



TAGHeuer

PROFESSIONAL TIMING

CHRONOPRINTER 545

User Manual

Version 11/2014



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1. Introduction

Building on TAG Heuer Professional Timing's legacy of evolution and innovation in timing equipment, the brand has developed a new version of our famous Chronoprinter.

The CP 545 version offers outstanding precision, reliability and simplicity to the user, with new features such as a USB connection for easier communication with all PCs, a larger internal memory and new integrated timing modes such as jumping for equestrian events.

In addition, the new CP 545 is now available with rechargeable NiMH batteries with our standard power supply.

2. The Keyboard



- ON/OFF** Power ON – Hold **ON** down for 5 seconds to turn power ON
Power OFF – Press **F** and follow the instructions on the LCD display.
- F** Menu – To enter or to exit the menu and sub-menus
- ▲** UP and DOWN keys to explore the menu and to scroll through the unassigned memorized times
▼ DOWN key to deactivate the Automatic numbering of the channels
- ◀** **ENTER** – to confirm menu selection, time, date or competitor number in the **RECALL** function.
- R** **RECALL** – to access the unassigned memorized times of a channel for identification with a competitor number. Direct times identification is also possible.
- *** **ERROR** – to cancel a wrong number you entered or to confirm an option.
Interruption of the printing.
Numbering of forerunners with ***** + N°
- 0 - 9** Numerical keyboard – to enter a time, the date, a competitor number or a distance.
- E1 – E4** To confirm a competitor number for one of the channels.
False START, INTER or FINISH and confirmation of a channel deactivation **▼** + (**E1 – E4**) or gives opportunity to enter and verify competitor bibs **▲** + (**E1 – E4**).
- 1 – 4** Manual keys for timing impulses or start the time (synchronisation)
Green
- 1 – 4** Manual keys to unblock and block the External inputs (**Input 1 – 4**).
Red Inputs are blocked wh/a black bar is shown on the LCD display —

Warning

The manual timing keys (1 to 4) do not guarantee timing precision. Only two simultaneous impulses can be processed at a time from the manual keys

3. Rear Connectors



INPUT 1 to 4

Inputs for timing impulses.

Working contacts without potential (short circuit or op/collector)

Ex: Manual contactor (HL18), photocells (HL2-31 / HL2-35), Start Gates (H7-1 / HL7-3), radio receiver (HL610, HL620 etc.)

Respect the correct polarity!

POWER

For an external power supply.

HL545-1 adaptor (110-220Vac / 12 Vdc) or 12Vdc batteries via HL520-17 connection cable.

USB

Bi-directional communication with PC.

Upgrade to the latest firmware for CP 545

Baud rate automatic

Note: The USB port is not suitable for transmitting data to LED display or modem

RS232

Bi-directional communication with a PC (ONLINE or OFF-LINE) with selectable baud rates (2400 / 4800 / 9600 Bds (default) and 32k or 56k Bds)

Upgrade of the new software for CP 545

Timing data transfer from one CP 545 to another.

With "Display Mode", this allows standard communication with **TAG Heuer** or Alge displays boards

ETHERNET

Bidirectional communication with a PC or a Network (LAN) with other CP 545, PC display board or printer.

4. Quick operation guide

The exceptional performance of Chronoprinter CP 545 is guaranteed with its simplicity of use, the hallmark of **TAG Heuer** timing philosophy

4.1. Battery installation & replacement / rechargeable NiMH battery

To op/the battery cover, use your thumbs to firmly push it in the direction of the arrow.
Insert the batteries, respecting the correct polarity, as indicated at the bottom of the compartment.

WARNING

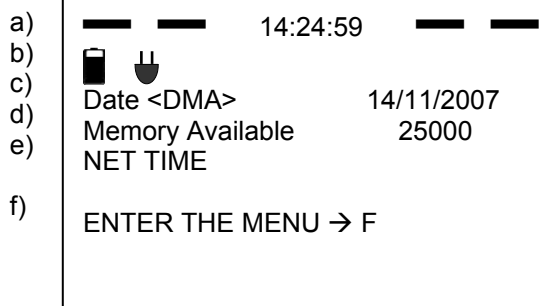
To guarantee the security of your timekeeping, it is recommended to use your CP 545 with the internal NiMH battery in a well-charged state, or with the Docking - BATT.

Always remove the batteries if you don't use your CP 545 for several days.
If you forget to do this, the batteries could leak and seriously damage the device. The warranty does not cover this problem.



The time of day, the date, the memorized runs and the selected parameters are saved by a small internal battery.

4.2. Switching the CP 545 ON and Synchronise

- 1) Press **ON** for 5 seconds
- 2) The LCD display will show



LCD Screen

- a) 4 black bars indicating that the external Inputs are blocked (1 to 4).
The time of day is memorized in the CP 545 (internal or after a **SYNCHRO**).
- b)  Symbol indicates that the power supply is connected and  the charge of NiMH batteries
- c) The date
- d) The memory available
- e) The Timing Mode used the last time
- f) How to enter the menu.

INNOVATION

The CP 545 provides a visual (on the LCD) and audio alarm if an external input remains in short-circuit. This feature allows you to observe the status of TAG Heuer's new "direct-response" photocells (HL2-31 & HL2-35 – serial number up to 7000) and allows the timekeeper to instantly determine if a photocell is out of alignment.

This audio alarm is also available with our Data & Impulse Radio transmission HL670 / HL615.

- 3) The same message is printed with the device N° (ID) and the software version, along with the timing mode and the main parameters used during your last timing session.
- 4) If the CP 545 doesn't print, enter the menu (F), select **PRINTER ON** and validate **◀↵**. You should check your batteries and replace if necessary
- 5) Synchronise the CP 545 (refer to chapter 6.3) if needed
- 6) Select a Timing Mode (refer to chapter 5.6)
- 7) Check timing parameters (precision, lock time etc) (refer to chapter 5.8)
- 8) Op/a Run (start the Timing session)
- 9) Example of how to start a new Timing session:
 - a) Enter into the menu (F)
 - b) Clear the memory.
 - c) Timing mode (you may change this if desired)
 - d) Parameter (If changes are needed – Precision, Blocking, etc.)
 - e) Synchronise (manual at Time of the Day to correspond with other systems, or time proposed by you on the CP 545, or start at 00:00)
 - f) Op/a new run (begin the timing session)

PLEASE NOTE

If the same Timing Mode is reconfirmed through this menu (Mode Chrono) sequence, the parameters by default are restored.

5. Menu description before opening up a new run

These menus are available before a Run is opened. Several menus can be found wholly or partially in the Run Menu (see chapter 21).

To navigate the menus, press **F**. To select an option use the **▼** and **▲** keys and confirm with **◀↵**.

At any time it is possible to exit menus by pressing the **F** key the number of times necessary to return to the main menu.

5.1. Power OFF CP 545

Switch OFF the device

5.2. Op/New Run

Start a new timing session after having closed the previous run.

5.3. Manual or External Synchronisation

Wh/the CP 545 is powered ON, the memorised Time of Day and Date proposed is the one used during the last timing session.

Use Synchronise Manual for a new Time of Day setting or to synchronize with other systems to a pre-set Time of Day. (Do not forget to introduce the Date)

It is also possible to synchronize the time from 00:00 (only in SPLIT and SPLIT/LAP mode) wh/a restart back to zero may be required

Master/Slave

La selection "Master/Slave" wh/we connect together via RS232, two Chronoprinter 545.

5.4. Clear Memory

Use only wh/you start a new timing session and you are sure you do not need to retain previous runs in the device's memory!

5.5. Rank a RUN of a single run,

Rank a single run or the addition of two or more runs

(Example: ranking from the addition of 3 runs)

List of runs

03 + 02 T	General ranking from the addition of run 03 and 02 T
► 03	Ranking of run 03 (added to run 02 T)
02 + 01	General ranking from the addition of runs 02 and 01
02	(calls it 02 T)
01	Ranking of run 02 (added to run 01)
	Ranking of only run 01

Or with 2 run added (ex 03 + 01). First select one of the 2 runs.

5.6. Timing Modes

PTB SEQUENTIAL 1 to 4 and 5 to 8

Sequential recording of time-of-Day on 4 or 8 channels (if 2 CP 545 are connected together with RS232 connection) directly to an external PC.
Uses bi-directional communication with a PC running **TAG Heuer** or Split Second (USSA / CLUB / NASTAR) software, where it is possible to print all net times, current ranking and ev/the competitor name and affiliation directly on the CP 545 printer.

NET TIME

Stand-Alone net timing using Start and Finish times with automatic or manual numbering. Keypad shortcuts of corrections and RECALL of memorized times for later identification or modification.
Ranking list and total time results, including if several runs occur, are added.
BIBO available in Alpine Ski mode.

NET TIME + 2 Inter

Start, with 2 intermediate times and finish time. Automatic or manual numbering. Also enables ranking and addition of runs.

PARALLEL SEQUENTIAL

Independent Start and Finish times on parallel race courses with competitor numbers.
Ranking list of single or added runs (same as with NET TIME mode).
New items: with this mode you have the possibility to set a Count Down

PARALLEL DIFFERENTIAL

Time difference at the finish on parallel race courses.
Penalty and list of runs.

START– FINISH

Stand-Alone net timing using Start and Finish times with automatic or manual numbering. Keypad shortcuts of corrections and RECALL of memorized times for later identification or modification.
This mode is similar to NET TIME mode; the difference is in the results calculation. For details, please consult point 5.2.1
Ranking list and total time results, including if several runs occur, are added.
BIBO available in Alpine Ski mode.

START – INTER – FINISH

Start, with 2 intermediate times and finish time. Automatic or manual numbering. Ranking and addition of runs.
This mode is similar as NET TIME mode. The difference is in the results calculation.
Please consult the point 5.8.1

TRAINING

Start with two intermediate and finish times (automatic numbering).
Run ranking and listing for each competitor in different runs.

