection is shown on the screen by means of the character ▸. Use the cursor keys ([▲] and [▼]) to make a selection and the key [ENTER] to confirm. If a menu choice is no longer shown on the screen, the vertical arrows (↑ or ↓) on the top or bottom of the screen indicate that the screen display may be scrolled by the cursor keys.

2 Technical Specification

Data storage: even when switched off, the *POWERTIMEⅡ* saves all data. For this, it uses a capacitor mounted on the main circuit board. This guarantees that no information is lost when changing the main batteries.

Memory: the *POWERTIMEⅡ* depending on the program that is installed, allows several hundred times and heats to be stored, with a maximum of 2000 results.

Distribution of information: the serial output allows results to be transmitted to a scoreboard or PC either during, or after, races.

3 General Functions

Note:
Some *POWERTIMEⅡ* programs, not developed by Swiss Timing Ltd, may use different menus.

3.1 Type of contacts

A contact is defined by the change of state of an electric switch.

Take the case of a simple push button to explain this concept. To record an arrival signal, press the button then release it. Depending on the type of push button we have the two following possibilities:

Normally closed (NC):

Normally open (NO):
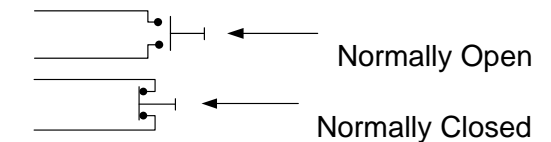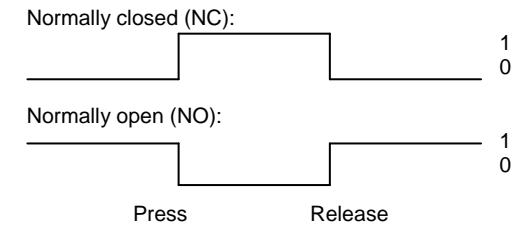
It is a fundamental feature of the device that the type of contact must be correctly interpreted: in other words will the timing pulse be recorded when the signal changes from 0 to 1 or from 1 to 0?
With regard to above diagram, it is easy to understand that if we configure the contacts incorrectly we will falsify the results by several tenths of a second. In this case the device will interpret the arrival time as the moment that the judge releases – rather than presses – the push button.

How to configure a contact:

Settings [ENTER] *Contact* [ENTER] *Start/Stop* [ENTER]
NO/NC [ENTER]

Where Start/Stop is the input you wish to configure and NO/NC defines whether the contact will be normally open or normally closed.

3.2 Synchronisation

Timing signifies precision ! If you are timing with only one **POWERTIMEII**, make sure that the date and time of day are correct. If you are timing with several devices, it is necessary to synchronise them before the competition starts, to ensure that they will all give the same result. To do this it is necessary that the « Start » of the synchronisation is the same on each device (Note: have you correctly chosen the type of contact – normally open or normally closed ? See 3.1).

How to synchronise

Settings [ENTER] *Synchro* [ENTER] *Date* [ENTER]

[ENTER]
DD-MM-YY
Day, month, year all with two characters; for example 02-03-98 for the 2nd March 1998, 01-01-00 for the 1st January 2000.

[ESC] Hour [ENTER] HH.MM:SS [ENTER]

hours, minutes, seconds, each time with 2 characters; for example 17.30:00 (use the 24 hour clock no am/pm).

The **POWERTIMEII** will now be ready and will display ?start. The internal clock will be synchronised when a start signal is given, which can be either by the [START STOP] key or the external « start » socket.

To synchronise several devices together:

- Connect all the start sockets together – remembering to respect the polarity (red plugs connected together, black plugs connected together).
- Program each device as detailed above.
- Give an external start impulse.

3.3 Arming

Arming time is a concept that increases the reliability of a timing service whilst simplifying the task of the operator. Understanding the concept of arming time and using it correctly is an important feature of high quality timekeeping.

