LED DISPLAY

HMT & HMS LED

Time and temperature display

Installation instructions

Bodet
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Upon receipt, always check the product for damage during shipment. If any is found, you may file a damage claim with the carrier.

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Table of contents

I - General description 3

II - Mechanical installation 4

II.1 Dismantling to get inside the clock 4
II.2 Wall fixing 4
II.3 Fixing on double sided bracket (only for HMT LED 10, 15, 20 and 25)..... 4

III - Electrical installation 9

III.1 Power supply 11
III.2 DCF antenna 11
III.3 GPS antenna 11
III.4 Installation of a time distribution card 11
III.5 Installation on an AFNOR network 12
III.6 Installation on a minute or 1/2 minute network 13
III.7 Installation on a DHF network 14
III.8 Installation on an NTP network 15
III.9 Installation on an RS232/RS422 ASCII network 24
III.10 Installation of the temperature/humidity probe 25
III.11 Installation of hard-wired temperature sensor 25
III.12 Installation of HF temperature sensor 26
III.13 Repeater for double sided clock 26
III.14 Configuration of DIP switches 27
III.15 Clocks in series 27
III.16 Pairing a HF remote control unit 28
III.17 Identification of the electronic cards 28

IV - Settings menu 30

IV.1 Main menu 31
IV.2 CHRO menu: count-up and count-down setting 32
IV.3 TIME menu : setting the time and date 33
IV.4 INFO menu: setting of chlorine and humidity values 34
IV.5 PROG menu: brightness, temperature and alternation setting 35
IV.6 TECH menu : technician 37
IV.7 TEST menu : test and version display 42
IV.8 Displaying a numerical value 43

V - Types of time synchronisation 45

VI - Technical features 46

2

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I - General description

The HMT & HMS LED is an outdoor clock.

- High brightness SMD LED, 4 digits and 3 dots.
- Fixed or alternating display.
- Display: time (with seconds for 'HMS), temperature, date, chlorine level, humidity level, chronometer (countup, countdown, day), numerical value.
- 110 / 230 V 50/60 Hz power supply.
- Aluminium casing. (HMT10 and HMS10 in steel).
- 2 LED colours available: Red (R), Yellow (J) White (W).
- Automatic brightness control according to sunlight, clouds, night time, independently per face.

CAUTION : *Installation and maintenance of this equipment should only be carried out by qualified personnel. Since the HMT LED is connected to a mains supply or 115V, it must be installed in compliance with standard IEC 364. The mains supply for the clock must include a neutral phase circuit breaker (16A maxi), rapidly accessible upstream from the supply. This circuit breaker must be switched off during maintenance operations. This material must be installed before switching on. Any modification to the product will invalidate the guarantee.*

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II - Mechanical installation

Choose the clock location taking into account, for clock connected to a DCF antenna, the quality of the radio synchronizing signal.

The clock shall be away from any sources of electromagnetic interference.

II.1 Dismantling to get inside the clock

Unscrew the 2 (HMT/HMS LED 10, 15, 20 and 25) or 4 screws (HMT/HMS LED 45) on the right side of the clock to remove the right part. The programming keys can now be reached. This is the left side for HMT / HMS Led 10.

If necessary, it is possible to have access to other elements (switching power supply, CPU card, modules ...) by removing the glass. Pull the glass laterally 5 to 10 cm then lift it and pull it to take it out from the profile at the bottom the clock.

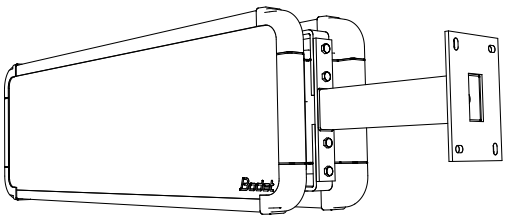
II.2 Wall fixing

Fix the clock with the 4 screws Ø6 (not supplied) (HMT/HMS LED 10, 15, 20 and 25) or the 6 screws Ø8 (not supplied) (HMT/HMS Led 45) and the appropriate plugs. Make use of the 4 oblong holes behind.

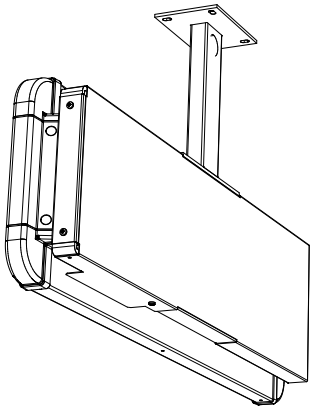
Note: make use of the drill template provided.

II.3 Fixing on double sided bracket (only for HMT LED 15, 20 and 25)

The bracket can be installed vertically or horizontally and is designed for one or two clocks.



Double sided fixing with horizontal bracket



Single sided fixing with vertical bracket

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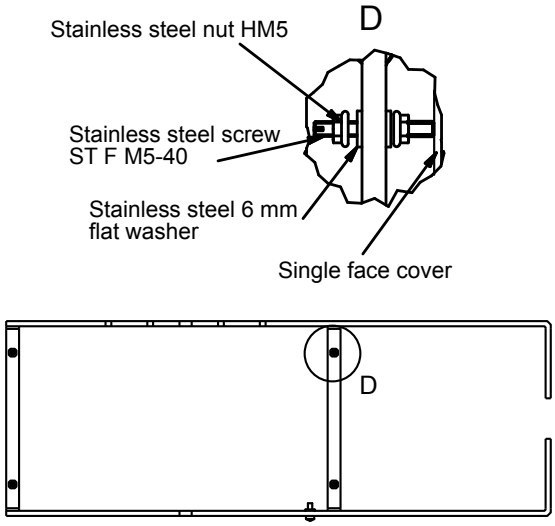
Single face assembly

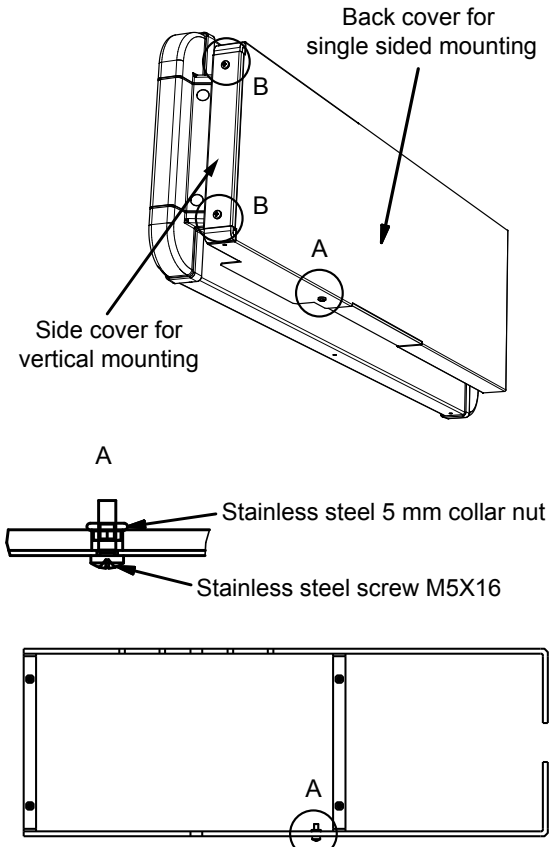
1/ Place the 4 screws and washers (detail D) on the double face support.



2/ For single face assembly, it is possible to install a single face cover (optional) on the back of the clock by fitting it on the double face support. Lock it in place with the bottom collar nut (detail A).

3/ Tighten the 4 screws in contact with the vert. bracket single face cover and then lock the 4 nuts on the double face support.

4/ For a vertical bracket only, attach the cover of the bracket on the side of the double face support with the two 5 mm screws (detail B).