SPLIT 1 to 4 and 5 to 8

Split times, partial times or lap times with competitor numbering. Ranking or listing of a competitor's lap times

SPLIT / LAP

Split Times with competitor numbering

JUMPING SPEED

Jumping mode with single phase (Count Down, Start / Finish)

JUMPING 2 PHASES

Jumping Mode with two phase (immediate Jump OFF) – Count Down, Start Phase 1, Stop Ph1 / Start Ph 2, Finish Phase 2.

JUMPING SNG PHASE (Single Phase)

Jumping Mode with two phase separate – Count Down, Start Phase 1, Stop Phase 2, Start Phase 2, Stop Phase 2)

Refer to the chapter 9 for a full description of those 3 Jumping Modes.

5.7. Jumping Parameters

5.7.1. Set Count Down

Set the count down before the start signal (30 or 45 sec). If countdown is not required you set to 0. If setting to 0 each competitor has to be validated by pressing input 3 prior manually.

5.7.2. Set Race Time Ph1

Set the Time limit for Phase 1 (sec)

If the value is set at "0", no time penalties will be added.

5.7.3. Set Race Time Ph2

Set the Time limit for Phase 2 (sec)

If the value is set at "0", no time penalties will be added.

5.7.4. Set Time P/Ph1

Set Penalty in Ph1 wh/time limit is exceeded (0.25 pts / sec)

5.7.5. Set Time P/Ph2

Set Penalty in Ph2 wh/time limit is exceeded, it is possible to set the points penalties / time (example: "0.25 pts / 1 sec" or "1.00 pts / 4 sec")

5.7.6. Set Pause Penalty

Set a default Time Penalty if pause is requested (sec)

5.8. Parameters

5.8.1. Precision

The timing PRECISION (which can be selected at start up, or assigned by default) refers to the race results

Two calculation modes are available:

«NET TIME» calculation		«REAL TIME» calculation	
Ex : with a result to 1/100 sec		Ex : with a result to 1/1000 sec	
Start Time N°121	12:34:56.136	Start Time N°121	12:34:56.136
Finish Time N°121	12:35:59.354	Finish Time N°121	12:35:59.354
Result	1:03.21	Result	1:03.218
The last digit of the calculation is truncated. The times printed will be 10x superior Here: print = 1:03.218		The print of time sure as result will be the same at 1:03.218.	

Timing Modes	
With truncation	Without truncation
NET TIMES NET TIMES + 2 INTER PARALLEL SEQUENTIAL TRAINING Results by default are 1/100 sec Selectable timing resolution from 1 sec to the 1/10'000 sec	PTB SEQUENTIAL PARALLEL DIFFERENTIAL START – FINISH START – FINISH + 2 INTER SPLIT SPLIT / LAP JUMPING (3 modes) Results by default are 1/1'000 sec Selectable timing resolution from 1 sec to 1/100'000 sec.


ATTENTION!

The RS232 and Ethernet ports always communicate the time of day to the PC with the same timing resolution as giv/on the CP 545's printer.

This avoids calculation and results errors, oft/observed if you compare the results giv/by the timing device to the software running on your PC.

5.8.2. Lock Time (multiple impulse filtering)

Lock-out time of the 4 inputs is selectable from 0.01 to 9.99 seconds.

To enter 1.00 sec, press 1 – 0 – 0 and validate with .

The minimum lock-out time of 0.01 sec should not be used with any mechanical triggering device (bounce may cause several impulses received).

ATTENTION

For your convenience, default lock times are pre-programmed for each timing mode, and can be modified by you.

5.8.3. Numbering (except PTB SEQ)

Manual or Automatic competitor numbering assigned to any of the 4 inputs.

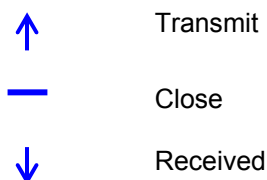
Automatic: in ascending UP order or in reference to a previous run ranking order (or BIBO)

Manual: enter the competitor's N° + (E1 – E4) normally before a timing impulse is received.

5.8.4. Inputs Status

Selection of Inputs and their timing info functions into (transmit / received) for each Input

Three statuses



The default status of the input is as follows (after switching off the CP 545)



The inputs are reported as « Transmit »

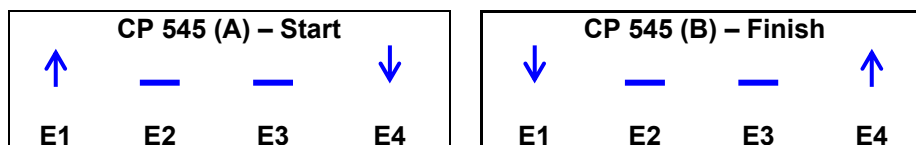
Example:

CP 545 (A) records Starting Time

CP 545 (B) records Finish Time

Download the Start time from CP 545 (A) into the CP 545 (B) for the net time calculation and from CP 545 (B) into the CP 545 (A).

Configure the Input as follows



The input's status should be specifically programmed wh/several CP 545's need to communicate together via RS 232 or with GSM Docking station.

Thus, each Chronoprinter will be able to receive recorded information at the Start and Finish point.

5.8.5. LCD Contrast

LCD scre/Backlight adjustment with ▲ plus / ▼ less, and validate with ◀ (30% is the default setting)

5.8.6. LCD Backlight

Adjusts the brightness of LCD Backlight.

100% is the default setting (with an external power supply connected)

30% is the default setting (wh/running only on internal batteries)

It is recommended to set the value at 0% during daylight conditions to guarantee the best internal battery life.

5.8.7. Lighting Off Time

Sets the time that the Backlight stays ON betwe/two impulses.

Adjust with ▲ plus / ▼ less, and validate with ◀

A shorter time ensures a better operational autonomy.

This function is not in use wh/the CP 545 is powered.

5.8.8. LCD Delay

LCD duration of the currently displayed information. Adjust with ▲ Plus / ▼ Less, th/validate ◀ (5 seconds is the default setting)

5.8.9. Beep

Audio signal activation (ON or OFF).

5.8.10. RS232 (PC)

To PC with selectable serial Port:

Baud rate is selectable: 2'400 / 9'600 / 38'400 / 57'600.

9'600 Bds is the default setting.

To Display

- Running Time on the **TAG Heuer** display (HL960 / HL 970 / HL990 / HL965 / HL980) and other display as Alge.
- Running Time of Day of the CP 545
- Blank command to the Display

Running time is the default setting

Display duration of net times is adjustable from 1 to 59 seconds using the ▲ Plus / ▼ Less arrows, th/validate with ◀⏏ (10 seconds is the default setting).

To HL960 / 990

The CP 545 now also automatically updates any of the scoreboard displays listed above.

With the HL970 it is also possible to store competitor names and numbers within the HL970 control box.

Wh/connecting the CP 545 to the HL970 you are able to display the following information.

Running time at 1/10 of second.

During the race

B	I	B		1	2	:	3	4	.	5	6				
F	I	R	S	T	-	L	A	S	T		N	A	M	E	

End of the race

R	k	:		R	N	K				T	I	M	E		
F	I	R	S	T	-	L	A	S	T		N	A	M	E	

For more information, please refer to the Matrix Display HL 970 user's manual

To HL 970 / 980

With this setting, you will have the right to display some information directly from the CP 545 to the LED Display (HL 970 or HL 980).

Running time at 1 of second.

► Net Time / Start-Finish / Training / PTB Sequential

Line 1	Running time / Net Time
Line 2	Comp #
Line 3	Speed 1 (if selected)
Line 4	Ranking

► Parallel Diff / Seq

Line 1 / 3	Comp #
Line 2 / 4	Penalty / Result

► Split

Line 1	Comp #
Line 2	Split Time
Line 3	Number of Split
Line 4	Total Split

► Jumping

Line 1	Comp #
Line 2	Running time / Net Time
Line 3	Points
Line 4	Ranking

► Time of Day

► Blank display (Blanking)

By default : Running time.

Display time : from 1 to 59 sec with adjustment ▲ Plus / ▼ Minus,
th/validate with ◀ (by default 10 sec)

► Advertising (1 to 16)

It is possible to start an advertising program (memorized into the Power Box of HL970 or into our MiniDisplay HL975, directly from CP 545

5.8.11. Ethernet

Activation ON or OFF.

Actif port : 7000, 13500, 13501, 13502 et 13503

ATTENTION

It is possible to switch ON the Ethernet Port in same time that Power ON the CP 545 but pressing simultaneously the gre/button « 4 » wh/switching ON the CP 545.

NOTE:

The Ethernet communication port has continuous power consumption, and therefore is OFF by default. It must be turned ON each time you power up the Chronoprinter.

5.8.12. Language

The CP 545 is programmed in English, French, German, Italian, Spanish and Russian.

5.8.13. Battery type

Three selections available.

No-rechargeable: standard battery type Alcalin AA, 1.2V

NiMH active Charge: to enable the charging with NiMH battery (ONLY)

NiMH disable Charge: the charging process is disable. This selection is mandatory wh/the battery type is **not** NiMH type

IMPORTANT

The charge should be not made with a temperature lower than 0°C.

It is important to select the correct type of batteries (**NiMH**) to use the internal charger circuit.

If type of battery is different than our recommended (NiMH), please disable the charging process.

No warranty will be available if users do not respect this rule.

TAG Heuer reference for NiMH battery: STHAANiMH.


5.8.14. Setting print


Prints the complete setting of the CP 545, the memory status, Timing Mode, accuracy, input status, lock time and battery level


5.9. Speed

Selectable Speed unit of measurement is m/s, **Km/h**, Miles/h and Knots. Four different speed measurements can be configured betwe/the 4 inputs.

Ex: for Speed 1 betwe/inputs 2 and 3 at a distance of 10 meters:

Start Press 2, and validate 

Stop Press3, and validate 

Distance To input the distance betwe/the photocells in millimetres:
Press 10'000 and validate .

Use  to correct any input error. Re-enter the input correctly th/validate 

When finished (for instance, if only one speed trap is to be configured) simply press **F**.