To help understand this concept, here is an example:
Take a 1500m where the finish times are recorded by a photocell. The race is about to start: the finish channel should be disarmed. An official walks in front of the cells, and the athletes are on their first lap; none of the times are recorded. On the last lap the finish channel is armed and all times are recorded. When the last athlete has passed, disarm the channel again. The result can now be printed.

The **POWERTIMEII** allows operation in manual arming mode, this means that the operator must press the OFF/ON key before the times can be recorded, or in automatic arming mode where the time will automatically be recorded after a pre-determined arming delay of x seconds. In the first case enter 0 as the arming time, alternatively the number of seconds before automatic rearming. If you enter 10, the **POWERTIMEII** arms the arrival channel 10 seconds after the start impulse is received.

Note that all events occurring when the inputs are disarmed are still stored in the memory (stack). The operator can see these times and select them by using the modification menu accessed by the « correction » key.

How to set an arming time:

Settings [ENTER] *Contacts* [ENTER] *Arming* [ENTER] xx
[ENTER]

Where xx is the arming time in seconds, in the range from 0 to 99.

3.4 Resolution and Rounding

The rules of the different sporting federations stipulate a timing resolution and method of rounding that can vary substantially.

Several examples:

Type of race	Resolution	Rounding Type
Swimming	1/100	rounding
Athletics 100m	1/100	rounding IAAF
Athletics 20 Km walk	1/10	rounding IAAF

The **POWERTIMEII** can be used for each method of calculating a result by offering a resolution from 1/1000 of a second up to a whole second, and the following rounding methods:

- truncated (the fractional part is simply ignored)

- rounded (if the fractional part is equal or superior to 0.5, the whole part is increased by one)
- rounded IAAF (if the fractional part is more than 0.0, the whole part is increased by one)

For example, for a time measured to one thousandth of 12.128 with a precision of one tenth we will have:
- truncated: 12.1
- rounded: 12.1
- rounded IAAF: 12.2

How to configure the resolution:

Settings [ENTER] *Resolution* [ENTER]
[ENTER]
Choose required resolution [ENTER]

How to configure the rounding mode:

Settings [ENTER] *Rounding* [ENTER]
[ENTER]
Choose required rounding [ENTER]

3.5 Scoreboard and PC output

The **POWERTIMEII** allows the distribution of timing data on two separate lines – the scoreboard output and the PC output. The scoreboard output uses an RS422 protocol and the PC output uses an RS232 protocol.

The scoreboard output is defined by the data protocol used and the desired scoreboard format.
Depending on the application, different protocols will be used, which allow the **POWERTIMEII** to control scoreboards of different types (refer to specific program manuals for further details).
The menu *Settings Scoreboard* allows the selection of the type of scoreboard as well as the manner in which the data will be displayed on the scoreboard.

How to select the type of Scoreboard:

Settings [ENTER] *Scoreboard* [ENTER] *Type* [ENTER]
[ENTER]
Choose the type of scoreboard

As examples consider the RollerTime protocol scoreboard or the Multi-line protocol which enables the use of up to 8 lines of scoreboard at the same time (for example the Calypso or UNT7).

Settings `ENTER` *Scoreboard* `ENTER` *Type* `ENTER` *Multiline*
`ENTER` number of lines `ENTER`

Where the number of lines is a value between 1 and 8 corresponding to the number of scoreboard lines that are connected together.

The resolution of the scoreboard specifies which information will be transmitted. For example, consider a six digit scoreboard. If you are timing a track athletics event, the scoreboard should display minutes, seconds, tenths and hundredths (mm:ss:th). For the walk the display will be in hours, minutes, seconds and tenths (h:mm:ss:t). However, for a marathon, the display will be in hours, minutes and seconds (hh:mm:ss).

How to Configure the resolution of the scoreboard output:

Settings `ENTER` *Scoreboard* `ENTER` *Resolution* `ENTER`
Choose the resolution `ENTER`

Note that one of the resolution choices is OFF which disconnects the scoreboard output.

3.6   Printer

The *POWERTIMEII* printer is considered a vital tool in the provision of official results. All data « captured » during the event is printed in time of day; all relevant data (for example the finish time) is then processed and the *POWERTIMEII* prints the effective race time.