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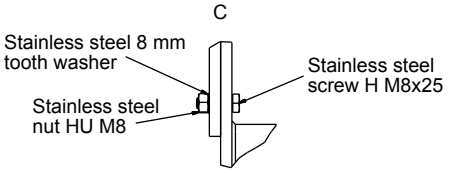
5/ Attach the bracket to the wall with the two 8 mm (HMT Led 10) or four 8 mm (HMT Led 15 and 20) or 10 mm (HMT Led 25) threaded rods plus chemical sealing (recommended).

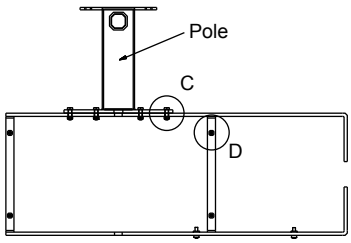
6/ Attach the double face support to the bracket with the two 8 mm screws (HMT Led 10) four 8 mm screws (HMT Led 15, 20 and 25) detail C. Remember to insert the cables in the bracket.

7/ Open the clock, remove the glass and unscrew the wall attachment parts.

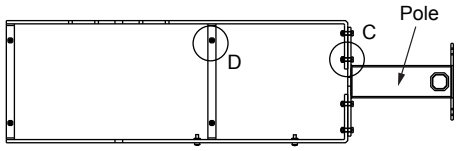
8/ Attach the clock to the double face support on the 4 screws ST F M5-40 (detail D). Place the 6 mm washers (detail D) flat on the double face support (and not inside the clocks) to move the clocks sufficiently far away and facilitate insertion of the cables. Screw in the 2 nuts at the top (D) without tightening, move the clock away and insert the cables.

9/ If cables are correctly positioned, tighten the 4 nuts (D) of the readout.

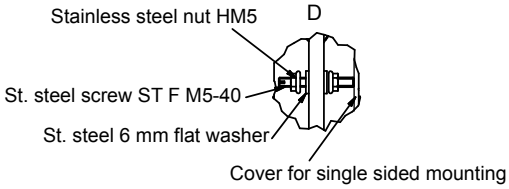




Vertical mounting



Horizontal mounting



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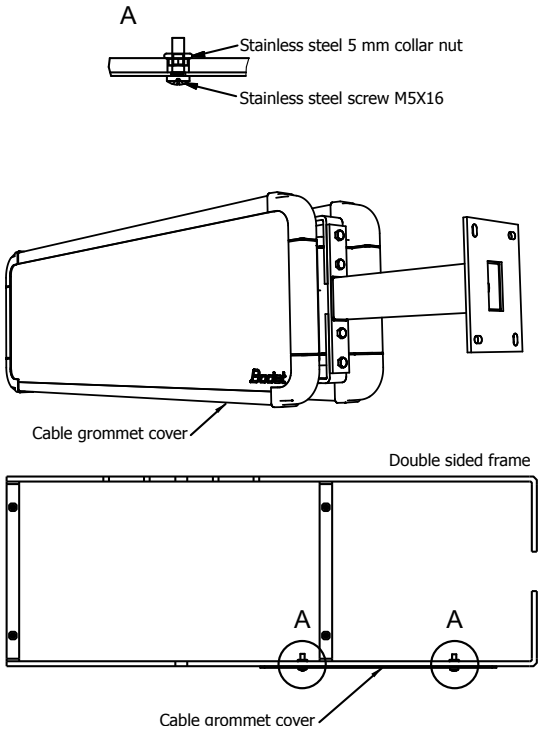
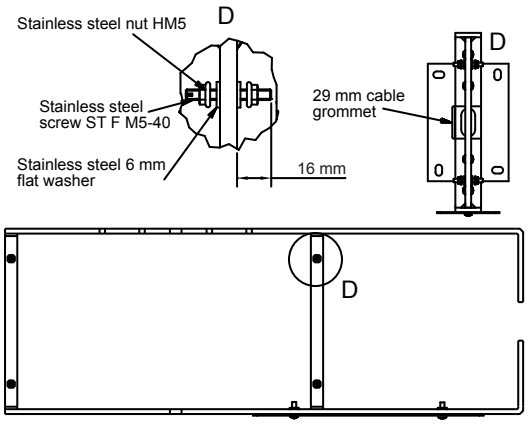
Double face assembly

1/ For double face assembly only, fit the cable grommet cover (supplied in standard version) under the double face support, attaching it with the 2 screws at the bottom (detail A).



2/ Attach the cover of the bracket on the side of the double face support (only with vertical bracket) with the two 5 mm screws (detail B) (see single face assembly 4/).

3/ Place the 4 screws (D) at 16 mm. Do not fit the nuts and washers.



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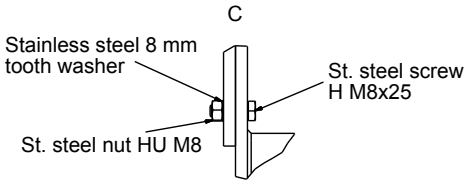
4/ Attach the bracket to the wall with the two 8 mm (HMT Led 10) or four 8 mm (HMT Led 15 and 20) or 10 mm (HMT Led 25) threaded rods plus chemical sealing (recommended).

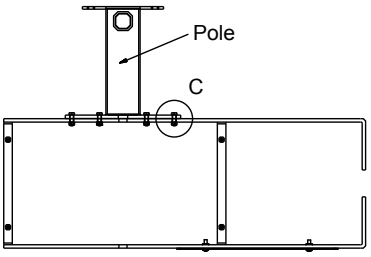
5/ Attach the double face support to the bracket with the two 8 mm screws (HMT Led 10) four 8 mm screws (HMT Led 15, 20 and 25) (detail C). Remember to insert the cables in the bracket.

6/ Open the clocks, remove the glass and unscrew the wall attachment parts.

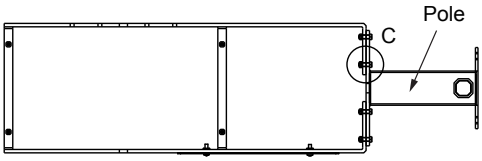
7/ Attach the first clock (repeater clock) to the double face support on the 4 screws ST F M5-40 (D). Place the 6 mm washers (detail D) flat on the double face support (and not inside the clocks) to move the clocks sufficiently far away and facilitate insertion of the cables. Screw in the 2 nuts at the top (D) without tightening, move the clock away and insert the cables.

8/ Attach the second clock (master clock) on the other side of the double face support with the same 4 screws ST F M5-40 (D). Screw in the 2 nuts at the top (D) without tightening, move the clock away and insert the cables. Refer to section III Electrical Installation.