PLEASE NOTE

Speed measurements are possible in all the timing modes above, with the exception of **PARALLEL DIFFERENTIAL**, **JUMPING** (3 modes)

5.10. Printer

Printer may be ON or OFF.

To guarantee the best printing autonomy, the speed of the printer is electronically controlled based on the voltage of the batteries.

If the voltage decreases, the printing speed will slow down.

If the batteries fall below a certain voltage threshold, the printer will automatically stop. The running Time of Day on the LCD will flash.

To restore the printer, connect an external power supply and th/turn the printer ON again from the menu **F**.

If an external power supply is connected wh/you turn ON the CP 545, the printer will be automatically ON.

5.11. Download

- ▶ **To PC:** downloads all of the times memorized in one run or in all runs through the RS232 port.
- ▶ **To Printer:** reprints all times memorized in one run or in all runs.
Be sure your batteries are fresh (if not connected to the external power supply) and that there is adequate paper, especially if you will be printing many times.
Press * to stop the printing at any time.
- ▶ Download the time of a run to a PC via **USB**
- ▶ **To Chrono RS232:** to download the time from a run from a Chronoprinter to another one. It is important to set correctly the Input.

6. Menu description once Run is open

The following menus are available only wh/a Run is open

6.1. Close a Run

Before you close a run, be sure to have all possible modifications done.

6.2. Ranking

Ranking of the actual run (if only one or General Ranking of combined runs).

6.3. Rank a Run

Ranking of any memorized run or of the actual run if added with another (►).
Available for Training and Split / Lap modes

6.4. Listing

Listing of a competitor's number in a chronological order for the actual run (all the memorized times for a competitor).
Available for Training and Split / Lap modes.

6.5. List a run

Listing of a competitor's number in a chronological order of any run.

6.6. Still on Course

The competitor still on the course (net yet arrived)

6.7. Duplicate

Allows another or several competitor N°s to be associated with a particular start, intermediate or finish time already received. Same function exists for mass starts or group starts.

6.8. Insert Time

Allows you to create a particular start or finish Time of Day for any competitor.

6.9. Speed

Refer to the main menu.

6.10. Parameters

Refer to the main menu.
Depending on which Timing Mode you select, some parameters are not active.

6.11. Printer

ON or OFF. Refer to the main menu.

6.12. Merge a run

Import all times from the selected run into the new run opened.

6.13. Download

To download to PC, to Printer, to USB or to Chrono. Refer to the main menu.

WARNING

Please refer you to the chapter 6.7.4 (Inputs Status) to setup the received CP 545 from another CP 545.

7. Specificity the timing mode

7.1. Addition of runs

In **NET TIME** and **START-FINISH** mode in the opening of a new run.

Before to close a run, be sure that the results are correct. It is **not possible** to make further modifications after a run is closed.

If you want to add a previous run to the new one, select your choice in the menu List of Runs. After that, the CP 545 will ask you "Activate BIBO?" in the **NET TIME START – FINISH** Modes.

It is also possible to combine 2 runs already closed.

Select **Rank a run**, one of the run you want to add.

7.2. BIBO rule

In **NET TIME** and **START-FINISH** mode in the opening of a new run.

BIBO is a very familiar feature in Alpine Ski racing.

It refers to the establishment of a reverse running order of a certain number finishers from the results of a proceeding run. The input of a BIBO value as required. Most FIS and USSA events use "flip 30". In other words, the top 30 finishers from the first run will run in reverse order in the second run.

Ex: If you flip the 1st 30 competitors, the start order will refer to the competitor ranked from the 30th position to the 1st and th/to the 31st and up.

If **BIBO** is not activated, the starting order will refer to the ranking of the proceeding run.

PLEASE NOTE

If several competitors are ranked with the same time (tie) at the 30th position in the proceeding run, BIBO will take in account these entire competitors N°s.

If **BIBO** is not enabled, the start order of the second run will follow the ranking of the first run

8. JUMPING MODE (details)

These three modes allow you to time in Stand-Alone a Jumping Race (with or without Jump-Off) directly with our Chronoprinter 540.

With these modes, you will be able to add and remove Penalties, Stop/Restart, automatically calculate points penalties, time limit penalties (phase 1 or 2) and also automatically add Pause Penalties wh/they are required.

8.1. Input Configuration

Input 1: Start Jumping Timing

Input 2: Jump-off (only for modes "Jumping 2 Phase or Jumping Sng Phase")

Input 3: Start Count down, Pause & Restart

Input 4: Finish

8.2. (Menu: Jumping Parameters)

- Set Count Down
Set the count down before the start signal (30 or 45 sec). If countdown is not required you set to 0. If setting to 0 each competitor has to be validated by pressing input 3 prior manually.
- Set Race Time Ph1
Set the Time limit for Phase 1 (sec)
If the value is set at "0", no time penalties will be added.
- Set Time P/Ph1
Set Penalty in Ph1 wh/time limit is exceeded (0.25 pts / sec)
- Set Race Time Ph2
Set the Time limit for Phase 2 (sec)
If the value is set at "0", no time penalties will be added.
- Set Time P/Ph2
Set Penalty in Ph2 wh/time limit is exceeded It is possible to set the points penalties / time (example: "0.25 pts / 1 sec" or "1.00 pts / 4 sec")
- Set Pause Penalty
Set a default Time Penalty if pause is requested (sec)

8.3. Timing Mode: Jumping Speed

Wh/you have configured the race (Jumping Parameter) and also configured the other important parameters including Input Numbering (auto/Manual) and lock time (see CP540 user manual), you are ready to op/a new run.

The normal sequence for this Timing Mode is

- Start Count Down (Input 3) : will start the session for a new competitor
- Start Race (Input 1)
- Finish Race (Input 4).

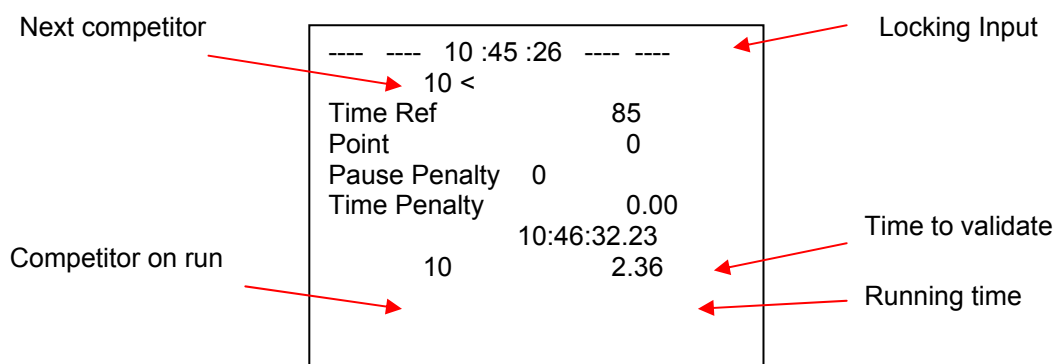
During a jumping race, the competitor will pass through the photocells several times. All these passings will be recorded and printed to the CP 540.

To validate a time, you have 5 seconds after receiving the passing time to press Enter (↵)

All times recorded are available with the function Recall for post editing.

Each competitor will be defined into the Chronoprinter as a group of times betwe/the Start Count Down (Input 3), ev/if the Count Down value is setting at "0". (from the first Input 3 – Start Count Down, to the last Input 4 – Finish)

On the LCD, you will have various information displayed during the race.



The sequence has to be respected.

- Start Count Down: (Input 3). If the countdown = 0, it will validate the competitor (from Next competitor to Competitor on Run)
- From this point, each impulse on Input 1 will be displayed on the LCD and printed. You have 5 sec to validate this time.
 - o If the time is not validated, you will be able to see it again on the function Recall ("R")
 - o If you validate the time, it is used for the next calculation.
- From this point, you are allowed to add points, remove points, and validate the next impulse on Input 4.

8.4. Mode: Jumping 2 Phase / Jumping SNG Phase

The sequence for this mode is similar as the Jumping mode

The normal sequence for this Timing Mode is

- Start Count Down (Input 3) : will start the session for a new competitor
- Start Race (Input 1)
- Jump-off (Input 2)
- Finish Race (Input 4).

The sequence has to be respected.

- Start Count Down: (Input 3). If the count down = 0, it will validate the competitor (from Next competitor to Competitor on Run)
- From this point, each impulse on Input 1 will be displayed on the LCD and printed. You have 5 sec to validate this time.
 - o If the time is not validated, you will be able to see it again on the function Recall ("R")
 - o If you validate the time, it is used for the next calculation.
- From this point, you are allowed to add points, remove points and validate the next impulse on Input 2 (Jump-Off)
- In Timing Mode: Jumping 2 Phase: you have two possibilities:
 - o The competitor received points penalties: in this case, the software will not authorize you to go further, and the ranking will be calculated.
 - o The competitor received no points penalties: the software will restart automatically the start to count up for the Phase 2, until Impulse on Input 4 is validated.
- In Timing Mode: Jumping SNG Phase:
 - o The competitor continues the second phase automatically irrespective of any time faults / penalties accrued in Phase 1.

**Do not close the run until you are sure that all data (penalties) are correct.
Once the Run is closed, you cannot make any further corrections.**

8.5. Points penalties:

You can introduce points penalties during a competitor's run, by entering the value of points (eg: 4) and validating by pressing Enter (↵)

Remove points penalties:

To remove points penalties during a competitor's run, you have to press "*" and number of points you want to remove, validating by pressing Enter (↵)

8.6. To Pause

During the race (Count down, Phase 1 or 2), it is possible to pause the running time.

An Impulse on Input 3 will pause or restart.

The Chronoprinter will ask you to confirm the Pause Time Penalty if you have set a value greater than 0.

The next impulse on Input 3 will restart the running time.

If an impulse on Input 3 is made in error, it is possible to disable this impulse by pressing "E3". Only the last impulse will be disabled.

