



TAG Heuer

PROFESSIONAL TIMING

HL 670 Data / Impulse Transmitter set

User Manual

Version 07/2010



1. Global

The Set HL670 is ideal for transferring Timing Data and Impulses.

Its 500mW emitting power and its licence free frequency range (869 Mhz) makes this device a powerful and simple to use system.

- Data / Impulse transmission system (500 Mw) which does not require a licence (free of use) in Europe (ISM Band 869 MHz – **REC 70-03**).
- Each **Receiver** can receive Impulses (simultaneously or not) from 4 **Transmitters** identified by the function "**CHANNEL**" (1 to 4).
- Up to 4 Teams can work (train) in the same area without disturbing each other thanks to the function "**TEAM**" which offers the possibility to code each system (A, B, C, D).
It is also possible to use up to 16 **transmitters** with 4 **receivers**.
- When the **receiver** is switched on, it is possible that one or more green LED's are on before that the **transmitter(s)** start to transmit. This detection system allows visualization of the quality of the received signal, but also the possible interferences coming from other radio transmission systems. If it is not possible to stop these interferences by moving the **receiver**, the transmission of Impulse cannot be guaranteed.

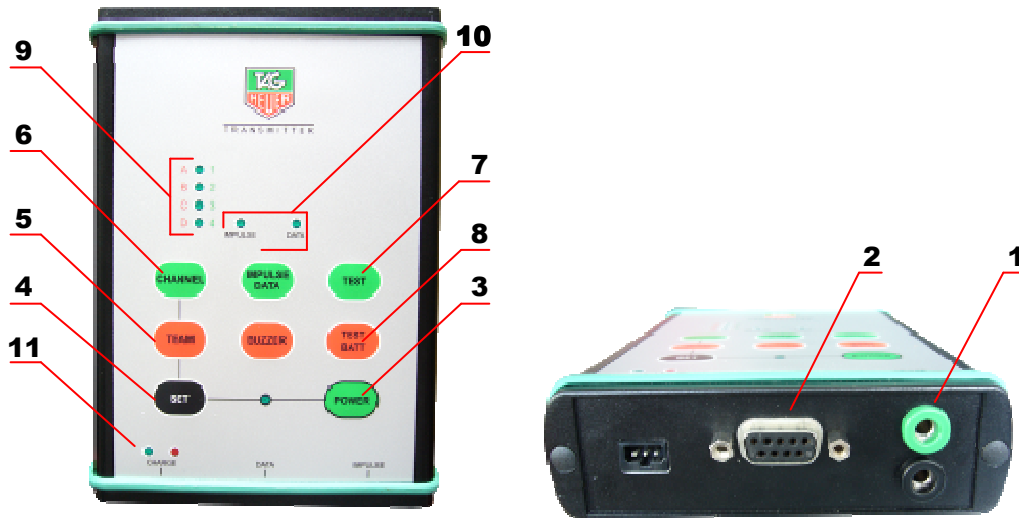
Important Remark

Don't forget to register your product online at:

<http://www.tagheuer-timing.com/tools/product-register>

1. Functions

➤ The Transmitter :



1. **IMPULSE** Input for timing Impulse (Start gate, photocell – working / closing contact). Respect the polarities.
2. **DATA** Male Sub-D 9: RS232 input for **DATA** transfer
3. **POWER** To switch on the **receiver** (press for 3 seconds on **POWER**). The green LED is on.
To switch off the **receiver**, hold down **SET** and press **POWER**.
4. **SET** To program the **TEAM** (A, B, C, D) and to switch off the **receiver**. Hold down **SET** during the changes.
5. **TEAM** To check the programmed **TEAM**.
To change the code, hold down **SET** and press **TEAM**.
6. **CHANNEL** To check the programmed **CHANNEL**.
To change the **CHANNEL**, hold down **SET** and press **CHANNEL**.
7. **TEST** For testing the Impulse transmission only. The reception level will be displayed for 0.2 seconds on the receiver. You'll also get an Impulse on the programmed output.
8. **TEST BATT** To check the state of the battery. Press **TEST BATT** : The Battery level will be displayed with the 4 LED's for 2 seconds.
9. **LED** LED control panel which shows the programmed **TEAM** or **CHANNEL**. Also shows the transmitted Impulse.
10. **LED** Shows the transmission mode : **IMPULSE** or **DATA**
11. **CHARGE** Charging status Leds. The red led indicates that the Accu is charging. The charge is completed as soon as the green LED in on.