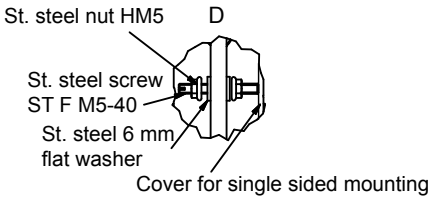




Vertical mounting



Horizontal mounting



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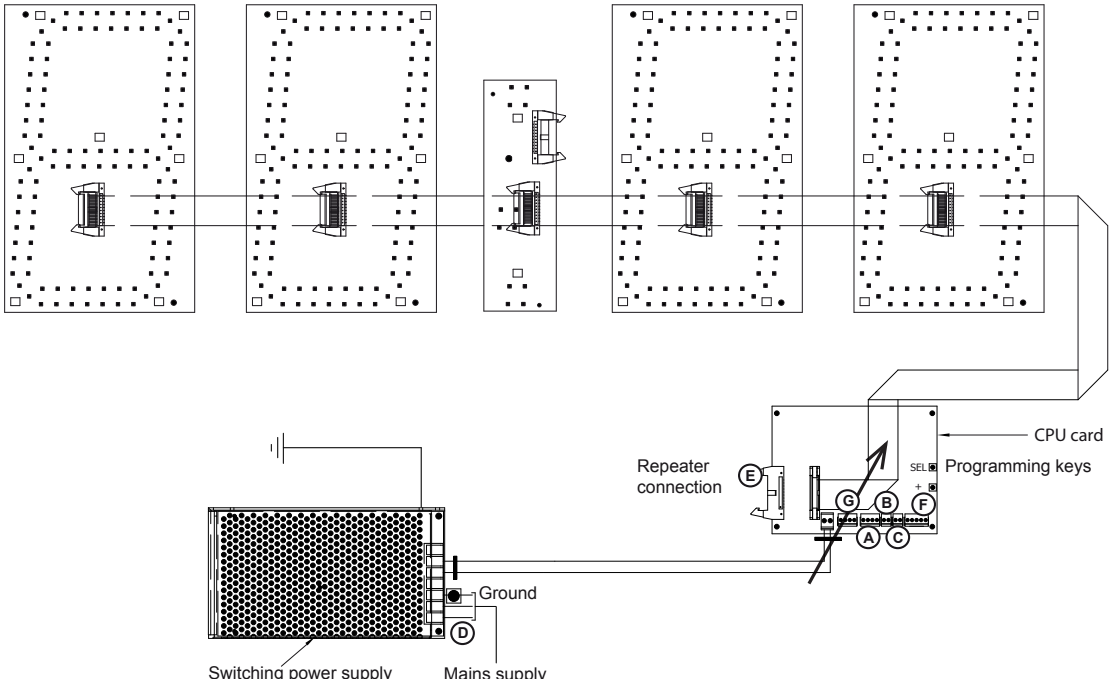
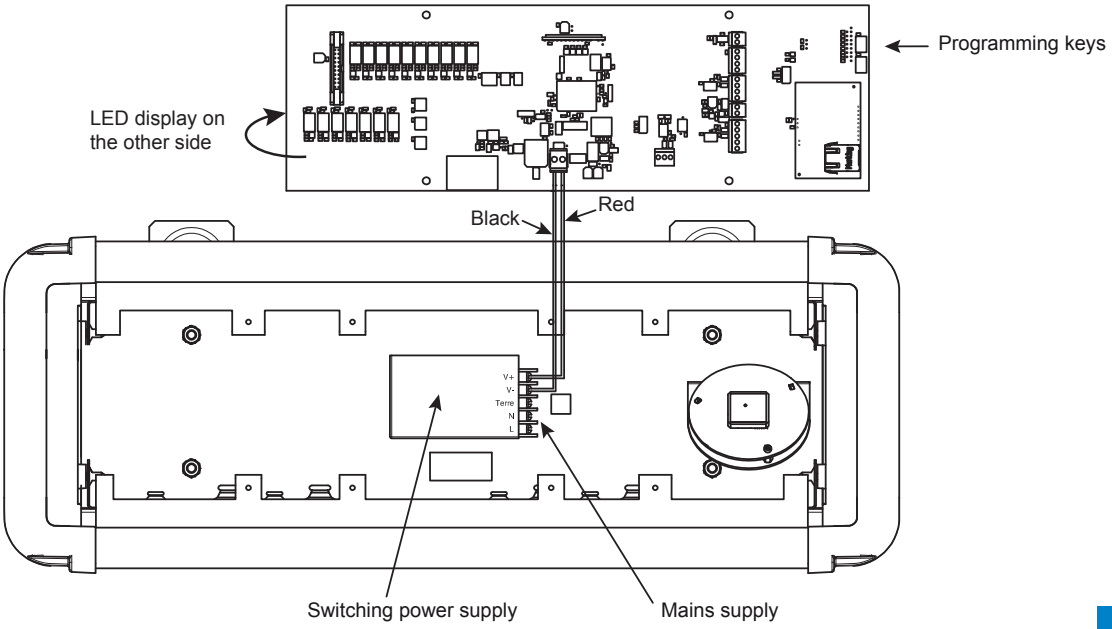
III - Electrical installation

Advice : to prevent the cable from moving, it is recommended to use cable ties near each cable entry inside the clock.
On some clock models, it is necessary to remove one display module in order to freely access the terminal blocks. When putting it back in place, check the its orientation.

HMT-HMS Led 15 20 25 45



HMT-HMS Led 10



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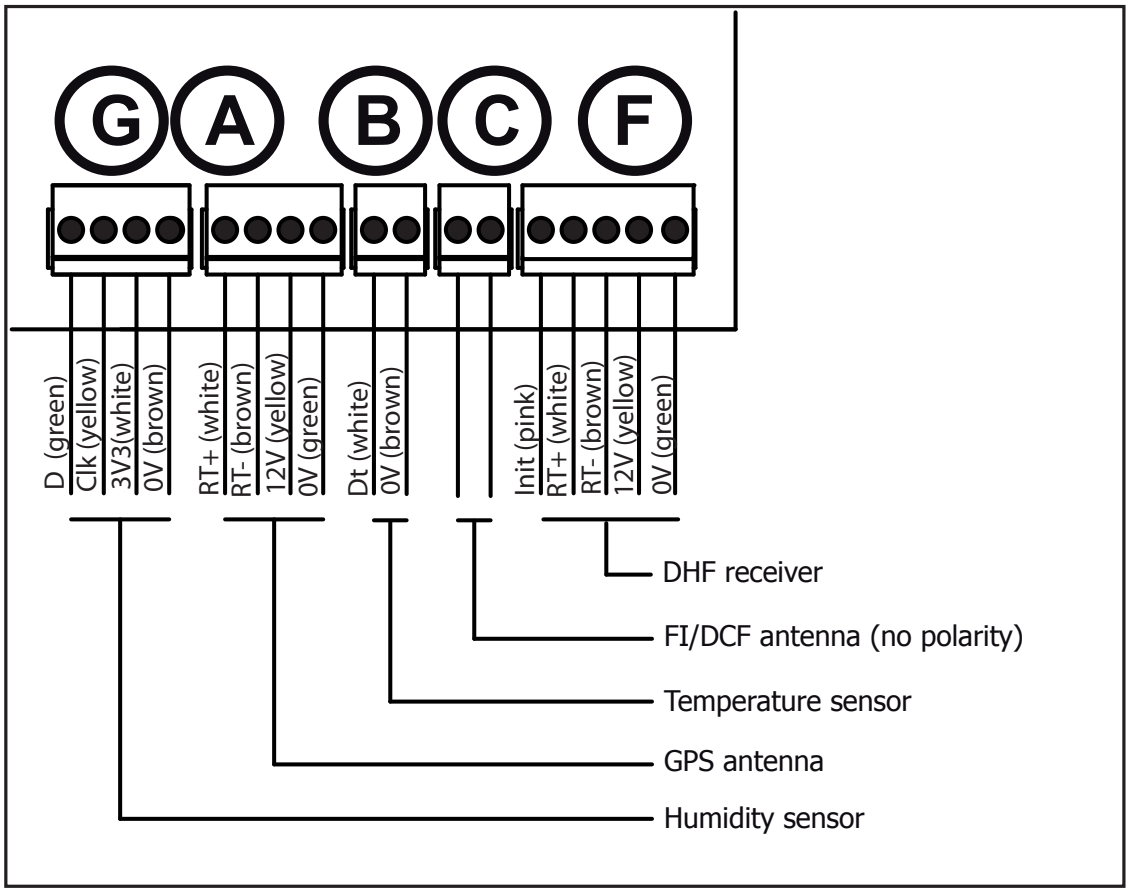
Ilustration of the wiring:



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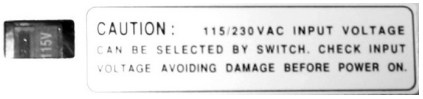
III.1 Power supply



The switching power supply works normally with 230V 50/60Hz but it can works also with 115V.