8.7. Function Recall

The function "RECALL" will allow you to change a Start Time, Jump-Off time, or Finish Time.

Press "R" Recall, followed by the Input you need to edit (E1, E2, or E4).

The LCD will display all times from the Input you have selected.

Each time has a bib number in front to identify it.

This number cannot be not changed.

You have the possibility to select (press Enter (↵)) to validate any other times with competitors number.

After changing a competitor's time, you have to request a Ranking to recalculate the rank of all competitors.

8.8. Identify a competitor.

It is possible to re-identify a session of a competitor (ev/times which are not validated)

N° bib you want to change + "R" + New Bib Number

Example: 3 + R + 4 ↵ → all times from 3 will be re- identified as 4

If the New bib number is already used, the Chronoprinter will copy all times to a new Session of Time: 9000, 9001 etc.

Example: 3 + R + 4 ↵ → all times from 3 will be re- identified as 4

If the Session of Time is already used: all times from 4 will be re-identified as 9000

You th/have the possibility to re-identify the group 9000 with another bib number.

8.9. Disqualify / Re-qualify a competitor.

It is possible to disqualify a competitor by:

- N° + R + 0 + ↵

The "*D" will be printed in front of the time and the competitor will be completely removed from the Ranking.

The times are still identified to the competitor but the flag "*D" indicates that the competitor is "Disqualified"

Disqualify Competitor

Example: 1 + R + 0 + ↵

Re-qualify a competitor


* + N° of competitor disqualify + R + N° competitor

Example: * + 1 + R + 0 + ↵

9. Keyboard shortcuts

These important functions will help you during your timing sessions. They are similar for most of the timing modes **except PTB SEQUENTIAL**.

Pay close attention to these shortcuts and to the **RECALL** function. They allow you to act quickly in case of errors or unexpected situations.

N° + E1	To input or to change a competitor N° before a Start, or before a Start in Parallel SEQ on the blue course, or before a Finish in Parallel DIFF on the blue course.
N° + E2	To input or to change a competitor N° before the 1 st intermediate, or before a finish in Parallel SEQ on the blue course.
N° + E3	To input or to change a competitor N° before the 2 nd intermediate, or before a finish in Parallel SEQ on the red course.
N° + E4	To input or to change a competitor N° before the finish, or before the Start in Parallel SEQ on the red course, or before the finish in Parallel DIFF on the red course
* + N° + E1	Forunners numbering at the Start (time calculate but not ranked)
(E1 – E4)	To un-identify a competitor already started, passed at an intermediate point or finished (false Start, false Intermediate, false Finish). The un-identified (unassigned) times can be recalled with RECALL . (Ex: R + E4 for the finish time) for re-identification with a competitor N° or with 0 (zero) to cancel them (C).
* + (E1 – E4)	To restore the previous situation (UNDO) if one or several un-assignments were made by error.
▼ + (E1 – E4)	To disable auto numbering at Start, intermediate or finish. Start times, intermediate or finish times are memorized without competitor N°. The unassigned times can be recalled with RECALL for re-identification.
▲ + (E1 – E4)	The user has the opportunity to enter and verify or amend the competitor number before the data is transmitted to the printer / RS232 /USB and Ethernet port (Recall not possible when option activated).
R + (E1 – E4)	RECALL function to recall all memorized times that are unassigned or not identified, for identification with a competitor N° or with 0 to cancel (C).
N° + R + (E1 – E4)	Recall of a competitor N° to be modified a cancelled. The time of a competitor N° can th/be modified or unassigned. Recall the time for a new identification, or to cancel it with 0 .
▼ + R + (E1 – E4)	To disable auto numbering and direct access to RECALL for an immediate identification of the unassigned times received.
F + 	Ranking of a single run, or of the addition of two or more runs.
N° + R + 0	To abort a competitor N° (DNF) Quick action to cancel the start time of a competitor (C). Warning: The cancelled times (C) with N° + R + 0 are memorized but can't be recalled. If you made a mistake, it's necessary to insert the missing Time of Days manually (via menu)
N° + R + 0	To disqualify a competitor N° (DSQ). Quick action to cancel both the start and the finish times of a competitor Note: Normally a disqualification is the function of a race jury. However, use this function if no race jury exists and you desire to remove the athlete from the ranking due to disqualification.

IMPORTANT

The CP 545 will accept multiple times of the same competitor N° at the start and at the finish. The times tak/into account in the ranking are the last one's recorded.

With each new start or finish, the proceeding times are automatically unassigned.

It's strongly recommended to identify or to cancel these times as soon as possible. This action will simplify your timekeeping.

NOTE

This does not apply in the **TRAINING** mode, whereby several runs for a competitor can be memorised for later analysis.

It is highly recommended to identify or delete all times not identified as soon as possible.

10. Special characters memorized, printed and sent to the PC

—	Wh/a time is unassigned (false start, inter or finish)
*	Any time modified through a manipulation of start number
+	Any time inserted manually through INSERT TIME (Menu)
=	Any time repeated through DUPLICATE (Menu)
C	Any time cancelled through N° + R + 0 or after a DNF or DSQ
#	Any Start or Finish time of a forerunner (* + N°)

11. Special function: RESET CP 545

A general **RESET** can be achieved by pushing the mini switch located below the battery cover **RESET**.

For this operation use a small unfolded paper clip or a needle.

WARNING

After a **RESET, the memory is cleared and all parameters are restored.**

To achieve a **RESET**, the CP 545 batteries should have a good life or alternatively connect the external power supply. The **RESET** is available with CP 545 **ON** or **OFF**.

12. Mass Start or Group Start (GRP)

The start time could be provided by a timing impulse or at a pre-defined time

12.1. Start with a timing impulse

(The impulse is provided by a start gate, a photocell or a manual contactor on Input 1)

- Select NET TIME (menu – Timing Modes)
- Op/a New Run
- Input a competitor N° at the start (N° + E1), N°1 in our example.
- Give the start by an impulse on INPUT 1 (manual or external)
- Select Duplicate (menu)
- Input the N° to be duplicated (N°1 in our example)
- The N° and the start time are displayed
- Duplicate one or several competitor N° started at the same time as N°1
- ► **Other N°** ____ : if the competitor N° are not in chronological order (ex 2, 5, 9 etc)
- ► **N° From** ____ **to** ____ : if the competitor N° are in a chronological order (eg from 2 to 10)

WARNING

If you input a lot of competitor numbers in the same group (eg 1 to 150), it could take several seconds to proceed to the memorisation.

12.2. Start a defined time

The start(s) time(s) must be programmed in the CP 545 after you op/a New Run.

- Select **NET TIME** (menu – Timing Modes)
- Op/a New Run
- Select - **Insert Time** and **E1** (Menu)
- Input a competitor N° (eg N°1) and th/the start defined time (ex: 12:34:00.000)
- If one or more competitor numbers are starting at the same time, select Duplicate and follow the steps as described above.

WARNING

The defined start times must be referenced with the time-of-day of your CP 545 (Synchronise).

13. Changing the paper roll

It is best to change the paper roll before the existing roll is about to run out. A red border on the paper indicates that the paper is about to run out.

The change can also be carried out during the timing session (ev/in emergency wh/there is no more paper) thanks to the fact that all times are memorized while the replacement is going on. The memorized time will be printed on the new paper roll.

- ⇒ **Before the end of the paper** Enter the MENU, select **PRINTER** th/**OFF** (Printer disabled). As soon as the change is carried out, don't forget to turn the **PRINTER** back to **ON**.
- ⇒ **Wh/there is no more paper** The printer is automatically switched OFF. It will print again automatically as soon as the new paper roll is in place. All times are recorded ev/if the Printer is OFF. We recommend you check the status of your paper roll before the start of a race, and replace it with a fresh roll if it is about to run out!

Op/the paper compartment:

To op/the paper compartment, use your thumbs to slide it toward the back of the device. To slide it back into, place, put the cover flat about 3-4mm behind its closing position.

PLEASE NOTE

The paper roll is firmly supported by two lateral "half-moons" to prevent it from moving or unwinding itself.
Press * to stop printing

To remove a finished paper roll:

Pull from the centre of the paper roll backwards to extract it (as well as the paper that is still engaged in the printer).

To insert a new paper roll:

- Unroll a few centimetres of paper until its surface is clean. Cut it in a clean, perpendicular fashion.
- Put the paper roll into the cradle. Insert the paper edge under the cylindrical driver bar. Maintain a light pressure on the paper while pressing the paper feed button (↑). Make sure the paper is going in straight. Place the paper roll in its compartment and push it downwards. You will feel a click as soon as the paper roll has found its housing.

To extract a paper roll partially started:

- Rotate the paper roll to loos/a little bit of the paper.
- Extract 3 to 4 cm of paper.
- Firmly hold the unrolled paper with your index finger and thumb on each side and pull it vertically out.

14. Autonomy / Batteries

Use good quality NiMH batteries for best results.

The chart below assumes timing impulses and printing happening every 6 seconds. The CP 545 is delivered with Energizer batteries.

	0°C / (32°F)	20°C / (68°F)
Battery delivered with CP 545: Sanyo (ref TAG Heuer: STHAANiMH)	2'500 impulses	11'000 impulses

Use in low temperatures

The CP 545 is able to print on temperatures as low as -25°C!

Whenever possible, use the external power supply to extend battery life.

We recommend you consider purchasing one of the Docking Station for extended autonomy in situations wh/AC power is unavailable.

The autonomy of the Docking BATT will allow you to print 30'000 times at 20°C and at least 10'000 times at -20°C (GPS = OFF and LCD back light at 0)

WARNING

Pay attention to the autonomy of the batteries and of the paper roll if you have to print any times

It is recommended to set the back light of the LCD at 0 for a longer autonomy.

IMPORTANT

It is strongly recommended that you remove the battery if you are not using your Chronoprinter 545.

If using the Docking station « HL540-BATT ». You have the possibility to extend the autonomy.