If printing during the event is not essential, the printer may be switched off and then reactivated at the end of the race to print the final result.

How to switch the printer ON and OFF

Settings `ENTER` *Printer* `ENTER` *ON or OFF* `ENTER`

3.7   Controlling the memory

The *POWERTIMEII* stores in its memory all the information recorded during all the timed competitions. This information will remain available until the operator decides that it is no longer required. At that point it will be necessary to clear the memory. An erase function is available to clear the data in the memory, but it should be noted that all the information will be permanently erased.

How to erase the memory

Settings `ENTER` *Erase* `ENTER` *Yes or No* `ENTER`

3.8   Corrections

Every timekeeper hopes for a trouble free event. However, in reality, it may be necessary to modify some of the data that has been automatically recorded by the device. For example, someone other than an athlete may pass through the finish line photocells. A bib number may be read incorrectly. Many other unpredictable situations can arise without warning.

In these cases, the *POWERTIMEII* has a menu that enables the operator to modify the registered data so that the final results are correct.

Note that all data modifications or manually entered start or finish times are indicated on the printer with an asterisk (*).

Use the ✏ **key to enter the « modification » mode.**

Normally, it is possible to modify or insert a start time, modify or insert a finish time, exchange times, or recover in the memory (stack) an information that was not considered as useful.

The *POWERTIMEII* stores in a special memory (the stack), all information that is not immediately required to produce a result. For example a finish time, when the arrival channel is not armed or a start time before the race has started.
Note that access to this special memory (stack) is only possible if the data has been memorised.

4   Timekeeping

4.1   Before the Race

Before the races, it is necessary to check the basic set-up information:
- The date and time
- The type of contacts being used
- The timing resolution
- The presentation of information on the scoreboard
- The printer – switched ON or OFF
- Erase the results already in the memory from previous races

4.2   For each race
- Select the timing mode: for example by lane or single finish line.
- Select or edit the event and heat number.
- Arm or disarm the external start and stop channels.
- Edit the bib numbers (unless timing in lane mode)
- Make any corrections.
- Print the results.
- Exit the race.

5 Other functions

5.1 Paper Replacement

Open the paper compartment cover.

Lift out the remaining part of the existing paper roll and carefully cut the paper leaving a piece of paper several centimetres in length, which will help to load the new roll. **Never try to pull the remaining paper through the print head with any force. This will damage the printer.**

Make a diagonal cut at the end of the new paper roll.

Whilst pressing the paper advance key, slide the end of the new roll of paper into the paper guide on the printer.

Gently push the paper forwards until the advance mechanism grips it.
Continue pressing the paper advance key until the paper is fed right through the printer. You may now – gently – pull about 10 cm of paper through the printer.

Pass the end of the paper between the main body of the device and the paper compartment cover.

Close the paper compartment cover.

❖ **Never use the printer when there is no paper, as this will damage the printer.** If it is not possible to replace the paper immediately, then switch off the printer

Settings ENTER *Printer* ENTER *OFF* ENTER .

5.2 Battery Replacement

The **POWERTIME II** works with 4 1.5 V alkaline batteries (1500 mAh, type AA / LR6 / UM3). It is also possible to use appropriate sized and rated rechargeable cells. Note that these cells cannot be recharged by the **POWERTIME II** even if the mains adaptor is connected.

The **POWERTIME II** allows you to change the batteries even when a race is in progress. However, the start and finish signals will not be registered whilst the actual battery replacement is under way. Having replaced the batteries, return to the race using the function menus.

Open the battery compartment cover.

Remove the four batteries. Do not throw these batteries into the dustbin but send them for recycling.

Insert four new batteries (never replace just some of the batteries – always four at the same time) and note the correct polarity as shown in the base of the battery compartment.

Close the battery compartment cover.

The internal Lithium battery must only be changed at a Swiss Timing Ltd service centre.

