Protocole MS300 Pocket Pro

Spécifications de communication

Baud rate :	38400bps
Data :	8 bits
Parity :	None
Stopbit :	1 bit
Flow control :	None

1 Protocole détaillé

1.1 Description des messages

Acknolwedge of a received command (AK):

```
<S>AK_X<E>

X = ‘C’ accepted, ‘F’ rejected, 'R' not supported
```

Download start marker (DS):

```
<S>DS_RR_AAA_XXXXXXXXXXXXXXXXXXX<E>

R = Run number (always 01)
A = Number of time in memory (1 – 800)
X = Name of the Timing Mode (Max 19 chars). Possibilities listed below.

  MS300 Possibilities:
      STOPWATCH
      TIME
      COUNT DOWN
      JUMPING A
      JUMPING B
```

Download end marker (DE):

```
<S>DE_RR<E>

R = Run number (always 01)
```

Run, Added Run, Intermediate and Differential Result (RR, GR, IR, DR):

```
<S>RR_ZZZZ_NNNN____HH:MM:SS.FFFFF<E>
<S>IR_I____NNNN____HH:MM:SS.FFFFF<E>

Z = Rank
N = Candidate number (1 - 9999)
I = Inter number
H = Hours (0 - 23)
M = Minutes (0 - 59)
S = Seconds (0 - 59)
F = decimal part (0 - 99999)
```

System Event (&S):

```
<S>&S_EAABBCCDDEEFFGGHH<E>

E = Event ID
A = 1st parameter (Hex format)
B = 2nd parameter if required (Hex format)
...
H = 8th parameter if required (Hex format)

   E =  0 -> Buttons(A = Activated key)
                        Bit0 = SPLIT button
                        Bit1 = MEMORY button
                        Bit2 = MODE button
                        Bit3 = START button

        1 -> Buzzer (A = Frequency, B = Beep time in 10ms)
                        Frequency [Hz] = 125000 / A (Ex: "FA" =  500Hz)

Example:
Button START is pressed:                                  "&S 008\r\n"
Button START is released:                                 "&S 000\r\n"
Button SPLIT and MEMORY are pressed:                      "&S 003\r\n"
Button SPLIT is released, MEMORY still pressed:           "&S 002\r\n"

Buzzer is turn on at 500Hz during 500ms:                  "&S 1FA32\r\n"
Buzzer is turn on at 1000Hz during 1s:                    "&S 17D64\r\n"
```

Device specific Event (&E):

For HL940:

<S>&E_MXX<E>

M = MS300 active mode
- 0 = Stopwatch mode
- 1 = Time mode
- 2 = Countdown mode
- 3 = Jumping A mode
- 4 = Jumping B mode
- 5 = Date mode
- 6 = Configure date
- 7 = Configure time
- 8 = Configure Countdown
- 9 = Calibration mode

X = MS300 program event register (Hex format)
- BIT0 = Mode is changed
- BIT1 = the race is started
- BIT2 = the race is splited
- BIT3 = The countdown is finished
- BIT4 = The intermediate time is finished (mode JMP B)
- BIT5 = The race is paused
- BIT6 = The race or countdown is restart
- BIT7 = The race is stopped

Example:

Stopwatch race is started:	"&E 002\r\n"
Countdown is paused:	"&E 220\r\n"
Timing mode is changed to "Date" mode:	"&E 501\r\n"

Special case:

Countdown finished and restarts automatically:	"&E 248\r\n"
Jumping A is restarted after a pause:	"&E 360\r\n"
Jumping B is restarted after a pause:	"&E 460\r\n"
Jumping A Run is canceled:	"&E 3C0\r\n"
Jumping B Run is canceled:	"&E 4C0\r\n"
MS300 is reset (clear all memory):	"&E 041\r\n"

Serial number + Device type + soft version request (SN):

```
<S>#SN<E>
<S>SN_NNNNN_TTTTT_VVVV<E>

N = Serial number (0 – 65535)
T = Device type (MS300)
V = Software version (example: VA05)
```

Synchro time request (#!T):

```
<S>#!T<E>
<S>!T_HH:MM:SS_DD/XX/YY<E>

H = Hours (0 – 23)
M = Minutes (0 – 59)
S = Seconds (0 – 59)
D = Day
X = Month
Y = Year
```

Serial number programming (#MC): !!! For factory use only !!!

```
<S>#MC_04660_XXXXX<E>

X = Serial number (0 – 65535)
```

Read a parameters (#RP):

```
<S>#RP_III…<E>

I = parameter ID (000 – 999)
…. = See the parameters list on chapter 3.2.
```

Write a parameters (#WP):

```
<S>#WP_III…<E>

I = parameter ID (000 – 999)
…. = See the parameters list on chapter 3.3.
```

1.2 Lectures de paramètres

002 : Timing mode

```
#RP_002
 &P_002_XX

XX = Timing mode (HEX format)

For MS300:
   00 = Stopwatch mode
   01 = Time mode
   02 = Countdown mode
   03 = Jumping A mode
   04 = Jumping B mode
   05 = Not used.
   06 = Date mode
   07 = Configure date
   08 = Configure time
   09 = Configure Countdown
   0A = Calibration mode
```

025 : Power supply status

```
#RP_025
 &P_025_XX_YYY_ZZZ

X = Status register (Hex format)
Y = Battery voltage (0.1V step)
Z = Battery level in % (0-100)

For MS300:
    00 =  Battery Full (more than 25%)
    01 =  Battery Low (10% - 25%)
    02 =  Battery Empty (less than 10%)
    03 =  Battery in charge
    04 =  Battery fully charged
```

Note:
These case cannot append as when the USB is connected, the charge is always active or done. Could be used in future if a radio will be developed.