15. Information about Timing Modes

Each Timing Mode has parameters that are memorized (default) based on those giv/during the last timing session.



CHRONOPRINTER 545
N°0003 V.A-08

DATE <DMY>
04.12.07
HOURS <HMS>
14:07:34

MEMORY FREE 26500

PTB SEQUENTIAL
PRECISION 1/1000 SEC
INPUT 1 LOCK TIME 1.00 S
INPUT 2 LOCK TIME 0.10 S
INPUT 3 LOCK TIME 0.10 S
INPUT 4 LOCK TIME 0.10 S
RS232 OUTPUT TO PC
BAUDS RATE 9600

ETHERNET OFF

Each Timing Mode proposes the main parameters memorized by default or used during the last timing session.

Example:
PTB SEQUENTIAL Mode

PTB SEQUENTIAL

- 4 active inputs with sequential numbering of time for each input

NET TIME

- Start on input 1
- Finish on input 4
- Inputs 2 and 3 are not using
- Automatic numbering on Start and Finish.
- Calculation mode **with truncation**

NET TIME + 2 INTER

- Start on input 1
- Intermediate and/or speed on Inputs 2 and 3
- Finish on input 4
- Automatic numbering on start and finish
Intermediate times with manual numbering by default
- Calculation mode **with truncation**

PARALLEL SEQUENTIAL

- Blue course start on input 1
- Blue course finish on input 2
- Red course start on input 4
- Red course finish on input 3
- Manual numbering for the start, and automatic number for the finish

PARALLEL DIFFERENTIAL

- Blue course finish on input 1
- Red course finish on input 4
- Inputs 2 and 3 are not used
- Penalty or time difference needs to be entered for each run.
- Manual numbering for finish

START – FINISH

- Start on input 1
- Finish on input 4
- Inputs 2 and 3 are not used
- Automatic numbering on start and finish.

START – INTER – FINISH

- Start on input 1
- Intermediate and/or speed on inputs 2 and 3
- Finish on input 4
- Automatic numbering on start and finish
Intermediate times with manual numbering by default

TRAINING

- Start on input 1
- 1st intermediate on input 2
- 2nd intermediate on input 3
- Finish on input 4
- Automatic numbering on start, intermediates and finish

SPLIT

- 4 active inputs with competitor numbering
- Manual numbering (by default)
- Sequential N°s for each input are sent to PC

SPLIT / LAP


- 4 active inputs with automatic (ascending) competitor N°.
- This mode allows independent timing of 4 competitors using 4 inputs.

JUMPING

- Count down on Input 3
- Start/Stop function on Input 3
- Start Phase 1 on input 1
- Start Phase 2 on input 2
- Finish on input 4
- Validation of time: **ENTER**

16. Example of Timekeeping sessions

16.1. SEQUENTIAL Mode

		
SEQUENTIAL PTB RUN N° 01		

PRECISION	1/1000	SEC
MEMORY FREE	26500	
DATE <JMA>	04.12.07	
TIME <HMS>	15:24:24	

1	1	15:24:41.334
2	1	15:24:41.817
3	1	15:24:42.293
4	1	15:24:42.801
5	1	15:24:43.620
1	2	15:24:45.420
2	2	15:24:46.060
3	2	15:24:47.500
4	2	15:24:48.250
1	3	15:24:49.405
2	3	15:24:49.887
3	3	15:24:50.878
1	4	15:24:52.054
2	4	15:24:53.647
+	6	1 15:24:44.444
Speed	1	
UNIT	Km / h	
START INPUT	02	
STOP INPUT	03	
DISTANCE	10.000 m	
7	1	15:26:21.148
5	2	15:26:21.659
4	3	15:26:22.234
Speed	1	62.582 Km/h
3	1	15:26:22.802
8	1	15:29:50.241
6	2	15:29:50.750
5	3	15:29:51.210
Speed	1	78.311 Km/h
4	4	15:29:51.720

Sequential recording of Time-of-Day, independent on each channel.


Manual time insertion on channel 1 (+)

Speed measurement setting between Input 2 and 3 with a distance of 10 metres

Speed is calculated with to a precision of 1/1'600'000 of a second !!

4 speeds are set in the PTB, NET TIME, START-FINISH, TRAINING and SPLIT mode
1 speed by course track in PARALLEL SEQ.

16.2. NET TIME Mode



NET TIME
RUN N° 01

PRECISION 1/100 SEC
MEMOIRE FREE 26500
DATE <JMA> 04.12.07
TIME <HMS> 13:33:19

	1	1	13:33:26.537
	2	1	13:33:30.453
	3	1	13:33:34.781
	5	1	13:33:48.576
	6	1	13:33:54.178
	7	1	13:33:59.239
-	7	1	13:33:59.239
C		1	13:33:59.239
	7	1	13:34:28.484
	1	4	13:34:35.927
R		<1>	1:09.39
	2	4	13:34:41.013
R		<2>	1:10.56
	3	4	13:34:49.176
R		<2>	1:14.39
	5	4	13:34:49.688
R		<2>	1:01.11
-	5	4	13:34:49.688
-	3	4	13:34:49.176
	3	4	13:34:49.149
R		<3>	1:14.39
	5	4	13:34:49.688
R		<1>	1:01.11
	6	4	13:35:28.364
	7	4	13:35:29.177
*	6	4	13:35:28.364
R		<1>	1:34.18
	7	4	13:35:26.177
R		<1>	1:00.68

← Open run 1

← N°1 Start

← (N° 5 + E1), N° 4 did not start (DNS)

← (E1) False Start for N°7
False impulse, need to be deleted R + E1 + 0

← N°7 Starts

← N°1 Finish with its actual rank

← N°3 and 5 Finish. Error !
The correct order was N°5 followed by N°3

← (E4 + E4) N°3 and N°5 False Finish
(R + E4) to re-identify times
Corrected Time of Day at the Finish (*)

← The order of the finish is unknown.
(▼ + E4) to disable the auto numbering
(R + E4) to recall memorized time to manually
associate with a competitor.

← Ranking of the 1st run

Le N°8 left.
He gives up (N°8 + R + 0)

RANKING RUN N° 01

1	7	1:00.68
2	5	1:01.11
3	1	1:09.39
4	2	1:10.56
5	3	1:14.39
6	6	1:34.18

RUN N° 01 CLOSED		
NET TIME		
MANCHE N° 02		

ADDED TO RUN N° 01		
BIBO 3		
PRECISION 1/100 SEC		
MEMORY FREE 26478		
DATE <JMA> 04.12.07		
TIME <HMS> 13:51:57		

1	1	13:52:18.269
5	1	13:52:22.364
7	1	13:52:25.857
2	1	13:52:29.403
3	1	13:52:33.771
6	1	13:52:37.836
1	4	13:52:47.658
R	<1>	29.38
G	<1>	1:38.77
5	4	13:52:54.669
R	<2>	32.30
G	<1>	1:33.41
7	4	13:53:00.509
R	<3>	34.65
G	<2>	1:35.33
2	4	13:53:05.054
R	<4>	35.65
G	<4>	1:46.21
3	4	13:53:10.807
R	<5>	37.03
G	<5>	1:51.42
6	4	13:53:16.618
R	<6>	38.78
G	<6>	2:12.96

Close run 1 (menu)

Open run 2 and append to run 1
BIBO is activated to invert the first 3 competitors of the ranking from run 1.

Start order is proposed automatically with BIBO requested

Time of run 2

Total time (General) of run 1 + 2 for the competitor N°1, and with its rank


General ranking with addition of run 1 and 2

Ranking Run 2

GENERAL RANKING
RUN N° 02+01
1 5 1:33.41
2 7 1:35.33
3 1 1:38.77
4 2 1:46.21
5 3 1:51.42
6 6 2:12.96

RANKING RUN N° 2
1 1 29.38
2 5 32.30
3 7 34.65
4 2 35.65
5 3 37.03
6 6 38.78

16.3. PARALLEL SEQUENTIAL Mode

			
PARALLELE SEQ RUN N° 02			← Open Run 1

PRECISION	1/100	SEC	
MEMORY FREE	26482		
DATE <JMA>	04.12.07		
TIME <HMS>	15:44:37		

1	1	15:44:43.585	← N°1 Starts (blue)
2	4	15:44:45.232	← N°2 Starts (red)
2	3	15:44:51.946	← N°2 Finish with its actual rank
RED	<1>	6.71	
1	2	15:44:52.228	
BLUE	<1>	8.64	← N°1 Finish with its actual rank
3	1	15:45:04.569	
4	4	15:45:04.889	
3	2	15:45:12.545	
BLUE	<1>	7.97	
4	3	15:45:12.785	
RED	<2>	7.88	
6	4	15:45:27.472	
5	1	15:45:27.996	
6	3	15:45:35.603	
RED	<3>	8.13	
5	2	15:45:37.651	
BLUE	<3>	9.65	

RANKING RUN N°01			
->	BLUE		← Blue course competitor ranking
1	3	7.97	
2	1	8.64	
3	5	9.65	
->	RED		← Red course competitor ranking
1	2	6.71	
2	4	7.88	
3	6	8.13	

RUN N° 01 CLOSED			← Close the run (menu)



PARALLEL SEQ
RUN N° 02

ADDED TO RUN N° 01

PRECISION 1/100 SEC

MEMORY FREE 26500

DATE <JMA> 04.12.07

TIME <HMS> 15:44:24

1 1 15:46:34.070

2 1 15:46:36.390

3 1 15:46:42.230

RED <1> 8.16

G <1> 16.80

2 2 15:46:42.770

BLUE <1> 6.38

G <1> 13.09

3 4 15:46:51.110

4 1 15:46:51.140

3 3 15:47:00.110

RED <2> 9.00

G <3> 16.97

4 2 15:47:00.770

BLUE <2> 9.63

G <4> 17.51

6 1 15:47:15.525

5 1 15:47:16.617

5 3 15:47:21.978

RED <1> 5.36

G <2> 15.01

6 2 15:47:23.449

RED <1> 7.92

G <1> 16.05

Open run N°2 added to run N°1

The competitor N° started on the Blue course will start on the new run in the Red course. They will be pitted against those who have made runs on the Red course. They will leave on the Blue course.