5.3 Loading new version

Different programs exist for the **POWERTIME II** (for example Standard, Ski, Top-8). You can find these on the Swiss Timing Ltd web-site (www.swisstiming.com). Here are the step by step instruction of how to load a new version, or a new program into your **POWERTIME II** :

❑ Connect your **POWERTIME II** using the delivered cable to an available serial port on your computer. Be sure that this last is not used by any other running program. Note: an equivalent USB to Serial Port can also be used.

❑ Click on the line "Update your **POWERTIME II** , the installer will be loaded and the connection will be done automatically. When the connection between the computer and the **POWERTIME II** is established a red icon with a **POWERTIME II** is shown.

❑ The corresponding serial port will be found automatically.

❑ The connection is automatic, if an error occurs it means that the connected com port is not available, not correctly installed or already used by another PC application.

❑ The installation software will show you the serial port used for the connection and the **POWERTIME II** version (1 or 2).

❑ To upload a new program set the radio button to "Software", the list of available programs is shown. Select the desired program to load and then press "Download".

❑ At the end of this process, the program asks you if you want to save changes; just answer YES.

6 Troubleshooting

- **The _POWERTIME II_ won't switch on**: check the battery condition.

- **The display flashes**: the battery voltage is too low – replace the batteries.

- **The printer doesn't work**: *c*heck that there is paper. Check that the printer is switched on (initialisation menu, printer). Note that the printer is automatically switched off if the battery voltage is low.

- **The PC connection doesn't work**: check the connection cable between the _POWERTIME II_ and the PC is connected and that the transmission protocol parameters are correctly selected (9600 Bauds, 8 data bits, 1 stop bit, no parity) and that the correct COM port is selected.

- **There is no display**: check the batteries are installed and that the polarity is correct, then press and hold the `ENTER` button until the end of the operation, during this time press the `START STOP` button briefly.

- **The external start and stop channels are not working**: check – on the display – that they armed. Test each input by creating a short circuit with a metallic object (key or nail).

- **Menu access and operation impossible:** press the RESET (located on the bottom of the device, just by the START identification) with the tip of a pen. Note: this will erase all results in the memory, and the setup process will need to be repeated. However, the date and time are not modified. The _POWERTIME II_ will display the boot program version (operating system of the _POWERTIME II_).

If the problems continue, please contact your nearest service centre.

7 Accessories and options

The following accessories are available for the _POWERTIME II_ (this list is not exhaustive):

|		
C1	3361.603	Connection cable
C2	3361.628	Dual output adaptor for SCB & PC
C3	3361.626	SCB adaptor
C4	3361.627	Adaptor for 2x SCB
C5	3361.605	Start & Stop connection cable
F1	3361.608	Extension box, 1xStart, 4x Stop or
	3361.609	Extension box, 1x Start, 8x Stop
P2	3361.610	PC adaptor (RJ 6p – Sub-D 9pF)
S1	2872.003	Pushbutton with 3m coiled cable
	3361.611	Swimming harness 1x Start, 8x Stop
	9051.6042	Printer paper (1 roll)
	9051.6042PK	Printer paper (20 rolls)
	3449.961	GEMINI, 6 digits display using 7 segment amber LED digits (24cm) or
	3449.991	GEMINI, 9 digits display using 9 segment amber LED digits (24cm)
	3456.901	Marathon clock single-sided display using 8 segment amber LED digits (16cm) See photo below. Or
	3456.902	Marathon clock double-sided display using 7 segment amber LED digits (16cm)

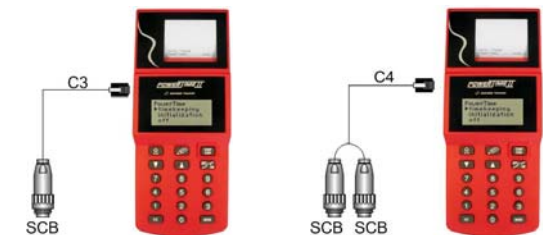|		
3399.911	StartTime III, acoustic start system 230V. See photo below.