➤ The Receiver



1. **IMPULSE** Output for timing Impulse (Start gate, photocell – working / closing contact). Respect the polarities.
2. **DATA** Female Sub-D 9 : RS232 Output
3. **POWER** To switch on the receiver (press for 3 seconds on POWER). The green LED is on. To switch off the receiver, hold down SET and press POWER.
4. **SET** To program the TEAM (A, B, C, D) and to switch off the receiver. Hold down SET during the changes.
5. **TEAM** To check the programmed TEAM. The green LED corresponding to the code A, B, C or D is on. To change the code, hold down SET and press TEAM.
6. **LED** LED control panel which shows the programmed TEAM or CHANNEL. Also shows the Received Impulse.
7. **LED** Shows the transmission mode : **IMPULSE** or **DATA**
8. **LED** LED control panel which shows the Receiving Level and/or possible interferences created by other radio signals.
9. **BUZZER** To enable or disable the Buzzer
10. **TEST BATT** To check the Battery status. The Level will be displayed with the 4 LED's for 4 seconds:
 - 4 LED's on = 80-100%
 - 3 LED's on = 60-80%
 - 2 LED's on = 40-60%
 - 1 LED on = 20-40%
 - 1 LED on = 0-20% power remaining

2. Battery Charging

Each device has a Lithium-Polymer battery with supply 2100 mAh. Those batteries may be charged with our charger HL540-10 or other 12V charger with a minimum of 800 mA.

For charging the battery we advise you to use our OEM TAG Heuer charger

Using another model may cause some trouble or harm the device.

- For charging, turn off the system.
- Connect the charger on the mains
- Plug the charger into the device
- The red LED will be on during the charge

IMPORTANT :

Always charge the devices by temperature above 32 °F (0 °C) and below 86 °F (30 °C)

The red LED lights during the charging process, when fully charged, the red LED shuts down and the green LED will light on.

For a fully charged Battery it may take approx. 5 hours (for a completely discharged battery)

Never connect the terminals of the battery in short-circuit.

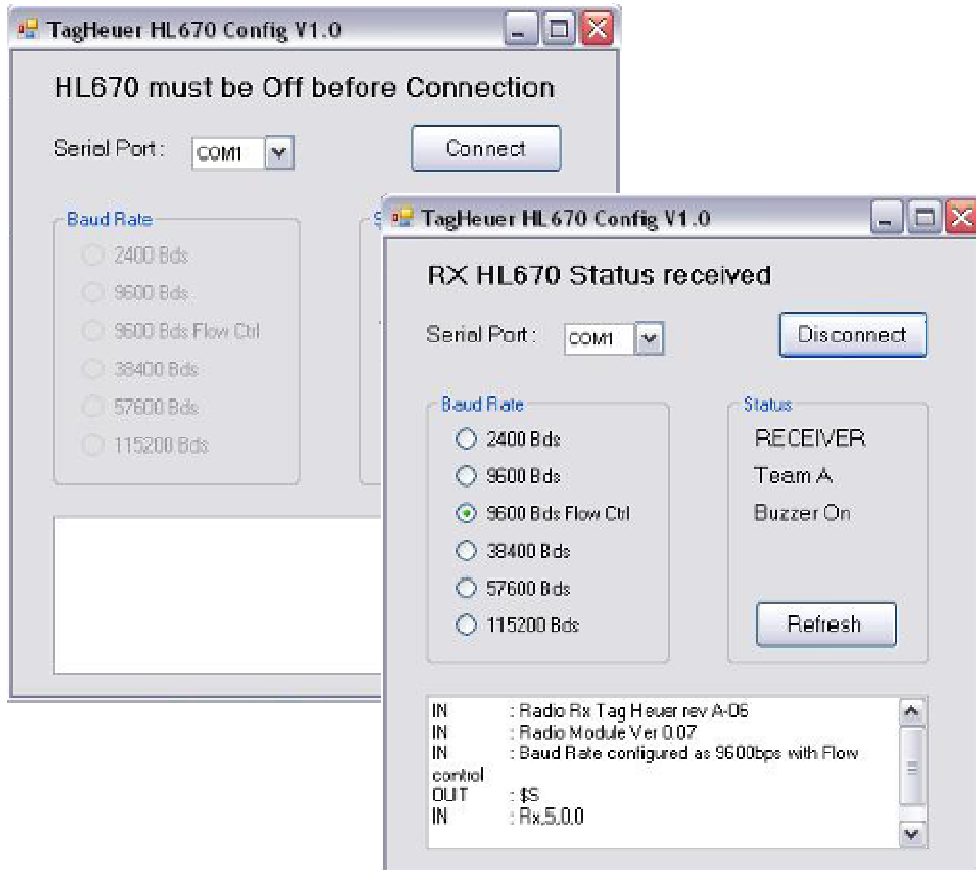
To avoid keeping the battery pack fully loaded or completely discharged for a long period, which reduces the lifespan of the battery. In the case of prolonged non-utilization of the battery pack, it is necessary keep the system in a dry room, after a normal discharge

