Global Solution for Rally Racing
Global Timing Solution

TAG Heuer, the leader in prestigious sports watches and chronographs since 1860, is one of the largest and fastest growing luxury Swiss brands. The Swiss brand draws upon its active engagement in the world of sports to create the most accurate timekeeping instruments in the world. From the Olympic Games in the 1920s to its role as official timekeeper to within 1/10,000th of a second for the legendary Indy 500 from 2004 to 2006, TAG Heuer, in a constant quest for innovation and precision continues to aim ever higher, as reflected by its recent partnership with ChronoRec, the well-known transponder company.

Thanks to this expertise and know-how, TAG Heuer pioneered one of the first certifications for Timing devices in the sport industry with the FIS (International Ski Federation) followed by the FEI (Fédération Internationale d’Équitation) and the FIM (Fédération Internationale de Motocyclisme). Today, complemented by the "TAG Heuer by ChronoRec" products and the brand new TAG Heuer by Lynx photo-finish camera, the range of timing devices available to the timekeeping world is unique, modular and expandable to provide "Global Timekeeping Solutions" for the most demanding sports events.

Transponder’s Technology

Originally developed for the timekeeping of radio-controlled car races during the mid-80s by pioneers sure as Pierre Rousseau from ChronoRec, automatic timing with transponders is today the precise and faster measurement of time of all racing competitions at the same time.

The system is composed of detection loops installed in the ground. Each competitor is mapped to a unique transponder, and every time this transponder passes one of the loops, their identity is mapped to a time. This system can identify, at precisely the same time on the loop, many cars or motorbikes passing the finish line in the same thousandth of a second.

Photocells’ Technology

The infra-red photocell is the older electronic timing technology. Unveiled in the mid-end of the 60s by pioneers, sure as Jack Heuer who introduced a prototype of the Slalom Timer at the Basel Watch Fair 1952. It was the company’s first quartz chronograph accurate to 1/100th of a second. In 1966, the TAG Heuer’s CEO advanced further with the introduction of the Microtimer, the world’s first miniaturized electronic timing instrument accurate to an extraordinary 1/1,000th of a second.

The Photocell’s technology is used for single-channel usages, and as back-up system to the transponders technology.

Photo-Finish’s technology

The digital timing photo-finish camera provides camera provides images, with a time precision up to 1/10,000th of a second. Developed in America in 2003, by Lynx Systems Developers, and first used by TAG Heuer for the Indy Racing league IRL championship in 2004, this technology complements and counter-verifies data from existing transponder systems.

In very close finishes, the margin of error in the times recorded by the transponder technology can exceed the margin of victory. In those situations, the ability of the TAG Heuer by Lynx cameras to take 10,000 images a second is invaluable to ensure fair and accurate results.

There are also occasions when due to damage caused by accidents or collisions, transponders cease to function or become physically detached from the vehicle. In sure situations, since it provides images and times for each competitor on every lap, the camera system can act as a back-up lap timing system.
FIA Single Stage Solution

- Chronoprinter 545
- Start Clock HL 940
- Photocells HL 2-33
- Pocket Pro Rally HL 400-R
FIA Rally Solution

- Chronoprinter 545
- Docking Station GSM
- Photocells HL 2-33
- Manual Contactor HL 18

- Start Clock HL 940
- Modulo Display HL 950
- Full Matrix Display HL 970
- Pocket Pro Rally HL400-R

**TIME CHECK ZONE**

3x HL 950 (time of day)

**SPECIAL STAGE**

HL 2-33

**START**

HL 2-33

**FINISH**

Transmission of the timing
information and Bib No. by wireless
telephony / GSM – GPRS to the
TIMING CENTER
FIA Basic Rally Stage Solution

- Pocket Pro Rally HL 400-R
- Wireless Photocells HL 1-135

www.tagheuer-timing.com
Chronoprinter
CP 545

Launched in 2008, the Chronoprinter 540 has revolutionized timing of events where photocell technology solutions are used. Multiple timekeeping modes, and a high-accuracy time base ensures reliable measurements of up to 1/100'000 second. This concentration of technology and innovation provides an intuitive solution to meet and exceed all timekeepers’ needs, from local and National events right up to and including World Championship events.

Today, capitalizing on this symbolic product of the TAG Heuer Professional Timing range, TAG Heuer have once again pushed the limits and boundaries of timing technology and launched the new Chronoprinter 545.