Nota : the 230V/115V input voltage switch is located under the switching power supply. To access the switch, dismantle the digit in front of the switching power supply, unscrew the HM8 screw and remove the fixing plate. Push the switch to 115VAC and fit everything together again.

Connect the mains supply to the switching power supply (D) located behind the protection glass of the clock.

Nota 1 : remove the protection glass to access to the switching power supply (see § II.1).

Nota 2 : The adhesive protection that has been supplied must be put above the switching power supply terminals when cabling is completed. It prevents from any direct contact with dangerous voltage.

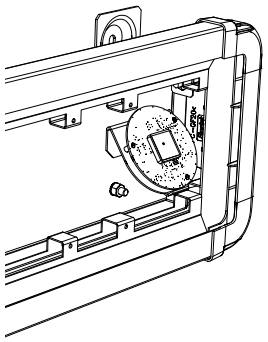
III.2 DCF antenna

When connected to a DCF antenna, the clock is set automatically to the right time. However, it is still possible to set the clock manually following the instructions given page 31.

In case of difficult reception, the signal acquisition can last many hours (The signal is usually well received during the night).

Connect the antenna on the terminal (C) of the electronic card. There is no polarity to be respected. **For a better reception, put the antenna outside the clock.**

III.3 GPS antenna



To get high precision worldwide, it is possible to connect a GPS antenna to the clock.

The clock is delivered with the GPS antenna fixed inside.

Ensure that the GPS antenna is properly connected to the terminal (A) of the electronic card. There is no polarity to be respected.

Note: synchronisation of the GPS antenna can only be carried out with a clock installed outdoors. Otherwise, the antenna will have to be placed outside the building in an unobstructed area.

III.4 Installation of a time distribution card

AFNOR, DHF, ASCII or NTP Pulse cards are pre-installed at the factory.

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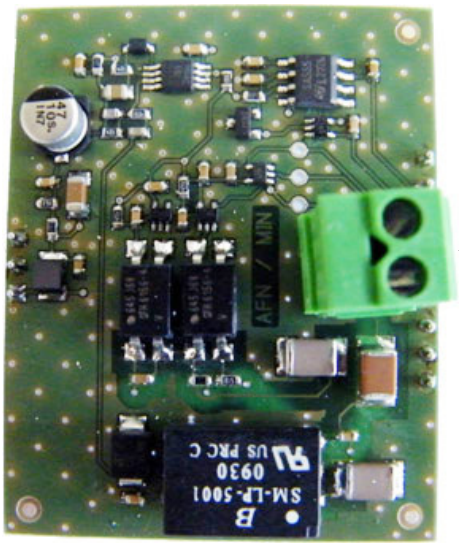
III.5 Installation on an AFNOR network

Connect the cable as shown in the diagram below (non-polarised inputs).

The clock sets itself to the right time after receiving several coherent time messages. Between successive synchronisations, the time base changes normally in accordance with the internal base.

If the clock is in COD mode (see page 38), the time displayed is the time received. If the clock is in LOC mode (see page 38), the time displayed takes into account the time differences chosen in the time menu (time difference and summer/winter.



AFNOR input

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III.6 Installation on a minute or 1/2 minute network

A “Minute” or “½ minute” distribution network only transmits impulses. It is therefore necessary to set the receiver clocks to the time of this network.

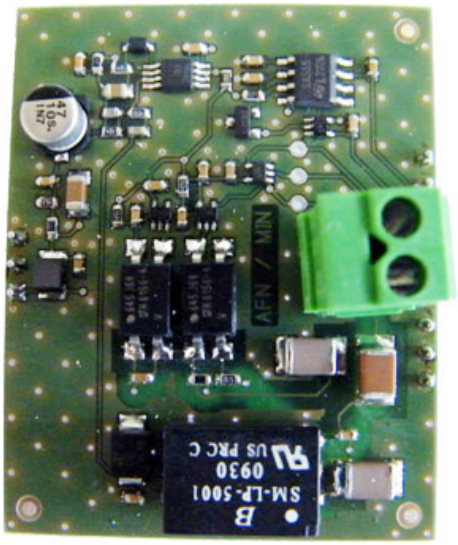
It is not necessary to stop the distribution to add the clock. Simply set it to the right time and it will increment by one minute on reception of the next impulse from the master clock.

If in spite of the time setting you still have a time difference of 30 seconds (1/2 minute) or 1 minute (minute), reverse the connection of the line.

Connect the cable as shown in the diagram below.

Then move on to the programming in the technician menu (page 37).

***Note for series 1/2 minute**: to avoid cutting off the network when a receiver clock is disconnected, also connect a 33-Ohm resistor (supplied) at the terminal strip input.*



Input pulse minute 24V parrallel, 24V parallel ½ minute or ½ minute series

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III.7 Installation on a DHF network

The first time you switch it on, you must set the clock to INIT mode (see page 37) in the technician menu.

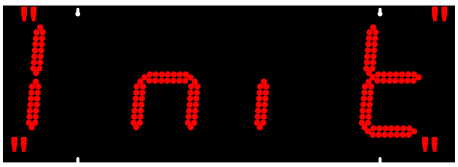
INIT mode enables matching with a master clock which is itself in INIT mode.

It switches to normal mode automatically on reception of the time from the master clock, memorising the address of the transmitter.

In the event of interference or absence of reception, it continues to function with its time base.

If need be (transmitter channel change, new installation, etc.), it is possible to reset the clock to “Initialisation” mode in the technician menu.

The receiver is supplied installed inside the clock. Check that the receiver is correctly connected on the terminal strip of the electronics board.



DHF antenna

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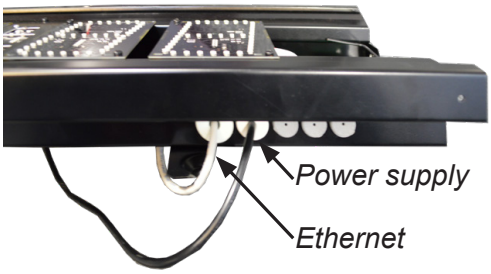
III.8 Installation on an NTP network

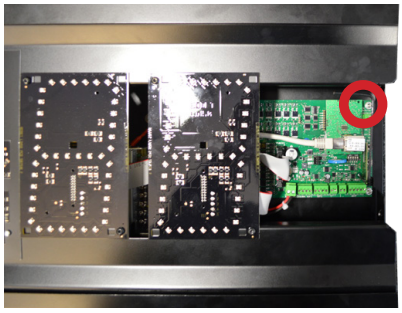
The clock's time is automatically set upon receiving several harmonised time signals.

Open the HMT LED clock to access the electronic card (consult chapter **II.1 Dismantling to get inside the clock** page 4)

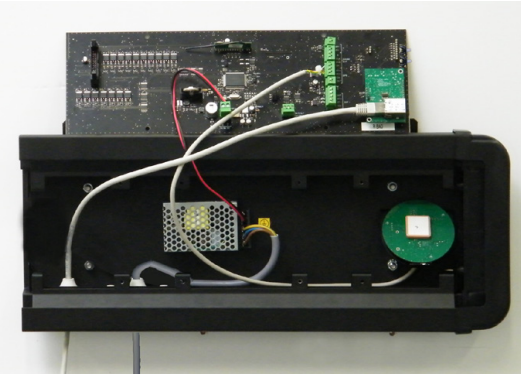
Connect the clock to the computer network via a RJ45 Ethernet cable by passing it through the cable gland:



HMT-HMS Led 15, 20, 25 and 45



HMT-HMS Led 10



The full factory settings are the following:
- Clock name: «BODET-@MAC»
- IP configuration by DHCP
- Time zone : Paris (GMT+01:00)
- Multicast synchronisation
- Synchronisation address: 239.192.54.1
- Pool period for unicast synchronisation: 15 min.
- SNMP disabled
- Trap type: V2C
- Temperature alarm threshold: -20°C to +55°C
- Trap status sending interval: 24H
- No password

The clock is configured via the web server.
Note : It is impossible to locate (via Bodet Detect for example) an HMT LED which is not displaying the time.