N°3 Starts on the Red course.
N°4 Starts on the Blue course.

Time of run N°2 for the competitor N°2
Total time (General) of runs 1 + 2, for the N°3 with his/her actual ranking.

General ranking with Run 1 and 2 added

Run 2 ranking

GENERAL RANKING

RUN N° 02 + 01

1 2 13.09

2 5 15.01

3 6 16.05

4 1 16.80

5 3 16.97

6 4 17.51

RANKING RUN N° 02

-> BLUE

1 3 6.38

2 6 7.92

3 4 9.63


-> RED

1 5 5.36

2 1 8.16

3 3 8.13

16.4. PARALLEL DIFFERENTIAL Mode


		
PARALLEL DIFF		
RUN N° 01		

PENALTY	2.5	
PRECISION	1/1000 SEC	
MEMORY FREE	26500	
DATE <JMA>	04.12.07	
TIME <HMS>	16:31:29	

1	1	16:31:48.864
BLUE	WIN	
2	4	16:31:49.042
RED	0.178	
4	4	16:32:06.051
RED	WIN	
3	1	16:32:06.380
BLUE	0.329	
5	1	16:32:26.940
BLUE	WIN	
6	4	16:32:32.750
RED	2.500	

RANKING RUN N° 01		
BLUE		RED
1 WIN		2 0.178
3 0.329		4 WIN
5 WIN		6 2.500

RUN N° 01 CLOSED		

		
PARALLEL DIFF		
RUN N° 02		

PENALTY	NONE	
PRECISION	1/1000 SEC	
MEMORY FREE	26491	
DATE <JMA>	04.12.07	
TIME <HMS>	16:33:15	


DIFF	1	0.000
DIFF	2	0.178
1	4	16:34:18.600
ROUGE	WIN	
2	1	16:34:19.120
BLUE	0.698	
DIFF	3	0.329
DIFF	4	0.000
3	4	16:35:25.040
RED	WIN	
4	1	16:35:29.745
BLUE	4.376	
DIFF	5	0.000
DIFF	6	2.500
5	4	16:36:22.252
RED	WIN	
6	1	16:36:24.261
BLUE	4.509	

RANKIN RUN N° 02		
BLUE		RED
2 0.698		WIN
4 4.376		WIN
6 4.509		WIN

For run 1, a PENALTY of 2.5 seconds was introduced. If a competitor does not cross the finish line, it is NECESSARY to manually allocate the arrival impulse with green button 1 or 4.
The time taken is the one of the introduced penalty:

For the run 2, WITHOUT PENALTY, the differences during run 1 will be implemented for each N° competitors. 0,000 for the winner of the 1st run and 0,698 for example, for the competitor who faces the winner on the opposite track.

16.5. TRAINING Mode

		
TRAINING		
RUN N° 01		

PRECISION	1/100	SEC
FREE MEMORY	26500	
DATE <JMA>	04.12.07	
TIME <HMS>	16:5:30	

1	1	16:53:35.120
1	2	16:53:38.190
Inter	1	3.07
1	3	16:53:40.900
Inter	2	5.78
1	4	16:53:43.585
R	<1>	8.46
5	1	16:53:54.177
5	2	16:53:56.733
Inter	1	2.55
5	3	16:53:58.721
Inter	2	4.54
5	4	16:54:03.066
R	<2>	8.88
3	1	16:54:20.168
3	2	16:54:24.854
Inter	1	4.68
C	3	16:54:20.168
C	3	16:54:24.854
1	1	16:54:49.362
1	2	16:54:53.371
Inter	1	4.00
1	3	16:54:56.710
Inter	2	7.34
1	4	16:55:00.080
R	<3>	10.71

5	1	16:55:10.740
5	2	16:55:12.720
Inter	1	1.98
5	3	16:55:15.315
Inter	2	4.57
5	4	16:55:17.332
R	<1>	6.59
1	1	16:55:31.426
1	2	16:55:35.343
Inter	1	3.91
1	3	16:55:37.296
Inter	2	5.87
1	4	16:55:39.643
R	<2>	8.21

RUN RANKING N° 01		
1	5	6.59
2	1	8.21

LISTING RUN N° 01		
COMPETITOR 1		
1	4	8.46
2	4	10.71
3	4	8.21

LISTING RUN N° 05		
COMPETITOR 5		
1	4	8.88
2	4	6.59

← Ranking of the best times made in run 1

← Times listing made by N°1 in run 1


← Listing N°5

This timing mode requires a minimal amount of manual input
N° + E1 if the competitor N° proposed on the Start is incorrect
N° + R + 0 if competitor aborts the run

Example:

N°3 starts and aborts the run after the 1st intermediate

16.6. Example: Jumping Mode



JUMPING
RUN N° 02

PRECISION 1/100 SEC
MEMORY FREE 26500
DATE <JMA> 06/04/11
TIME <HMS> 15:44:24
Count Down 30
Time Ref 1 92
Time Pen / sec 0.25

S 3 16:59:59.1
1 17:00:22:227

CountDown 6.9

* 7 1 17:00:22:227

Points: +4
4 17:01:26.528
* 7 4 17:01:26.528

.....

Competitor 1
CountDown 6.9

-- Phase 1 --

Points 4
Pause Penalty 0
Time Penalty 0.00

R <6> 64.30

Open run N°2

Information on Setting of the Race

Count down value: 30 sec

Time Ref 1: time allowed for Phase 1: 92 sec

Time Pen / sec: Time penalty / second : 0.25

Start Count Down (input 3)

Impulse on Input 1 (start Phase 1)

Value of the count down

Input 1 Validate time ("*") / competitor N° 7

Introduction of Point Penalty (4 + )

Finish phase 1 (input 4)

Input 4 validate time ("*") / competitor N° 7

Result of the Competitor

7

Value of the count down:

6.9 sec

On phase 1

Point 4 points

Pause penalty 0 sec

Time Penalty 0.00 points


Ranking

6




Net time

64.30 sec

16.7. Example Jumping – Jump-Off

			Open run N°3
JUMPING – JUMP-OFF RUN N° 03			Information on Setting of the Race Count down value: 30 sec Time Ref 1: time allowed for Phase 1: 92 sec Time Pen / sec: Time penalty / second : 0.25

PRECISION	1/100	SEC	
MEMORY FREE	26500		
DATE <JMA>	05/04/11		
TIME <HMS>	15:44:24		
Count Down	30		
Time Ref 1	92		Start Count Down (input 3) Impulse on Input 1 (start Phase 1)
Time Pen / sec	0.25		
Time Ref 2	66		
Time Pen / sec	0.25		Value of the count down Input 1 Validate time ("*") / competitor N° 5

S	3	8:49:11.3	
	1	8:49:39.575	Pause is activated (Input 3) Validation of the Pause Penalty (6 sec) Pause is ignored (Input 3)
Countdown	2.2		
*	5	1 8:49:39.575	Introduction of Point Penalty (4 + )
P+	3	8:51:00.848	Introduction of Point Penalty (8 + )
Pause Penalty:	6s		Remove Points Penalty (* + 8 + )
P-	3	8:51:13.599	
Points:	+ 4		Finish phase 1 (input 2) Input 2 validate time ("*") / Competitor N° 5
Points:	+ 8		
Points:	- 8		
	2	8:51:19.004	Result of the Competitor 5 Value of the count down: 2.2 sec
*	1	2 8:51:19.004	
.....			
Competitor	5		
Countdown	2.2		
-- Phase 1 --			
			On phase 1
			Point 4 points
			Pause penalty 6 sec
			Time Penalty 0.25 points
			Ranking 3
			Net time 64.30 sec

S	3	9:43:03.8	←	Start Count Down (input 3)	
	1	9:43:28.958		Impulse on Input 1 (start Phase 1)	
Countdown		4.8	←	Value of the count down	
*	12	1	9:43:28.958	Input 1 Validate time ("*") / competitor N° 12	
	4	9:43: 8.958			
	1	9:43:06.236			
	3	9:44:12.659	←	Impulse received on the CP 540 and not validated	
	2	9:44:32.263			
	4	9:44:51.574			
	2	9:44:57.924	←	Finish phase 1 (input 2)	
*	12	2	9:44:57.924	Input 2 validate time ("**") / competitor N°12	
.....					
Competitor	12		←	Result of the Competitor	12
Countdown	4.8			Value of the count down:	4.8 sec
-- Phase 1 --				On phase 1	
Points		0		Point	0 points
Pause Penalty	0			Pause penalty	0 sec
Time Penalty	0.00			Time Penalty	0.00 points
R	88.96			Net time	88.96 sec
.....					
	4	9:45:58.047			
*	12	4	9:45:58.047	Finish phase 1 (input 2)	
				Input 2 validate time ("**")	
.....					
Competitor	12		←	Result of the Competitor	12
Countdown	4.8			Value of the count down:	2.2 sec
-- Phase 1 --				On phase 1	
Points		0		Point	0 points
Pause Penalty	0			Pause penalty	0 sec
Time Penalty	0.00			Time Penalty	0.00 points
R	88.96			Net time	88.96 sec
-- Phase 2 --				On phase 2	
Points		0		Point	0 points
Pause Penalty	0			Pause penalty	0 sec
Time Penalty	0.00			Time Penalty	0.00 points
R	<8>	57.12		Ranking	8
.....					
				Net time	57.12 sec