8 Cabling diagram
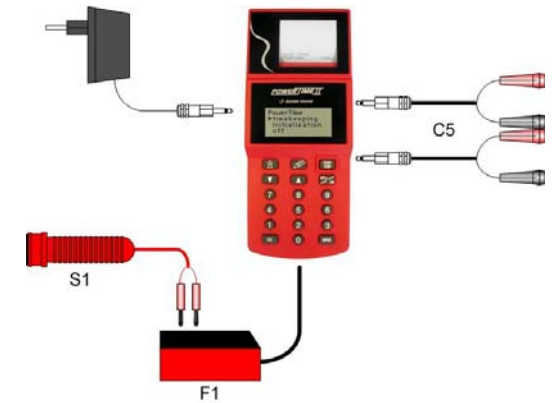
Note: To connect one of the extension boxes, you have to open the battery compartment cover.
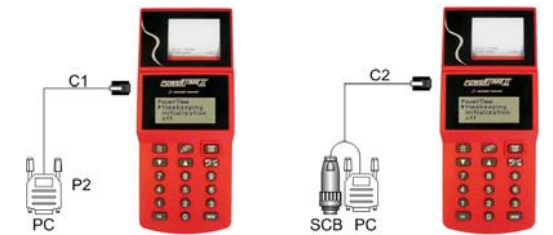
Computer connection (PC)   Scoreboard and computer connection

Scoreboard connection (SCB)   Connection of 2 scoreboards

9   Technical Characteristics

Display	LCD 4 lines of 16 alphanumeric characters
Keyboard	10 numeric keys, 8 function keys
Acoustic signal	~ 1 kHz
Printer	24 alphanumeric characters per line
Thermal paper	width 58 mm, Ø < 29 mm

Time base thermally compensated
Switched off: ± 1 ppm at 20°C; ± 10 ppm between -20°C and +40°C
Turned on: ± 1 ppm between -10°C to +50°C

Resolution	1 sec to 1/1000 s
Memory capacity	maximum 2000 competitors
External start	mono jack socket, Ø 3.5 mm
External Stop	mono jack socket Ø 3.5 mm
Extension of external sockets	10 pole RJ socket

Serial output for PC and scoreboard 6 pole RJ socket,

		RJ 12	Sub-D 9p
Scoreboard	TxD+ (out)	pin 1	pin 1
RS 485	TxD- (out)	pin 3	pin 9
	GND	pin 2	pin 5
PC	TxD (out)	pin 6	pin 3
RS 232	RxD (in)	pin 5	pin 2

9600 Bauds, 8 data bit, 1 stop bit, no parity

Internal power 4 alkaline batteries 1.5 V, 1500 mAh, type AA/LR6/ UM3

Operating time
Without serial output: >30 hours and 2000 printed lines at 20°C

With running time on PC and Scoreboard: >12 hours and 2000 printed lines at 20°C

External power power jack plug Ø 3.5 / 1.9 mm for 9 V power adaptor

+ —⊙— —

Operating temperature	-10°C to +50°C
Weight	500 g with batteries
Dimensions	210 mm x 95 mm x 40 mm

Note: if the device is turned off, the 1/1000th of a second is lost.

Mains adaptor

Mains power	230V AC 50 Hz or 115V AC 60 Hz depending on model
Output voltage	9V DC 1.2A

POWERTIME II
software CD-ROM, Windows™ compatible from 2000 up.

10   Description

These numbers refer to the drawing on the next page.
1. Paper compartment cover.
2. Paper cutter.
3. Paper compartment

4. [pencil icon] correction menu

5. START STOP manual start/stop or switch on.

6. OFF / ON arm the start and stop channels

7. ▲ up cursor.
8. Numeric keyboard.

9. ENTER validation

10. ESC escape without modification.

11. ▼ down cursor.

12. [paper advance icon] paper advance.
13. LCD screen.
15. Reset.
16. External START socket.
17. External STOP socket.
18. Battery compartment cover.
19. Battery compartment.
20. Socket for external power supply.
21. Socket for connection to PC and scoreboard.
22. Socket for extension of input channels
23. Cable route.
24. **POWERTIME II** serial number