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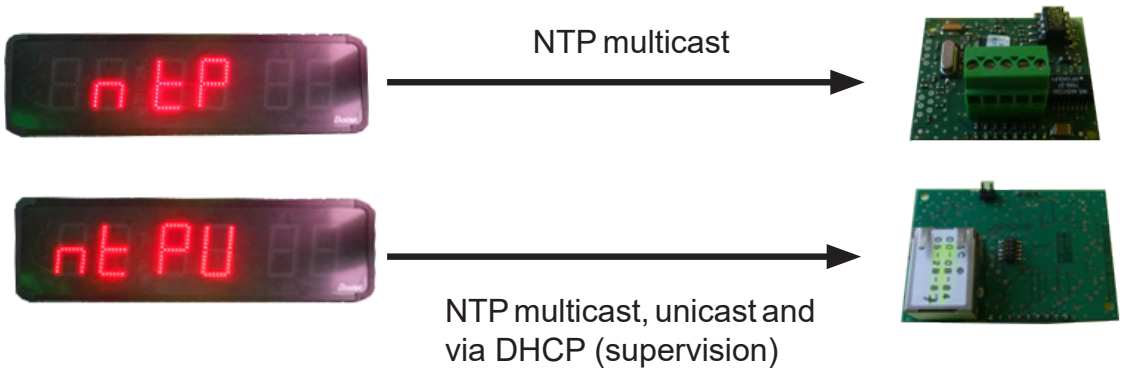
Depending on the option card used, choose the type of synchronization in the TECH menu (see chapter IV.6 TECH menu: technician page 37).



IMPORTANT: In case of card reversal or parameter setting, the displayed time will not be the correct time, according to the time zone.

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Web interface
(concerns only NTP synchronised clocks)
To identify the location of the clock(s) on the network, use the Bodet Detect software.

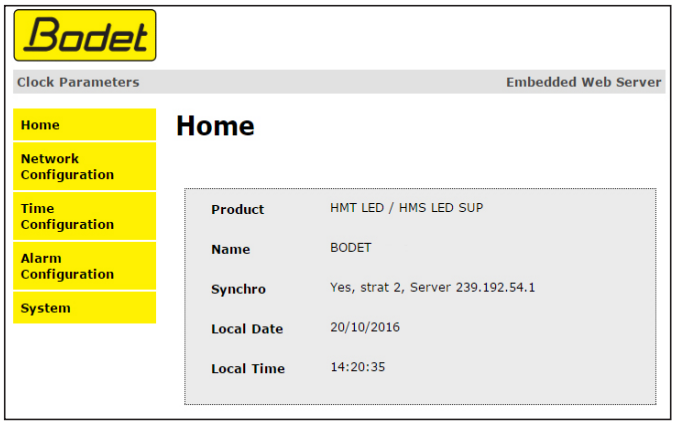
The version of this software must be earlier than the V1.1A50 version.

The 'local' function allows you to identify the clock on the network.

This alternates between displaying 2:22 then 1:11 every 3 seconds.

The BODET Detect software lets you:
- detect all the clocks present on the network,
- individually set the parameter of each clock or copy the parameter of one clock toward a group of clocks,
- update the clock software,
- check the clock status
- access the download of the MIB files,

> Homepage



The home page presented by the clock's embedded web server provides a general summary of the clock information.
The information is displayed as follows:
- **Product:** product type.
- **Name:** name given by the user to the clock.
- **Synchro:** status of the synchronisation (Strat 3 indicates that the clock is at the 3rd level from the synchronisation source) + IP address of the server on which the is synchronised.
- **Local Date:** current date.

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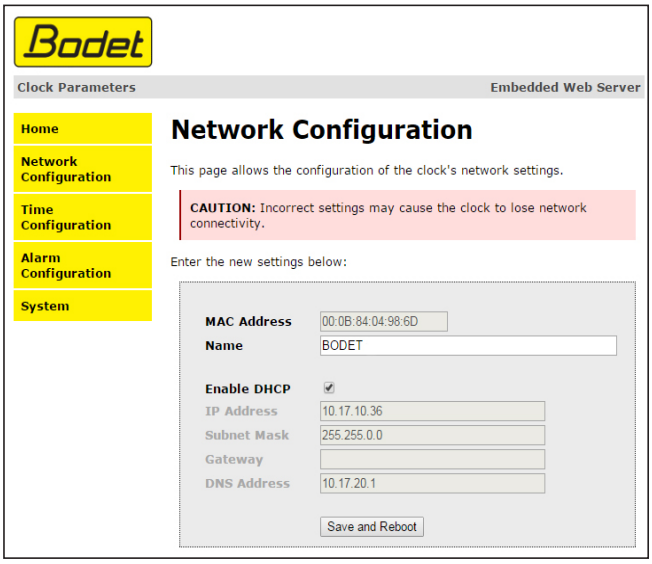
> Network configuration page



This page is for setting the clock's network configuration. The warning reminds you that the clock could lose its connection to the network if incorrect parameters are set.

The information displayed is described below:

- **MAC Address:** this is the clock's MAC address. This address is unique to each device. This number is given on a label on the back of Bodet clocks.
- **Name:** name given by the user to the clock.
- **Enable DHCP** checkbox: if checked, the device's network IP settings will be configured automatically.

If this box is unchecked, the following settings are available:

- **IP Address:** manually sets the device's IP address. (required).
- **Subnet Mask:** the subnet mask associates a clock with the local network. (required).
- **Gateway:** the gateway can be used to connect the clock to two data networks.
- **DNS Address:** this can be used to associate a domain name with an IP address. This avoids having to enter an IP address in the browser: a user-defined name can be used instead.
  Example: www.bodet.com is simpler to remember than 172.17.10.88.

The Save and Reboot button saves your configuration.

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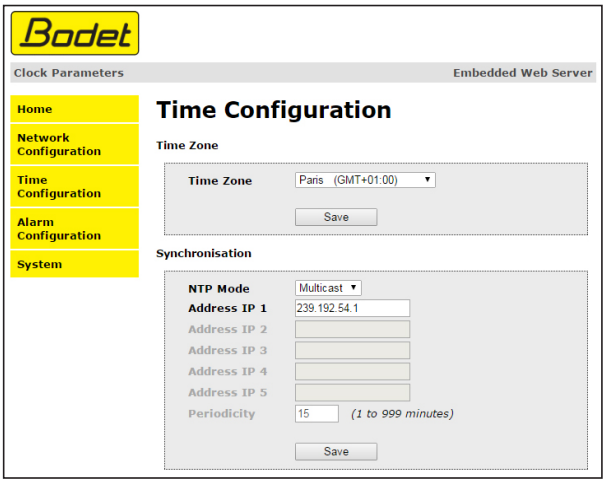
> Time and synchronisation configuration page

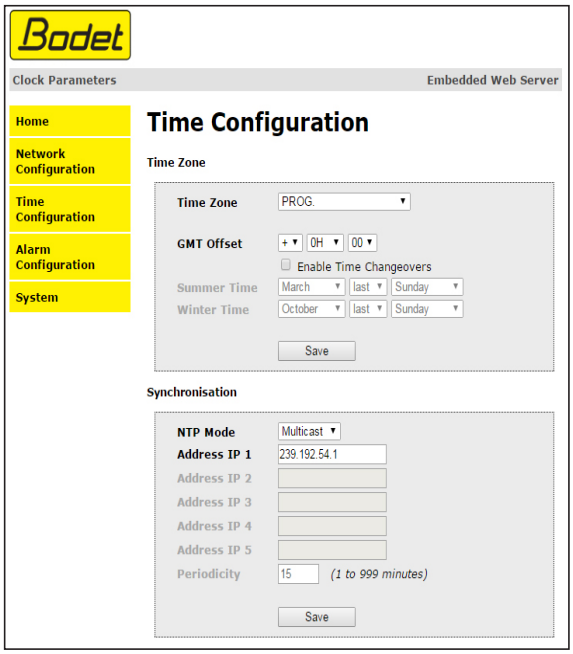


The Time Configuration page is divided into two parts. One is used to set the time zone, the other to set the synchronisation mode.