Building on the success of the previous CP 540 and combining all the features already present on the CP 540, TAG Heuer have concentrated timekeeping knowledge and feedback from timekeepers all over the world from many sporting disciplines to bring you additional benefits and features including:

- 3 new timing modes to complement the 10 existing modes on the Chronoprinter. They allow its use without constraints in Show Jumping race timing (single phase, immediate Jump-off, and 2 phase competition)
- Internal memory has been increased to 30'000 times: past race data all retained in memory
- Multi-language function has been integrated
- Connectivity has been expanded with the addition of a USB port
- Now accepts rechargeable batteries: the economic and ecological benefit is undeniable
- This stand-alone, multi-sport timing device is supplemented by a free version of the Elite V3 timing software

With the exception of the slight color alteration to the aesthetics, the design of the new Chronoprinter 545 retains the same cosmetic and physical characteristics as the CP540.

This new timing device remains compatible with the standard existing protocols and Docking Station accessories.

**CP 545 – TECHNICAL SPECIFICATIONS**

**General**
- Stand-alone multi-sport timing system
- Timing calculation (Speed) to the 1/1'600'000 sec.
- Timing resolution (Printer – PC) from 1 sec. to 1/100'000 sec.
- Memory of 30'000 times and 99 timing sessions
- Sequential Nr / Competitors Nr from 1 to 9.999

**Time base**
- Thermo-compensated quartz 12.8 MHz
- Precision: +/- 0.5 ppm at 25° C
- Precision: +/- 1.5 ppm between -30°C and +65°C

**Inputs / Outputs**
- Four Inputs with banana jack for Timing impulses
- COMPUTER / Bidirectional RS232 or to drive external display
- ETHERNET and USB
- Extension port for Docking

**Power supply**
- Internal: five NiMH Sanyo 1.2V / 2Ah
- External: 12 V DC by adaptor (HL540-1) or 12 V battery

**Autonomy**
- 6'000 printed times with one battery set

**Dimensions / Weight**
- 270 x 100 x 65 mm
- CP 545 without transport case: 860g. (with batteries and 1 paper roll)
- CP 545 with transport case and power supply: 1'800g.

**Display**
- Matrix LCD display with backlighting
- Eight information lines with 21 characters
- Adjustable contrast and brightness
GSM / GPRS Docking
HL540-GSM

Internal battery
- Lithium-Ion rechargeable battery which ensures the autonomous operation of the CP 540 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 540 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 “Master/Slave” which allows you the connection and synchronization of several CP 540’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

General
- Operating condition -20°C to +60°C
- External power supply 12VDC

Battery
- 7.4V Li-Po 2700mAh
- Charging condition 0° to +40°C
- Charging current 500mA (~5.5 hours)

GPS
- 12 channels, continuous tracking receiver
- Precision ±50 nanoseconds
- Current consumption when activated: 30mA
- Connector for external antenna
- Top minute output (optocoupler)
- In and Out connectors for Master/Slave operation (2xRJ13)

GSM
- Quad-band EGSM 850/900/1800/1900MHz
- Output Power
  - Class 4 [2W] @ 850 / 900MHz
  - Class 1 [1W] @ 1800 / 1900MHz
- Data transmission:
  - CDS, 9600 bds, V.92, V.110 (Modem)
  - GPRS class 10
- Standby consumption: TBD
- Average consumption in Modem mode: TBD
- Average consumption in GPRS mode: TBD
- Connector for external antenna
Start Clock
HL 940

Nothing less than the most high-performance start device ever conceived, the new HL940 TAG Heuer Start Clock represents a breakthrough in the timing world, combining an unique analogic dial and LED full colour display design to give unparalleled precision and practicality in the pure avant-garde tradition of TAG Heuer.

This new and unique architecture, inspired from the well-known TAG Heuer original start clock, the undisputed leading timing device in the rally car racing, introduces a new generation of Start devices, free of any constraint and displaying timing data and information in the most logical and elegantly way possible.

Its many innovative features include:

- GPS antenna integrated
- Outdoor LED 2 digit display for Count Down (120mm high)
- Outdoor LED in 3 colors for seconds display
- Outdoor LED in 3 colors (up to 64) for the Start Light
- Two reflective needles to show hours and minutes in classic analog fashion
- Internal high-volume horn
- Two timing modes available: Precision Time Base with sequential numbering, and Split mode with bib number.
- Up to 50 different programs for the start process
- Easily accessed side control panel
- Two input channels for external switching device (photocells, start gate or other normally-open devices
- Three bidirectional RS232 / RS485 data ports (PC / AUX 1 / AUX 2) for PC, external printer (HL 200), Display etc.
- One Input for “Start / Stop / Restart” function
- One output “Top Minute,” output impulse to synchronize with other timing devices
- One output “Top Synchro” output impulse at the precise time of start
- External plug for GPS
- External Jack plug for additional horn
- Three expansion slots for ethernet connection, GPRS, etc
- Standard communication protocol “THCOM-08”
- Compliant with all M-sports Timing Software

TECHNICAL SPECIFICATIONS

General
- An integrated GPS receiver ensures the exact synchronization to the official time-of-day at your location.
- In addition to the analogue movement, two seven-segment numeric indicators visually countdown the remaining seconds to each start interval.
- Further, another indicator comprised of a rotating red, green and yellow disk provides information on start validity.

