



PROFESSIONAL TIMING

HL920

Data Protocol

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1. Table des matières

1.	Table des matières	2
2.	Functioning modes	3
3.	RS 232 Protocol	3
4.	Frame definition	4
	Disk control frames	4
	Countdown control frames	5
	Accoustic signal control frames	6
	GMT gap control frames	7
	Parameters saving frame	8
	Times upload frame	9

2. Functioning modes

The HL920 start clock functiones in 2 particularly different modes :

- manual and RS232 mode (with or without remote control)
- GPS mode (satellite reception)

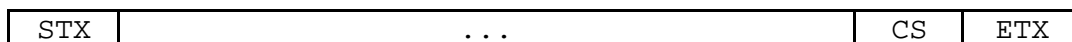
The manual/RS 232 mode allows for activating, interrupting and modifying interval times between starts, with help of the buttons underneath the clock. It also allows for programming the options of the FLASH memory. The countdown, accoustic signals, management of the rotating colour disk as well as GMT times can be programmed in this mode. These parameters can be saved for use of the start clock without having a PC connected.

In GPS mode, the clock always sends its frames to the RS 232 PC output. However, the RS 232 input is entirely deconnected, serving to reception of GPS.

3. RS 232 Protocol

Frame formats

The frame format is identical to the one used for the PTB605. Each command frame starts with a start caracter (STX) and ends with a CheckSum and a frame finish caracter (ETX).



As for the PTB605, the CheckSum is the modulo 256 sum of bytes between STX and CS.

Frame types

There are 5 different frame types :

- disk control frames
- countdown control frames
- accoustic signal control frames
- GMT gap control frames
- parameters saving frame
- times upload frame

All these frames are described, in detail, in the next chapter.

4. Frame definition

Disk control frames

These frames allow for selecting the time before ideal start time, during which the colour disk should be yellow or green, and time after ideal start time, after which the colour disk should become red again.

Control frame format to configure disk yellow :

STX	'D'	'Y'	s	s	CS	ETX
-----	-----	-----	---	---	----	-----

STX = 0x02 frame start
'D' = 0x44 disk control command
'Y' = 0x59 disk yellow
 ss = ASCII second before ideal start time (00 - 59)
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Control frame format to configure disk green and yellow :

STX	'D'	x	s	s	CS	ETX
-----	-----	---	---	---	----	-----

STX = 0x02 frame start
'D' = 0x44 disk control command
 x = ASCII 'G' disk green
 ASCII 'R' disk red
 ss = ASCII second before ideal start time (green) or after ideal start time (red) (00 - 59)
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Return from HL920 to PC without transmission error :

ACK

ACK = 0x06 OK command

Note

Seconds can be comprised between 0 and 59. Any value beyond these limits can cause malfunctioning of the start clock.

For disk yellow and green, the introduced time is the time during which the disk will show the selected colour **before** the ideal start time.

For disk red, the introduced time is time after which the disk will switch to red, **after** the ideal start time.

A time of 0 seconds for disk yellow stands for deactivating disk yellow.

Countdown control frames

This frame allows for configuring time to count down before ideal start time.

Control frame format to configure time to count down :

STX	'T'	'C'	s	s	CS	ETX
-----	-----	-----	---	---	----	-----

STX = 0x02 frame start
'T' = 0x54 time command
'C' = 0x43 countdown command
ss = ASCII seconds to count down (00 - 99)
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Return from HL920 to PC without transmission error :

ACK

ACK = 0x06 OK command

Note

Seconds can be comprised between 0 and 59. Any value beyond these limits can cause malfunctioning of the start clock.

A time of 0 seconds for countdown stands for deactivating countdown.

Accoustic signal control frames

These frames allow for configuring the functioning of the accoustic signal. The gap between the first beep and the ideal start time, as well as the gap between the continuous beeps and the ideal start time the are programmable.

Control frame format to configure single beep :

STX	'B'	'S'	s	s	CS	ETX
-----	-----	-----	---	---	----	-----

STX = 0x02 frame start
'B' = 0x42 accoustic beep command
'S' = 0x53 single beep command
ss = ASCII seconds before ideal start time for single beep
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Control frame format to configure continuous beeps :

STX	'B'	'C'	s	s	CS	ETX
-----	-----	-----	---	---	----	-----

STX = 0x02 frame start
'B' = 0x42 accoustic beep command
'C' = 0x43 continuous beeps command
ss = ASCII seconds before ideal start time for continuous beeps
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Return from HL920 to PC without transmission error (in both cases) :

ACK

ACK = 0x06 OK command

Note

Seconds can be comprised between 0 and 59. Any value beyond these limits can cause malfunctioning of the start clock.

A time of 0 seconds for accoustic signal stands for deactivating accoustic signal.

GMT gap control frames

These frames allow for choosing the time zone you are in. This function is used in GPS mode only. In fact, in GPS mode, the time received from the satellites is GMT time. In order to know the time in a certain place, this GMT needs to be corrected.

Control frame format to configure GMT gap :

STX	'T'	'G'	s	s	CS	ETX
-----	-----	-----	---	---	----	-----

STX = 0x02 frame start
'T' = 0x54 time command
'G' = 0x47 GPS time
ss = ASCII GMT correction time (00-12, 51-62)
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Return from HL920 to PC without transmission error :

ACK

ACK = 0x06 OK command

Note

Minus or plus sign are not used. For a positive correction (f. ex. GMT +1), just enter 01 as a value. For a negative correction (f. ex. GMT -3), enter 53 as a value. You need to consider the number 50 as a minus sign indication. 53 means 3 hours negative.

Parameters saving frame

This frame allows for saving all parameters in the memory of the HL920.

Control frame format to save parameters to clock :

STX	'P'	'S'	CS	ETX
-----	-----	-----	----	-----

STX = 0x02 frame start
'P' = 0x50 parameters command
'S' = 0x53 save command
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Return from HL920 to PC without transmission error :

ACK

ACK = 0x06 OK command

Note

This command saves all following parameters :

- disk green time
- disk yellow time
- disk red time
- countdown time
- single beep time
- continuous beeps time
- GMT gap time

Times upload frame

This frame allows for upload of all registered times to a PC.

Control frame format to save parameters to clock :

STX	'U'	'S'	CS	ETX
-----	-----	-----	----	-----

STX = 0x02 frame start
'U' = 0x50 upload command
'S' = 0x53 start times command
CS = SUM checksum, modulo 256 sum of bytes between STX and CS
ETX = 0x03 frame finish

Return from HL920 to PC without transmission error :

All registered times of the memory of the start clock are sent to the PC serial port in standard format.

Note

This command is also activated by pressing "minutes +" or "minutes –" underneath the clock. In this way, times can be reprinted on a printer connected to the start clock (PTB Printer).

Warning, this button allows for reprinting all times as long as the clock remains synchronised. As soon as it is stopped and turned on again, times cannot be downloaded by pressing the minutes button anymore (because this button now is needed for putting synchronisation time-of-day). In this case, times can still be downloaded, **as long as the clock is not re-synchronised!**

Once re-synchronised, all times in the memory of the clock are erased.