The information displayed is described below:

- **Time zone:** the drop-down menu can be used to select the appropriate time zone (summer/winter time changes are automatically managed according to the selected time zone).

When «PROG» is selected in the drop down menu, this feature allows you to set the time, month, or day fixed rank changes of seasons:



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- **NTP Mode:** one of three modes may be selected:
  - o **Unicast:** In Address IP 1, enter the IP address of the NTP server. In this case it is the clock that calls the NTP server.
    It is also possible to set up redundancy (if the first server does not respond, the second is queried, and so on): for this purpose up to 5 server addresses may be entered (IP address 1/2/3/4/5).
    The Periodicity field sets the frequency with which the clock queries the configured NTP servers.
  - o **Multicast:** In this case, the NTP server broadcast the time on the multicast address that was that given to it. The multicast address of the clients (reveivers) must be the same that the one on which the server broadcasts.
    By default, the Bodet products transmit or receive using the multicast address: 239.192.54.1
    The multicast addresses are included between 224.0.0.0 and 239.255.255.255.
  - o **By DHCP:** Same mode as Unicast except that the addresses of the NTP servers are gather automatically via the DHCP server (option 42 on the DHCP server).

The checkbox «continues to display» is used to define the behavior of the clock after a loss of NTP for 48 hours:
- In «continues to display» OFF, the clock hands are positioned 12h.
- In «continues to display», the clock continues to run on its internal quartz.

The Save buttons save the configuration data entered.

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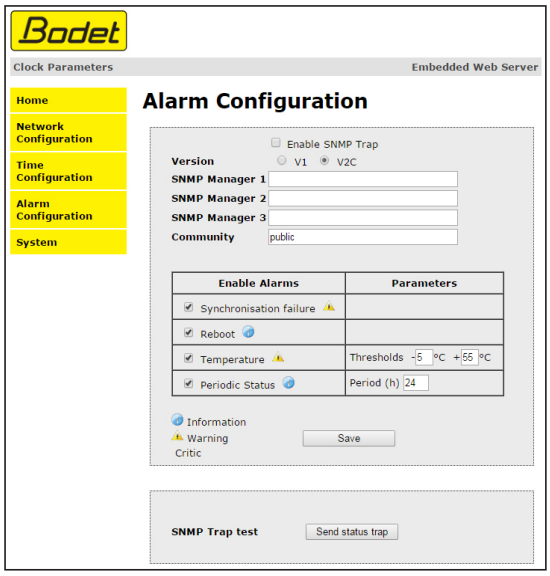
> Alarm configuration page



This page is used to enable monitoring of the clock, and to set which information will be sent as well as the destination server. You can choose which parameter or parameters to define as alarms, and configure them.

The information displayed is described below:

- **Enable SNMP Trap** checkbox: enables or disables automatic sending of error messages to the SNMP Manager(s).
- **SNMP Manager 1/2/3:** IP addresses of servers to receive clock alarms. Using redundant SNMP Managers increases the reliability of reception of alarms.
- **Community:** user-defined clock pool or domain. It is important to give all clocks on the network the same Community name.
- **Synchronisation failure:** this parameter enables detection of synchronisation faults with the «source» (Sigma Master clock).
  Multicast: Alarm triggered when the multicast synchronisation is absent for at least 1hour
  Unicast: Alarm triggered when the unicast synchronisation is absent for 3 times the duration of the poll (periodicity) and at least 1 hour (allowing for the NTP server maintenance)
- **Hands position control:** this parameter enables detection of faults in the position of the clock hands (absent alarm on the sweep second movement).
- **Reboot:** this parameter enables detection of clock reboot.

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- **Temperature:** this parameter enables reporting of high or low temperature threshold breaches (variable temperature range).
- **Periodic Status:** this parameter enables periodic sending (configurable interval) of an alarm to indicate to the SNMP Manager that the clock is still «alive». The alarm consists of the clock's status.

Information: the errors or faults reported are minor and do not in themselves require a visit by a maintenance technician to correct the fault.

Warning: the errors or faults reported are serious and require a visit by a maintenance technician to correct the fault.

The Save button saves the configuration data entered.

The Send status trap button sends a status trap to all configured SNMP Managers in order to confirm that monitoring has been correctly configured.

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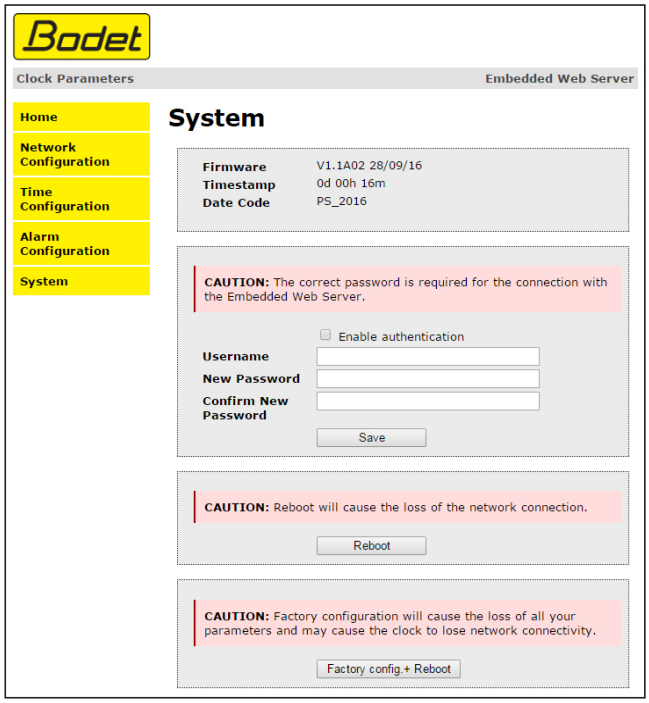
> System page



This page is divided into four parts as follows:

1st part: information panel displaying software version (firmware), time since the clock was powered on and the date of manufacture of the product (year/week).

2nd part: a warning message reminds you that once a password is set, a connection can only be established with the clock's web interface by entering the correct password. Enter a username and password in the fields provided. To save the new username and password, click on Save.

3rd part: a warning message reminds you that rebooting the clock will cause the network connection to be lost until the clock has fully rebooted.

4th part: a warning message reminds you that rebooting the clock in factory configuration will erase any settings you have made and may cause the clock to lose its connection to the network if there is no DHCP server. The Factory config.+Reboot button returns to the configuration Factory network settings.