In case of a reduced capacity of the battery pack, even after the load, leave the system ON a whole night to obtain a complete discharge, then recharge the battery pack completely.

Renew the battery pack if the problem continues.

3. System utility : TAG Heuer HL670 Configuration

Connect your device with the HL605-10 (delivered with the set) to your computer, run the application. Turn on the system **after** pressing “Connect”.



This application is a free download from our Website : www.tagheuer-timing.com, It enables you to configure the radio in different Baudrates:

2400, 9600 (Set by default), 38400, 57600, 115200 and 9600 bps with Flow control.

4. Software Update

With the Firmware (already used with the Chronoprinter 540 and the Minitimer HL440) able you to change the transmission mode and Update your device.

For this application you need :

- The RS232 cable (HL605-10)
- A computer fitted with a D-Sub9 RS232 Output
- The software « Firmware.exe »

How to proceed

1. With the radio switched « OFF » connect the external power Connect the RS232 between your computer and the HL670
2. Run «Firmware.exe »
3. Select the correct COM Port
4. Browse and select the correct file (Rx/Tx)
5. Push START on the screen
6. Turn on the HL670 (hold down for 5 seconds « ON »
The HL670 will enter in a special setup mode
7. Until the file downloaded then, validate with « OK »

For each device, transmitter or receiver, two Software options are available :

- **TAG Heuer Software** (TH_Tx_Vxx / TH_Rx_Vxx)
This software is especially dedicated for the standard CP540 protocol and the Minitimer. The 9600 with flow control Baud rate ensure that the frames are correctly transmitted.
- **Chronolec Software** (or transparent mode) (THbC_Tx_Vxx / THbC_Rx_Vxx)
This mode is especially for devices which need a data transmission with different frame length. The data transfer is made until the device receives a blank message within 50ms with a maximum frame length of 127 characters.

The transmission for 43 octets (standard CP540 frame) takes 125ms with 9600 bps.
The timeline is composed

- **35ms** for the RF transmission. This time does not depend on the baud rate just on the number of octets.
- **45ms** for sending the frame
- **45ms** for receiving the frame on the receiver

We can reduce this transmission time by increasing the baud rate from the receiver and/or the transmitter. For example, the same frame length with 115200 bps (on both sides) will only take 42ms.

Those devices may be used in a "Relay" configuration by plugging directly the Receiver on another Transmitter (through the banana socket or RS232 connection).

Hands on: Reinitialize your devices

If the systems are in a unknown mode, you can Initialise your system in the OEM configuration (**Channel 1, Team A, Buzzer On, Baud Speed 9600bps, Mode Impulse**). Push simultaneously SET and TEST BATT for 3 seconds. All LED's will flash and the system will beep until it is reinitialized.