026 : Next candidate number

#RP_026
&P_026_XX_YYYY

X = Input Number (always 00)
Y = Candidate number (0000 – 0800)

038 : Memory Free

#RP_038
&P_038_XXXXX

X = Memory free value

039 :Run status

#RP_039
&P_039_XX

XX = Status of the RUN (Hex format)

For MS300:
00 = No race started
01 = Race started (Only in mode Stopwatch, Time & CountDown)
02 = Race paused (Only in mode Stopwatch & CountDown)
03 = CountDown finished, race stopped.
04 = Jumping CountDown (Only in mode Jumping A & B)
05 = Jumping Race started
06 = Second section of Jumping B
07 = Jumping CountDown paused
08 = Jumping Race (first section) Paused
09 = Second section of Jumping B Paused
0A = Jumping race Finished
0B = New candidate ready to start (only in mode Jumping A & B)

103: Count Down

#RP_103
&P_103_XX_YYYY

X = Program number (always 00)
Y = Count Down value (0000-3599 [sec])

1.3 Ecriture de paramètres

103: Count Down

#WP_103_XX_YYYY

X = Program number (always 00)
Y = Count Down value (0000-3599 [sec])

Example:
Set the Count Down at 1min30: "#WP 103 00 0090\r\n"

1.4 Liste des commandes

003 : Open a timing Mode

```
#WC_003_XX

X = Timing Mode (00-06)
    00 =  Stopwatch mode
    01 =  Time mode
    02 =  Countdown mode
    03 =  Jumping A
    04 =  Jumping B
    05 =  Jumping C (Not used)
    06 =  Date mode
```

005 : Clear Memory

```
#WC_005_XXXXX

X = Security code (12345)
```

007 : Start a new synchro

```
#WC_007_TT_HH:MM_DD/XX/YY

T = Synchro Type.
     00 -> Not valid
     01 -> Internal Synchro (take the internal RTC time for synchro)
     02 -> Manual Synchro
     03 -> Not Valid
     04 -> Not Valid
     05 -> Not Valid
     06 -> Configure the internal RTC time (change automatically the mode to
     "Configure Time" mode, and wait a manual synchro (button or input))

If Manual Synchro is chosen:
H = Hour
M = Minute
D = Day
X = Month
Y = Year

Example:
Take the internal RTC time for a new synchro: "#WC 007 1\r\n"
Configure the internal RTC time:              "#WC 007 6 16:27 28/01/13\r\n"
```

008 : Trigger a manual input pulse

```
#WC_008

Simulate an impulse on the MS300 input.
```

009 : System cmd

```
#WC_009_XYYZZ

X = Cmd Id
Y = First parameter (Hex format)
Y = Second parameter if required (Hex format)

For HL940 & HL440:
 X = 0 -> Button
     Y = Button activated (HEX Format
          01 = SPLIT Button
          02 = MEMORY Button
          04 = MODE Button
          08 = START Button

     1 -> Buzzer   (Y = Frequency, Z = Beep time in 10ms)
                     Frequency [Hz] = 125000 / A (Ex: "FA" =  500Hz)


Example:
Activate the SPLIT Button:                    "#WC 009 001\r\n"
Activate the MEMORY Button:                   "#WC 009 002\r\n"
Activate the MODE Button:                     "#WC 009 004\r\n"
Activate the START Button:                    "#WC 009 008\r\n"
Disable all the button:                       "#WC 009 000\r\n"


Turn on the Buzzer at 500Hz during 250ms:     "#WC 009 1FA19\r\n"
```

012 : Download all the time in memory

```
#WC_012

Example:
#WC 012
DS 01 012 STOPWATCH
RR 0000 0001   00:00:00.98999
RR 0000 0002   00:00:01.28750
RR 0000 0003   00:00:01.53280
RR 0000 0004   00:00:01.77548
RR 0000 0005   00:00:02.01196
RR 0000 0006   00:00:02.20843
RR 0000 0007   00:00:02.46044
RR 0000 0008   00:00:02.69540
RR 0000 0009   00:00:02.90020
RR 0000 0010   00:00:03.19195
RR 0000 0011   00:00:03.61431
RR 0000 0012   00:00:03.88693
RR 0002 9999   00:00:28.35296
DE 01

#WC 012
DS 01 012 JUMPING B
IR 1    0001   00:00:01.39877
RR 0000 0001   00:00:03.03781
IR 1    0002   00:00:00.95498
RR 0000 0002   00:00:03.30108
IR 1    0003   00:00:01.39743
RR 0000 0003   00:00:02.85546
IR 1    0004   00:00:01.66546
RR 0000 0004   00:00:03.43017
IR 1    0005   00:00:01.18322
RR 0000 0005   00:00:13.85415
IR 1    0006   00:00:01.38339
RR 0000 0006   00:00:04.09866
RR 000B 9999   00:00:04.09866
DE 01
```

Note : The last time is the stopped time (when the run is in Pause) or the running time (Race active). The Rank number is used to indicate the RUN Status (same value as command #RP 039). The candidate number is always set at 9999 to distinguish it.

016 : Activation/Deactivation of events messages

#WC_016_XX

X = Activation register (hex format)
X = 0 -> All events are deactivated
Bit_0 -> Not valid
Bit_1 -> Not valid
Bit_2 -> Activate System events '&S'
Bit_3 -> Activate Device specific events '&E'
Bit_4 -> Activate Timing events 'RR'

All events are disable as soon as the USB in unplugged.

Example:

Enable system events (Buzzer and Button):	"#WC 016 04\r\n"
Enable Device specific events:	"#WC 016 08\r\n"
Enable all events:	"#WC 016 1C\r\n"
Disable all events:	"#WC 016 00\r\n"