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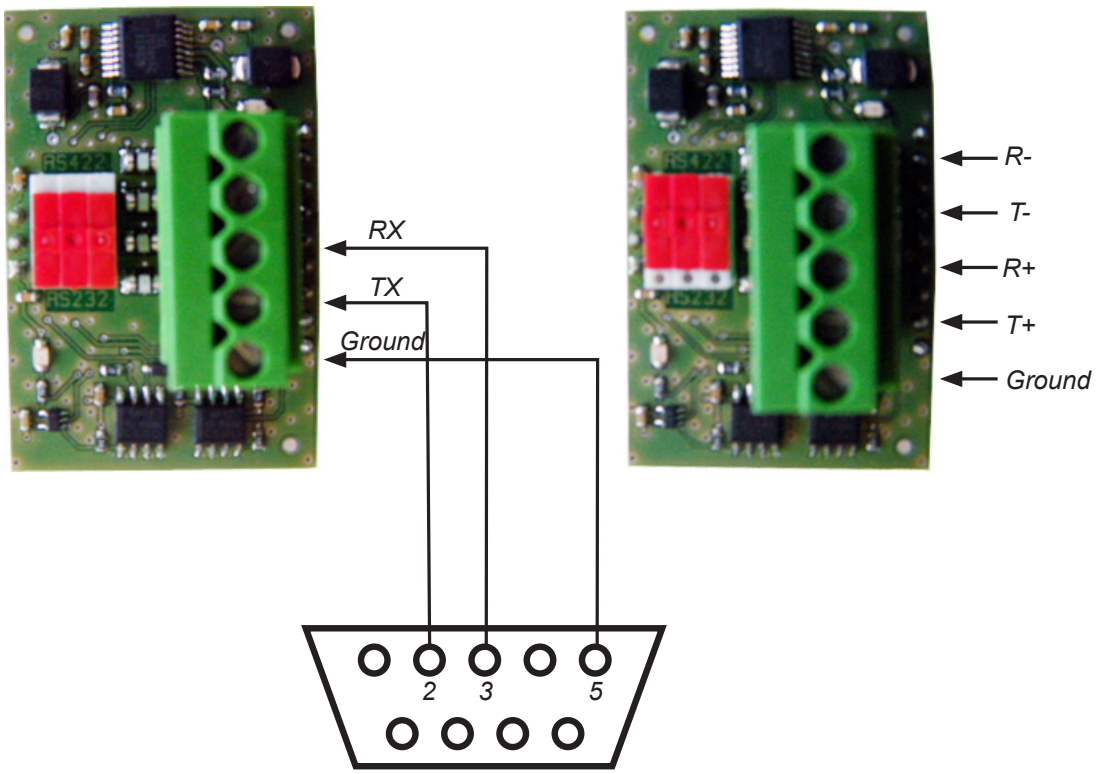
III.9 Installation on an RS232/RS422 ASCII network

For an ASCII network, there are two possible choices: RS232 and RS422.
For RS232, all the DIP switches are down.
For RS422, all the DIP switches are up.
Connect the cable as shown in the diagram below.



Nota : Do not forget to select F into the prog/alternate menu in order to validate and display datas received from the card.

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III.10 Installation of the temperature/humidity probe

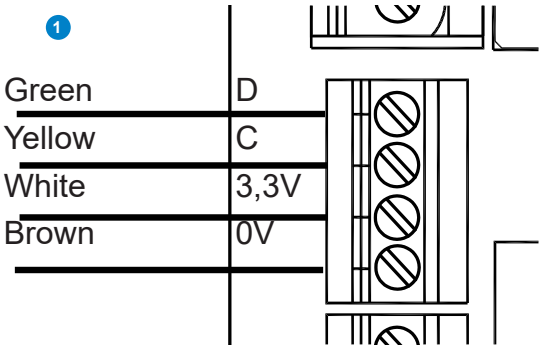
The probe must be fixed with its support in a ventilated place, sheltered from sun exposure and rain (outdoor use).

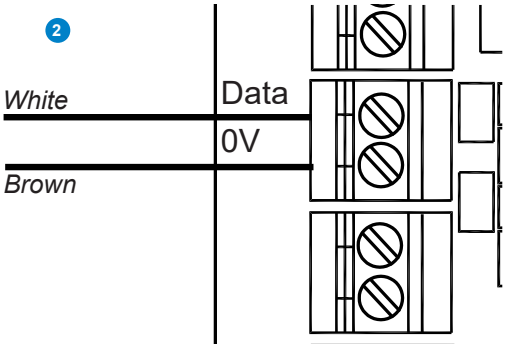
Avoid building outside walls, power sources, metallic structures, electrical interference and very windy places.

According to the place, it might be necessary to adjust the measured values. If necessary use an accurate thermometer/hygrometer to adjust the offset from the TECH menu (page 37).

HMT-HMS Led 10

HMT-HMS Led 15, 20, 25 and 45

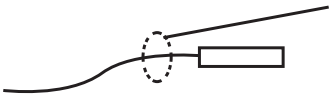




III.11 Installation of hard-wired temperature sensor

Attach the temperature sensor in a well-ventilated place sheltered from sunlight and rain (for outdoor installation). The position of the sensor must be carefully chosen to ensure correct temperature reading.

Avoid external walls, heat sources, metal parts and draughts (for further information, refer to the meteorological standards).



Air temperature sensor attachment point. If possible, avoid placing the resin part in contact to prevent thermal conduction.

The sensor is set in the factory to 20°C. It may be necessary to adjust this setting in accordance with the length of the cable (30 metres maximum):

- Place an accurate thermometer near the sensor.
- Adjust the temperature if necessary using the correction in the TECH menu (page 37).

Connect the sensor to the terminal strip (B) of the electronics board.

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III.12 Installation of HF temperature sensor

The HF temperature sensor should be installed in a place which is free from electrical interference and as high as possible. In no case must the HF temperature sensor be attached directly against a metal wall or reinforced concrete. Positions near computers or fluorescent tubes should preferably be avoided.

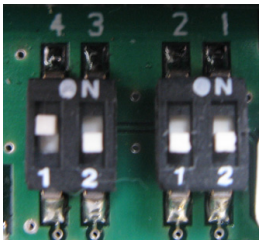
The temperature measurement must be made in a well-ventilated place away from direct sunlight. The range of the signal is approximately 150 metres (in a free field). The sensor must be slightly out of the box (see photograph opposite).

It is recommended to test the HF link before attaching the temperature sensor. Position the plug and the stud before engaging it in the casing. The sensor must imperatively be pointing downwards for obvious waterproofing reasons.

By default, the HMT LED clock and the transmitting sensor are configured on channel 1. If necessary change channels by adjusting the position of the DIP switches on the sensor, in accordance with the channel selected on the clock, complying with the following table:

Dip 4	Dip 3	Dip 2	Dip 1	Chanel HT Led
off	off	off	on	1
off	off	on	off	2
off	off	on	on	3
off	on	off	off	4
off	on	off	on	5
off	on	on	off	6
off	on	on	on	7
on	off	off	off	8

The channel of the receiver clock is configured in the TECH menu (see page 37)



1. Insert the 3 batteries (type LR6), making sure they are the right way round, or for the mains version plug the jack plug in under the central battery.

Caution: do not use the mains version of the HF temperature sensor outdoors.

2. Check that the LED inside the HF sensor flashes on each transmission, on average every 15 seconds.

If the receiver is correctly configured, the temperature should be displayed.

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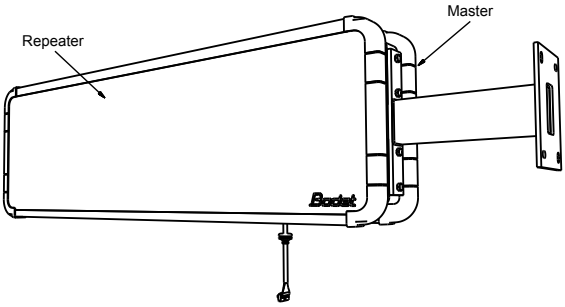
III.13 Repeater for double sided clock

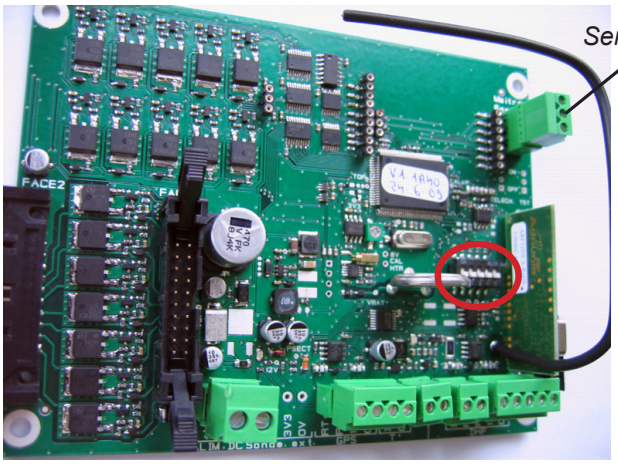
Remove a cable gland M20 on the master unit, pass the connector of the repeater through the hole and put the cable gland back. Plug the connector of the repeater in the socket (E) of the master unit card (see “III - Electrical installation”, page 9).