Time Base
- 16 MHz Thermo compensated Quartz
- *+- 0,5 ppm at 68° F (20°C)
- *+- 2,5 ppm from -22° F (-30°C) to 167° F (75°C)

Temperature Range
- 77° F (-25° C) to + 167° F (75° C)

Power Supply
- Internal: 12V DC rechargeable battery
- External: 12-18V DC source

Autonomy
- 15 hours at 68° F (20° C)
- 8 hours at -90° F (-20° C)

Dimensions/Weight
- 6 kg alone (11,5 kg with transport case)
- 320 x 500 x 115 mm
- Clock face diameter: 270 mm
- Digits height: 110 mm
START CLOCK
HL 940
100mW Wireless Photocell HL3-1x

Ultra High Precision and quality electronics, high-performance lenses, lightweight and durable aluminium housing: TAG Heuer Timing’s new 100mW Wireless photocell has the best of in-house technology and heritage with over 20 years of continuous development.

Above all, the latest generation of photocells has an integrated 100mW Wireless module with a range of over 1000m, thus removing any need for cabling external devices such as the ChronoPrinter.

All the above being technical feat in itself, TAG Heuer Timing have further enhanced the photocell portfolio by integrating the Infra-red transmitter with the wireless feature to offer a complete wireless solution with a wide ranging Infra-red range operation to cater for wide finish lines up to a distance of up to 80 meters.

The HL3-1x solution is ideal for sports including motor sport, active sports, winter sports and equestrianism all demanding reliable, high accuracy, simple set up and low maintenance.

Synonymous with use for various world record attempts the TAG Heuer photocells equally find themselves at home in local competition.

Kit HL3-131
- 100mW Wireless photocells with Reflector : up to 20 m (65 ft.)

Kit HL3-135
- 100mW Wireless photocells with Infra-red Transmitter : 40 to 80 m (130 to 260 ft.)

Kit HL3-132
- 100mW Wireless double photocells with Infra-red Transmitter : 40 to 80 m (130 to 260 ft.)

Technical specifications

**General**
High frequency infra-red (32.768kHz)
Detection of signal by frequency discrimination

**Distance for use**
up to 20 meter (65 fts) with reflector (HL3-131)
up to 40 meter (130 fts) in LOW Position
up to 80 meter (260 fts) in HIGH Position Output Impulse
By optocouplers and working contact / open collector

**Working temperature**
- 20°C to + 50°C

**Interne battery**
Li-Pol 3.7V 3800mAh (+ power supply 7.5V 650mA – HL3-1)

**Autonomy Wireless Photocell**
Approximately 330 hours at 20°C

**Autonomy Infra-Red Transmitter**
LOW Position: 210 hours
HIGH Position: 100 hours

**Precision**
Fixed delay 200ms, +/- 0.5/10’000 sec (+/- 0.02 ms)

**Output Lock Time:**
Wireless ON : 200ms / Wireless OFF : 10ms

**Dimensions**
150x80x40 mm

**Weight**
800 gr

**Type of emission :**
ISM Band – 868 MHz

**Power :**
100 mW

**Rang**
1 km under optimal conditions, direct view
100mW WIRELESS PHOTOCCELL
HL3-1x family
Full Matrix Display
HL 970

The new TAG Heuer matrix LED display HL 970 will convince anyone considering multi-purpose uses with multiple parameter settings.
The concept proposed by TAG Heuer enables the visual representation of timing information or alternatively advertising and information messages (logo & text).
The unique structural concept and modularity offers the potential to create a large structure scoreboard.
The almost seamless design of each display allows displaying many types of logo without distortion.
The ideal dimensions and weight ensure simple transportation and set up.
A small external unit integrates the main electronics and power supply converter.
The matrix LED display together with the purpose designed and unique Software « Easy Display » provides a large user definable and flexible array of displays complimented by the ability for advertising – messages (logo & text).

Technical Specifications

Dimension : 1580 x 290 x 80 mm (matrix 96 x 16 pixels) 5.18" x 0.95" x 0.26"
Weight : 11kg
Control Box : 250 x 200 x 100 mm (0.82x0.65x0.32")
Communication : RS232 – RS485
Integrated power supply : 110 – 220 VAC / 12 VDC
Power consumption max : 50W
Visibility : 50 m – 164" (with characters 110mm high)
80 m – 262" (with characters 220mm high)

Example: 4x HL 970
Dimension: 318 x 53 cm

Timing Configuration
1 Line with 16 characters, high 22 cm (8.66")
2 lines with 32 characters, high 11 cm (4.33")

Timing Configuration
4 lines with 32 characters, high 11 cm (4.33")
FULL MATRIX DISPLAY
HL 970
MODULO DISPLAY
HL950

This new LED display developed by TAG Heuer Timing is the definitive solution to every timing requests for displays and scoreboards.