5. Pinout

Transmitter (male socket)

- 1 NC
- 2 Radio RxD (RS232)
- 3 Radio TxD (RS232)
- 4 RS485 Signal B
- 5 GND
- 6 NC
- 7 RS485 Signal A
- 8 NC
- 9 NC

Receiver (female socket)

- 1 RS485 Signal A
- 2 Radio TxD (RS232)
- 3 Radio RxD (RS232)
- 4 NC
- 5 GND
- 6 NC
- 7 NC
- 8 NC
- 9 RS485 SIGNAL B

6. Technical Specification

General

- Impulse response precision: +/- 1/100'000 sec
- Transmitting delay: 200ms
- Frequency : 869 MHz **REC 70-03**
- Power 500 mW
- Autonomy (at +68°F / 20°C) 24 hours (1 Impulse per min.)
8 hours (THbC data transm.)
1 data string each 4 sec.

- Impedance : 50 Ohms
- Antenna 1/4 Wavelength 2.5dBi
- Impulse Input Short-Circuit / Working contact
Respect the polarity

- Impulse Output 4 separated outputs
Isolated by an opto-coupler
Manages up to 4 simultaneous inputs

- Channel : 4 different channels (1,2,3,4)
- TEAM function : 4 different codings (A,B,C,D)
- Normal use temperature between - 4°F (-20°C) and +131°F (+55°C)
- Charging temperature between +32°F (0°C) and +86°F (+30°C)
- Size (without antenna) 152 x 108 x 34 mm
- Weight : 470g / radio
- Power supply : 12 V DC / 800 mA min

Lithium-Polymer Battery

- Type 12V Li-Pol 2000mAh
- Charging current 800mA minimum (~ 5 hours)

Charger HL540-10

- Primary 230V - 50Hz - 125mA
- Secondary 12V – 1250 mA



CAUTION :

Never power up the device during the RS232 or RS484 data transfer. Powering the device during data transfer may cause the radio to freeze for which the device will require a complete initialisation.

Connection protocol for TAG Heuer by Chronolec devices :

- Connect all devices together (all should be turned off)
- Turn on the Radio (Rx and Tx)
- Turn on the Elite decoder and wait 4 to 5 seconds for the power on self test to complete.
- Turn on the Distant decoder
- Wait until the Elite decoder discovers the Distant decoder (the BXX led will flash twice)
- Finally you can start the Elite Decoder

Warranty :



One year after delivery of your purchase

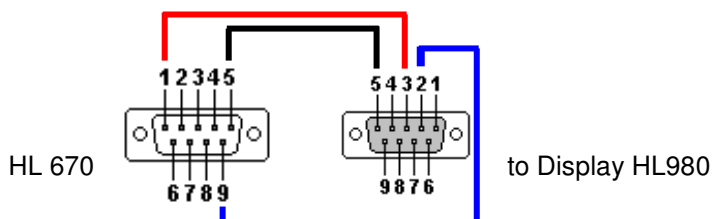
The warranty is null and void under the following conditions:

- if the battery is out of order
- Poor maintenance and obvious physical damage
- Input or Outputs damaged by poor connection
- If the device was opened without factory authorization

THE INSTALLATION INCLUDES:

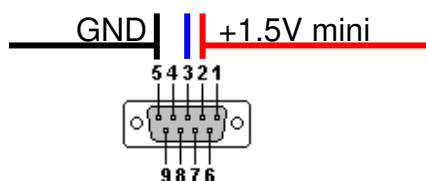
- 1 Plastic case which can store up to 5 Devices
- 1 to 4 **Transmitters**
- 1 **Receiver**
- 2 to 5 antennas
- 1 Charger 100-240 VAC / 9VDC
- 1 User manual
- 1 Velcro strap per transmitter

Special pinout for Displays HL 980 and HL 960 / 990



Special Pinout for TX activating

Our radios are equipped with a PNP Transistor on their output. This is an IT Standard which also allows us to ensure good autonomy. Some devices only work with an RX pin and Ground. In order to activate this transistor and initiate the external data from the radio you need to energise the Transistor with an external power supply or a charged condenser.



TAG Heuer by Chronolec Pinout (Distant Decoder to Elite)

	SubD9 (HL670)	SubD15 (Decoder)
Receiver	1 (RS485 signal A)	6 + 14
SubD9 female	9 (RS485 signal B)	15
Transmitter	7 (RS485 signal A)	6 + 14
SubD9 male	4 (RS485 signal B)	15



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