17. Download a new version of Software and/or language

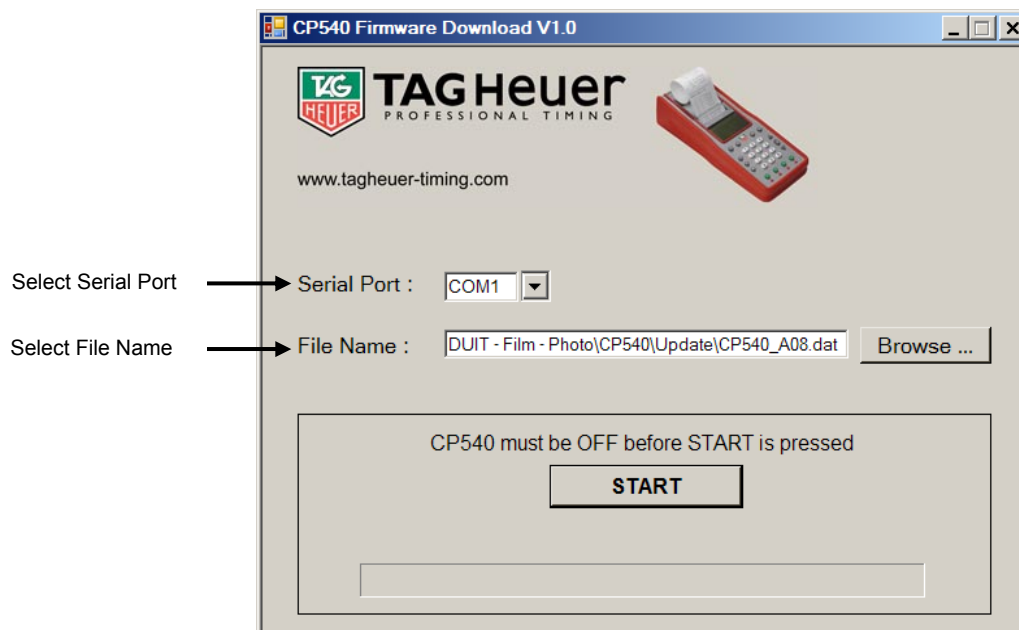
Program downloads and new releases of CP 545 software are available Free of Charge on our website www.tagheuer-timing.com

For this operation, you need to have:

- USB cable (HL545-3) or RS232 cable – (Sub-D9p/RJ11) HL545-10
- Computer
- The software «FirmwareManager.exe » upper th/version V10.

Procedure

1. Copy the software « FirmwareManager.exe » onto your hard disk
2. Power the CP 545 with an external power supply (The CP 545 is off).
3. Connect the USB or RS232 cable (HL545-10) to the PC and the CP 545
4. Run the software « FirmwareManager.exe » upper th/version VA01.



5. Select the COM Port
6. Select the file: Update (CP 545_xxx.dat)
7. Press START on the software.
8. Power ON the CP 545 (press the ON button for 5 seconds)
The CP 545 will go into a special mode « Download ».
The LDC back light will be ON, but LCD will be blank.
9. As soon as the upgrade is downloaded into the CP 545, validate the software with OK.
10. Remove the RS232 cable from the CP 545, and switch on the CP 545 again.
11. The new software version will be printed (if the Printer is in ON)

18. RS232 and Ethernet Protocol

For details of the communication protocol, please refer to the document: THCOM08.
Please contact us directly at : info@tagheuer-timing.com

19. ETHERNET LINK CONFIGURATION

- ⇒ Connect CP 545 to PC via red Ethernet cable HL545-2.
- ⇒ Configure the Ethernet configuration on your CP 545 (menu: **Parameters** → **Ethernet** → **ON**)
- ⇒ Validate the IP address, or change it if necessary (we recommend that you keep the default value at 192.168.001.050).

Note: if you are connecting several CP 545's together via Ethernet, it is imperative to set unique IP addresses for each unit.

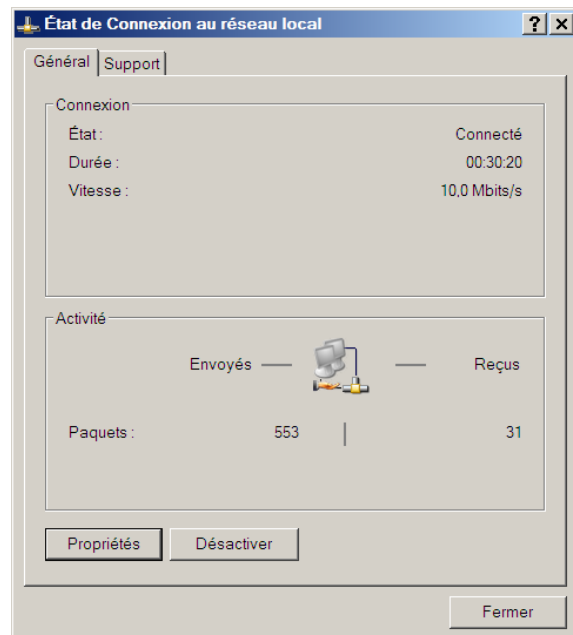
Example:

CP 545 # 1	IP: 192.168.001.50
CP 545 # 2	IP: 192.168.001.51
Etc...	

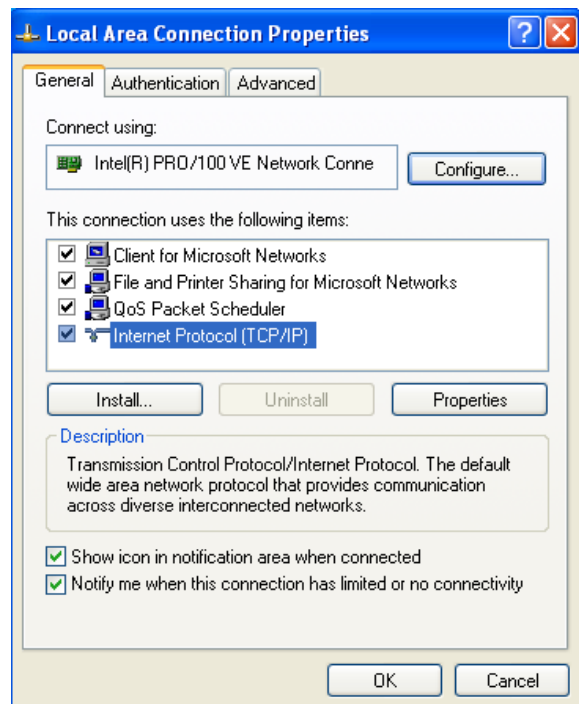
If your PC is already connected to a network server (LAN), its IP address is defined automatically. You should th/disconnect from the LAN and configure a special IP address for this application.

19.1. Configuration of your PC IP address

- Select the program **Network connection**
(**Start** → **Setting** → **Control Panel**)
We suggest that you create a short cut from your desk top to simplify the access to the LAN.
- Select **Local Area Connexion**
- Select **Properties**



- Choose **Internet Protocol TCP/IP**
- Again, select **Properties**



- Select **Use the following IP address**
- Enter the correct IP address
Example: **192.168.1.51**
The **Subnet mask** will come automatically (255.255.255.0)

Note

The IP addresses should be similar on the first 3 groups of the 3 numbers (example : **192.168.1**)

The last groups of 3 numbers should be different

Example:

CP 545 IP = 192.168.1.**50**

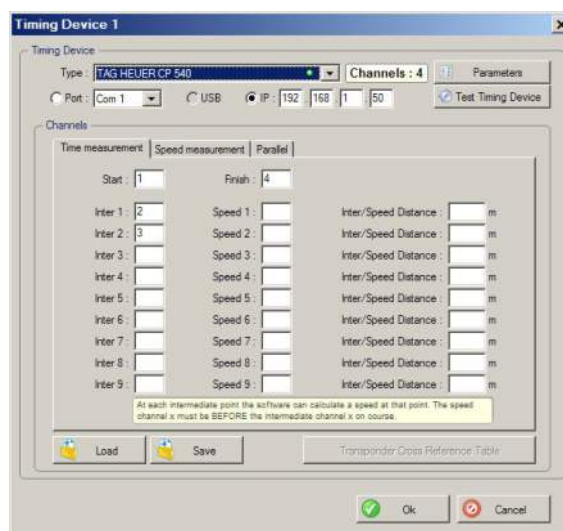
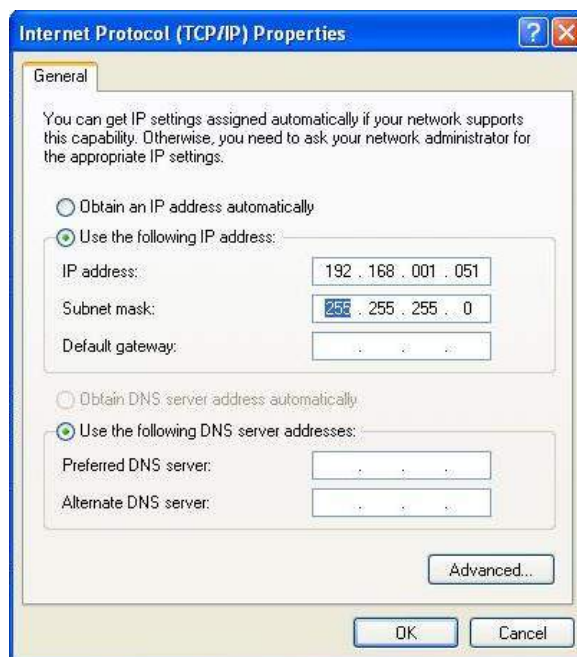
PC IP = 192.168.1.**51**

If your PC is never connected to a LAN, you can make this address permanent.

If not, to retrieve to the original setting, please select **Obtain an IP address automatically**

19.2. In SKI PRO, MSPORT PRO etc.

- Select the type of Timing Devices and enter the IP address of your CP 545.