- Thanks to its modular concept, it is possible to select up to 8 different sizes of digits, and to design your own display display configurations, with white or coloured digits, accordingly to your needs.
- Its low weight and its limited size make all logistic concerns easier for every users
- Its competitive price offers a definitive good value for money
- Its variable brightness is ideal for any environment both outdoors in direct sunlight, and indoors in any lighting conditions.

The communication protocol used is the standard TAG Heuer Timing structure and requires no software modification.

Accessories

- HL950-USB: Modulo connection – PC via USB
- HL950-RS232: Modulo connection – PC via RS232 cable
- HL950-T: Support Tripod for 2 Modulo’s
- HL960-12: Power supply 12V
- HL975-A: Accu pack 12V

Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Size:</td>
<td>340 x 340 x 52.5mm</td>
</tr>
<tr>
<td>Weight</td>
<td>3.2 kg</td>
</tr>
<tr>
<td>Led / matrix</td>
<td>32 x 32 / White</td>
</tr>
<tr>
<td>Pixel</td>
<td>10 mm</td>
</tr>
<tr>
<td>Connection</td>
<td>RS485 / RS232</td>
</tr>
<tr>
<td>Power</td>
<td>8 to 36 Vdc</td>
</tr>
<tr>
<td>Current Nominal</td>
<td>3A at 12 Vdc (40% Leds ON)</td>
</tr>
<tr>
<td>Max</td>
<td>8A at 12 Vdc (100% Leds ON)</td>
</tr>
<tr>
<td>Size of Modulo characters</td>
<td>½ digits, high - 440 mm / 17.32”</td>
</tr>
<tr>
<td></td>
<td>1 x1 digits, high - 280 mm / 11”</td>
</tr>
<tr>
<td></td>
<td>1 x 2 digits, high - 190 mm / 7.48”</td>
</tr>
<tr>
<td></td>
<td>2 x 2 digits, high - 130 mm / 5.12”</td>
</tr>
<tr>
<td></td>
<td>2 x 3 digits, high - 130 mm / 5.12”</td>
</tr>
<tr>
<td></td>
<td>3 x 3 digits, high - 80 mm / 3.15”</td>
</tr>
<tr>
<td></td>
<td>3 x 4 digits, high - 80 mm / 3.15”</td>
</tr>
<tr>
<td></td>
<td>4 x 4 digits, high - 60 mm / 2.36”</td>
</tr>
</tbody>
</table>

Communication protocol  | THDIS08 |
Frame structure          | STX NLXXXXXXXLF |
Special link connection   | RS485 / Power Supply |
Special PC connection     | RS232 + Power |
Fixation                 | M8 on Top and bottom |
|                         | M8 on rear |
Option                   | Colours plexi – multiple colours available |
Special production        | With other type of LED colour (Red / Green / Yellow) |
Max Modulo connected     | 6x for Power Supply |
|                         | 16x for Data RS485 |
Operating conditions      | External / Internal |
|                         | Water resistant (IP42) |
POCKET PRO
RALLY
HL 400-R

The Pocket Pro Rally App, Pocket Pro HL400-R, gives users access to timekeeping functions dedicated to the timing of rally.

Three Rally-specific modes offer the possibility to manage various Rally timing requirements including schedule starts with intervals and count-down for the start marshal, time check for the co-driver indicating time to next start, target time, split times and difference. Also included is a mode for stage timing with count-down timer, stage times with splits.

All times are memorised and can be recalled and visualised for each competitor.

In addition to the three exclusive timing modes dedicated to the timing of motor sports / race tracks, this 1/100th second handheld timepiece also encompasses standard stopwatch modes, including Split / Lap time measurement, countdown, and memorising of the time of the day.

Together with its integrated USB connector; free POCKET MANAGER application and Pocket-Pro 800 measurements internal memory, the device makes the downloading, analysis, printing and archiving of results extremely simple.

• **Timing Mode**
  
  • Time Of Day (Time)
  • Count Down
  • Split / LAP
  • Start Marshal
  • Time Check
  • Stage Timer

**Technical specification**

- **Power**: 5 VCD
- **Internal battery**: 600mAh / 3.7V
- **Autonomy**: 35 days (in function)
- **Shell**: Aluminium – PVD surface treatment
- **Weight**: 160 g
- **Precision**: +/- 2 sec / month
- **Calibration available**: LCD 3 lines of 6 characters
- **Battery level / Timing Mode**
- **Size of characters**: 7mm height
- **Accuracy**: 1/100 seconds
- **Memory**: 800 stored times
- **Temperature range**: -20°C to +60°C