## FULL CONTROL of the CLOCK
## via SERIAL COMMUNICATION OR ETHERNET/INTERNET

It is possible to control all clock operations and functions via serial communication or via wired Ethernet, or WiFi communication.

Clocks with this option must have appropriate hardware installed and enabled.

Two functions Fn67 and Fn108 enable these options.
All communication is Half-Duplex.
The protocol used for this functionality is 17 bytes long and each clock is addressable with its ID number that can be preset via the IR remote control or via the serial communication commands.
The clock issues handshake packets for most of the commands with some exceptions and can also transmit some internal data and timing parameters.
For more detail please see the corresponding instructions manuals and descriptions.

### SHORT LIST OF COMMANDS

| Command Designation | Command Code ( $HH = 0xHH ) |
|---|---|
| NOT USED ( will be ignored by receiver ) | $00 [ 00000000 ] |
| **ENABLE THE FUNCTION** as in byte #6 | $01 [ 00000001 ] |
| ( return byte #5 as = 0 if factory disabled ) | |
| **DISABLE THE FUNCTION** as in byte #6 | $02 [ 00000010 ] |
| ( return byte #5 as = 0 if factory disabled ) | |
| **STORE TIMER PRESET VALUES & DISPLAY** | $03 [ 00000011 ] |
| The preset values are as in [byte#12:byte#7] | |
| ( here only 6 digits are preset in [byte#10:byte#8] | |
| **CLEAR PRESET and START UP TIMER FROM 00:00:00** & clear F109 | $04 [ 00000100 ] |
| **START DOWN TIMER FROM PRESET REG's** & clear F109 | $05 [ 00000101 ] |
| **START UP TIMER FROM PRESET REG's** & set F109 | $06 [ 00000110 ] |
| **CLEAR TIMER COUNTER TO 00:00:00 & DISPLAY** | $07 [ 00000111 ] |
| **HALT TIMER & DISPLAY** | $08 [ 00001000 ] |
| **RESUME TIMER** ( after HALT ) | $09 [ 00001001 ] |
| **STOP TIMER** ( not HALT ) | $0A [ 00001010 ] |
| **RESET TIMER TO PRESET REGISTERS** | $0B [ 00001011 ] |
| **START RETURN TIMER** | $0C [ 00001100 ] |
| ( command START RETURN DISPLAY is also set ) | |
| ( Hrs,Min,Sec,1/100Sec in HEX in bytes 4,5,6,7 ) | |
| **SET CLOCK ID** as in byte #12 | $0D [ 00001101 ] |
| **SET ZONE OFFSET** as in [byte#4:byte#3] | $0E [ 00001110 ] |
| **LOAD TEXT DISPLAY** with 11 characters as in [byte#12:byte#2] | $0F [ 00001111 ] |
| **START DISPLAY SEGMENTS** | $10 [ 00010000 ] |
| **STOP DISPLAY SEGMENTS** | $11 [ 00010001 ] |
| **LOAD LED SEGMENTS** as in [byte#9:byte#4] | $12 [ 00010010 ] |
| **DISPLAY REAL CLOCK** | $13 [ 00010011 ] |
| **RESUME DISPLAY SCROLL** ( UNFREEZE ) ( digits and text ) | $14 [ 00010100 ] |
| **HALT DISPLAY SCROLL** ( FREEZE ) ( digits and text ) | $15 [ 00010101 ] |
| **FREEZE & FLASH DISPLAY** ( freeze all flash digits ) | $16 [ 00010110 ] |
| **STOP FLASH DISPLAY** ( but not unfreeze ) | $17 [ 00010111 ] |
| **START RETURN DISPLAY** ( at 1 sec flips ) | $18 [ 00011000 ] |
| ( Display in bytes 4,5,6,7,8,9 Milisec in Byte 2, Byte#13=$7F) | |
| **STOP RETURN DISPLAY,TIMER OR CLOCK** | $19 [ 00011001 ] |
| **START RETURN CLOCK** | $1A [ 00011010 ] |
| ( 11 digits in bytes 2-12 ) | |
| ( For SecL:H,MinL:H, HrsL:H, DayL:H, Mth, YrL:H ) | |
| ( Also clears command to return Timer Count ) | |
| **SET REAL CLOCK** ( 11 digits in bytes 2-12 ) | $1B [ 00011011 ] |
| ( For SecL:H,MinL:H, HrsL:H, DayL:H, Mth, YrL:H ) | |
| **SET COMM IDLE & SILENCE PERIODS** [byte#4:byte#3] | $1C [ 00011100 ] |
| ( Pace timer = byte #4 in 0.5 ms, Silence timer = Byte #3 in sec ) | |
| **SET BRIGHTNESS** as in byte #12 | $1D [ 00011101 ] |
| **DISPLAY TIMER** | $1E [ 00011110 ] |
| **START UP TIMER FROM 00:00:00** & clear F109 | $1F [ 00011111 ] |
| **RELOAD TIMER PRESET FROM MEMORY** | $20 [ 00100000 ] |
| **SET RED COLOR** | $21 [ 00100001 ] |
| **SET GREEN COLOR** | $22 [ 00100010 ] |

**NOTE: Custom modifications of communication parameters and commands are available upon request.**