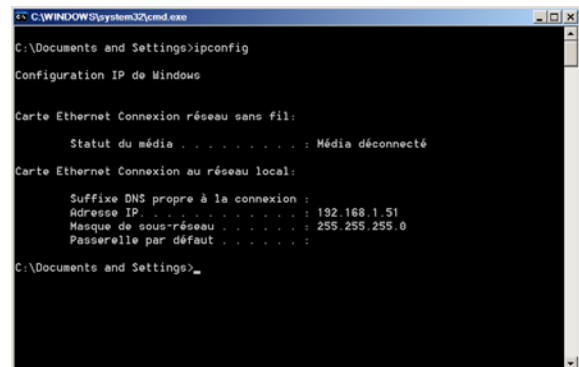
19.3. Ethernet connection test :

To test the Ethernet connection betwe/two systems

- Select: **Start → Run**
- Enter **CMD** th/validate with **OK**

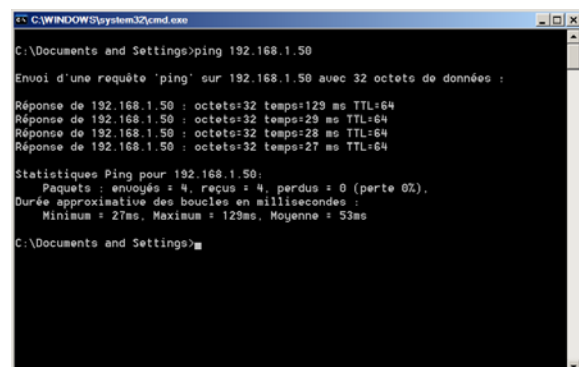


- Enter **IPCONFIG** than validate with **ENTER**
The IP address of your PC is writt/as follows:
Address IP 192.168.1.51



- Enter **PING** followed with the IP address of your CP 545

PING 192.168.1.50



- If the link is not working, please check carefully the following :
 - a) IP address of your PC
 - b) IP address of your CP 545
 - c) Connexion

20. Flow Char Main Menu

Menu	Remark	Chapter
➤ Switch OFF CP 545		5.1
Yes No		
➤ Open Run		5.2
Ready for Timing in the selected mode		
➤ Synchro		5.3
Manual External		
Master Slave AUX		
➤ Clear Memory		5.4
Yes no		
➤ Rank a Run		5.5
List of Runs		
➤ Jumping Parameters (only in jumping mode)		5.7
Count Down		
Time Ph 1		
Time Pen. Ph1		
Time Ph 2		
Time Pen. Ph2		
Pause penalties		
➤ Timing Mode		5.6
➤ PTB SEQUENTIEL 1 – 4		
➤ PTB SEQUENTIEL 5 – 8		
➤ NET TIME		
➤ NET TIME + 2 INTER		
➤ PARALLELE SEQ		
➤ PARALLELE DIFF		
➤ START – FINISH		
➤ START INTER FINISH		
➤ TRAINING		
➤ SPLIT 1 – 4		
➤ SPLIT 5 – 8		
➤ SPLITLAP		
➤ JUMPING		
➤ JUMPING 2 PHASES		
➤ JUMPING SNG PHASE		
➤ Parameters		5.8
➤ Precision		
➤ Locking Time		
➤ Numbering		
➤ Input Status		
➤ LCD Contrast		
➤ LCD Backlight		
➤ LCD Delay		
➤ LCD Time OFF		
➤ LCD Time display		
➤ Beep		
➤ RS232		➤ To PC
		➤ To HL960 990
		➤ To HL970 980
		➤ To ALGE
➤ Ethernet		Std Connexion
		User Connexion
➤ Language		French, English, Italian, German, Spanish Russian
➤ Battery Type		

	➤ Print Setting	
➤ Speed		5.9
	➤ m sec ➤ Km h ➤ Miles h ➤ Knots	
➤ Printer		5.10
	ON OFF	
➤ Download		5.11
	➤ To display	
	➤ To USB	
	➤ To PC	
	➤ To Chrono RS232	

21. Flow chart of Run Menu

Menu		Remark	Chapter
➤ Close a Run			
	Yes No		
➤ Ranking			
➤ Rank a run			
	List of runs		
➤ Listing			
	Enable in Training and SPLITLAP mode		
➤ Listing			
	Enable in Training and SPLITLAP mode		
	List of Run		
➤ Still in Run			
➤ Duplicate	Select Input E1-E4		
➤ Insert time	Select Input E1-E4		
➤ Speed			5.9
	➤ m sec	Speed 1 to 4	
	➤ Km h	Start – Input n°	
	➤ Miles h	Finish – Input n°	
	➤ Knots	Distance	
➤ Jumping Parameters (only in jumping mode)			5.7
	Count Down		
	Time Ph 1		
	Time Pen. Ph1		
	Time Ph 2	Only in Jumping 2 phases and Sng Phase	
	Time Pen. Ph2	Only in Jumping 2 phase and Sng Phase	
	Pause penalties		
➤ Parameters			5.8
	➤ Precision	1 sec 1 10 sec 1 100 sec 1 1'000 sec 1 10'000 sec 1 100'000 sec	
	➤ Locking Time	Input 1 to 4 From 0.01 to 9.99 sec	
	➤ Numbering	Input 1 to 4 Automatic Manual	
	➤ LCD Contrast	▲ plus ▼ less	
	➤ LCD Backlight	▲ plus ▼ less	
	➤ LCD Delay	▲ plus ▼ less	
	➤ LCD Time OFF	▲ plus ▼ less	
	➤ LCD Time display	▲ plus ▼ less	
	➤ Beep	ON OFF	
	➤ RS232	➤ To PC Baud Rate	
		➤ To HL960 990 Display Bodet HL970 Running Time Time of day Display OFF	
		➤ To HL970 980 Protocol THDIS08 Running Time Time of Day Display OFF Advertising 1 to 16	
		➤ To ALGE Protocol ALGE Baud Rate	
	➤ Ethernet	Std Connexion User Connexion	
	➤ Battery Type	No-Rechargeable NIMH Charge enable	

		NIMH Charge disable	
	➤ Language	French, English, Italian, German, Spanish Russian	
	➤ Print Setting		
➤ Printer			5.10
	ON OFF		
➤ Copy a Run			
➤ Add a run			
➤ Décharger			5.11
	➤ To display	Run list	
	➤ To USB		
	➤ To PC		
	➤ To Chrono RS232		

22. To opa run menu

➤ Ouverture d'une manche				
➤ PTB SEQUENTIEL				
➤ NET TIME START-FINISH	Add a run	Run list	BIBO	
➤ PARALELLE SEQ	Add a run	Run list		
➤ PARALELLE DIFF	Add a run with penalties	Run list		
➤ TRAINING				
➤ SPLIT SPLITLAP	If the time of day synchro is selected to Start at Zero, a reset time to Zero is possible anytime during a run			
➤ JUMPING				

23. Technical specifications

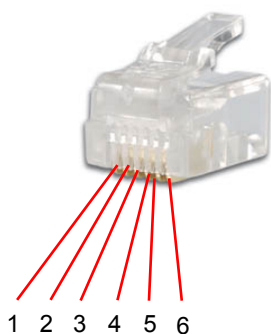
⇒ General	Stand-alone multi-sport timing system. Timing calculation (Speed) to the 11'600'000 sec. Timing resolution (printer – PC) from 1 sec to 1100'000 sec Memory of 30'000 times and 99 timing sessions Sequential N° competitor N° from 1 to 9'999
⇒ Inputs Outputs	Four banana jack inputs for external timing impulses (working contact or closing contact without potential short-circuit, opcollector) COMPUTER Bidirectional RS232 (or to drive external display) ETHERNET Expansion port for planned Docking Stations.
⇒ Keyboard	One key to turn ON the device Numerical keyboard Three keys UP , DOWN and ENTER Four validation keys (E1 – E4) RECALL key Paper feed key Four manual triggering buttons (to block and unblock) the external Inputs.
⇒ Display	Matrix LCD display with backlighting. Eight information lines with 21 characters Adjustable contrast and brightness
⇒ Printer	Continuous rapid thermal printer 24 characters per line Automatically turns off whbatteries are low, or turn off manually.
⇒ Time Base	Thermo-compensated quartz 12.8 MHz Precision: +- 0.5 ppm at 25° C Precision: +- 1.5 ppm betwe-30°C and +65°C
⇒ Operating temperature	From -20°C to + 60°C Docking Station (available late 2008) recommended for low temperature
⇒ Internal power supply	Five battery NiMH Sanyo 1.2V 2Ah (ref : STHAANiMH)
⇒ External power supply	12 V DC by adaptor (HL545-1) or 12 V batteries
⇒ Autonomy	12'000 printed times from full powered battery NiMH Sanyo
⇒ Case	Glass-filled Polyester P66 Santoprene
⇒ Dimensions Weight	270 x 100 x 65 mm CP 545 without transport case: 860g (with battery set and 1 paper roll) CP 545 with transport case and power supply: 1'800g

PLEASE NOTE

Some technical specifications could be modified or improved without any advice. This is to guarantee the evolution of our devices and accessories.

24. Pin-out

RS232



#	RJ12
1	Rxd
2	Synchro In
3	GND
4	Synchro Out
5	TxD
6	

25. Accessories

Docking Station: BATT – GPS GSMGPRS



Internal battery

- Lithium-Ion rechargeable battery which ensures the autonomous operation of the CP 545 for long-duration timing sessions even at low temperatures (-20°C)

GPS Module

- A GPS satellite module which allows you the automatic setting of the CP 545 to the exact time-of-day and the monitoring of the time-base precision relative to the GPS master during the entire timing sessions.
- An Input and Output “MasterSlave” which allows you the connection and synchronization of several CP 545's together. In this way, the same time's-of-day is guaranteed on several devices.
- A “Top-Minute” impulse output is available for synchronizing any timing devices

GSM Module

- A GSM module that gives you the possibility to transmit the timing information by wireless telephony

Docking (HL545 – BATT)

- Include an internal battery

Docking (HL545 – GSM)

This docking station is recommended for an absolute precision and professional timing and allows you to communicate between several systems in a difficult environment.

Include

- Internal battery
- GPS module
- GSM module



TAGHeuer

PROFESSIONAL TIMING

TAG Heuer
PROFESSIONAL TIMING

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