III.14 Configuration of DIP switches

The DIP switches are set in the factory, but it may be useful when installing several HMT clocks in series to configure DIP switches 3 to 5.

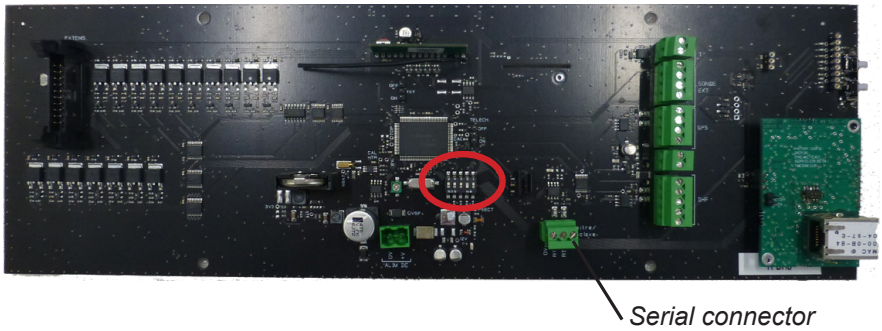
HMT-HMS Led 15, 20, 25 and 45



Clock type	Dip 1	Dip 2
HMT LED	0	0
HMS LED	0	1

Clock		Dip 3	Dip 4	Dip 5
MASTER	HMT LED	0	0	0
	HMS LED	0	0	0
SLAVE	Slave 1	0	0	1
	Slave 2	0	1	0
	Slave 3	0	1	1
	Slave 4	1	0	0
	Slave 5	1	0	1
	Slave 6	1	1	0
	Slave 7	1	1	1

HMT-HMS Led 10



III.15 Clocks in series

It is possible to connect up to 8 clocks in a serial link.

- Use the DIP switches to program one clock as the master then all the others as slaves (with a different slave number for each clock). See table above.
- Connect the serial cable on the serial connector of each clock. See photograph above.

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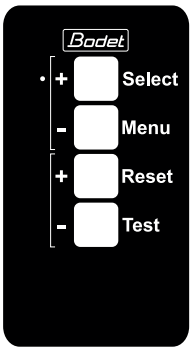
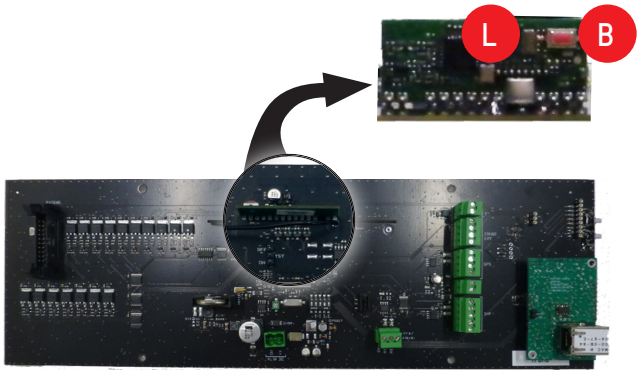
III.16 Pairing the HF remote control

From the remote control:

Models of remote control units	Procedures
	The pairing is accomplished when the clock is powered on during a limited duration 30 seconds. 1- Press the *[T]* key for at least 1 second: 88 is then displayed on the clock. The unpairing of a remote control is accomplished in the same manner. *Note: every time a clock is powered on, an already paired remote control is inactive during 30 seconds.*
	1- Turn off the power of the clock twice while the clock is displaying “Lo” in order to put the LoRa receiver in the “pairing mode” 2- Turn on the power again on the clock and press any key on the remote control unit several times during the first 15 seconds when the clock displays “Lo”, for example press 5 times the “Menu” key. 3- When the “Lo” display disappears check that the remote control is paired with the clock by pressing the key “Menu” to enter a menu To pair several remote control units or in case of failure repeat rigorously the steps 1, 2 and 3 of the above procedure. Nota: every time a clock is turned on, the already paired remote control unit is inactive during the first 15 seconds of the “Lo” display.

From the LoRa module (present on the electronic card of the clock):



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Pairing

1) Briefly press the push-button B of the receiver.
2) Observe the flashing of the red LED L of the receiver.
3) Press any key of the remote control unit.
4) Observe the red LED L of the receiver remaining ON for several seconds before going OFF.
5) The remote control unit is now paired.

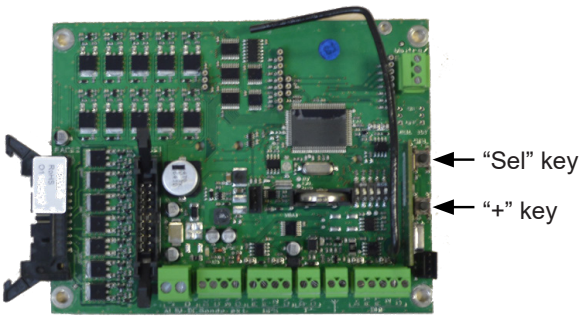
Disabling the remote control units

WARNING: the deactivation applies to all the remote control units paired to the receiver. It is impossible to dissociate the deactivation for each individual remote control units. t

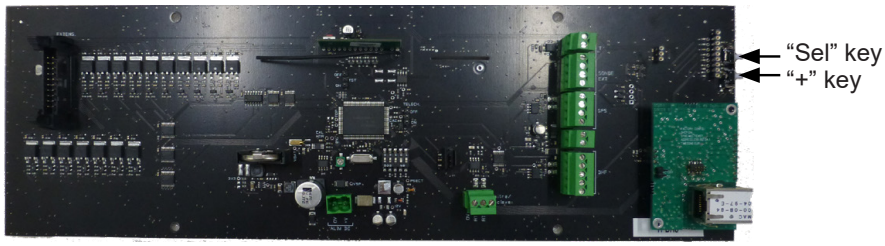
1) Briefly press the push-button B of the receiver.
2) Press the push-button B of the receiver until the red LED L of the receiver goes off.
3) Observe the red LED L of the receiver flashing during few seconds before going off.
4) The remote control units are no longer associated with this receiver.

III.17 Identification of the electronic cards.

HMT-HMS 15 20 25 45



HMT-HMS Led 10



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IV - Settings menu

[Sel] pushbutton (inside clock only)

- Long press to access the programming menu (Time/Prog/Tech/Test).
- When in a menu, long press to exit from the menu.
- Short press to validate the previously selected menu or parameter.

[Select] pushbutton (HF remote control only)

- Press briefly to validate either the menu or the previously selected parameter.
- In timing mode, press to start the chronometer and press again to stop it.

[Reset] pushbutton

- Short press to select the next menu or parameter.
- In timing mode, press to reset the chronometer when it is stopped.
- Hold down to access a value programming menu.

[Menu] pushbutton

- Hold down to access the programming menu (chrono / time / info/ prog / tech / test).
- In a menu, press briefly to exit from the menu.

[Test] pushbutton

- Hold down (for 1 s) to perform a display test and display the EPROM version number.

General information on console and board buttons

- If no button is pressed for 30 seconds when entering data, the menu is exited automatically without validating any modified parameter. A parameter is not validated until the [Select] button is pressed.

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IV.1 Main menu

The main menu allows you to access all the HMT Led readout adjustment functions. It contains 6 menus (the CHRO and INFO menus exist only with the HF remote control) :

CHRO : used to program the timing functions.

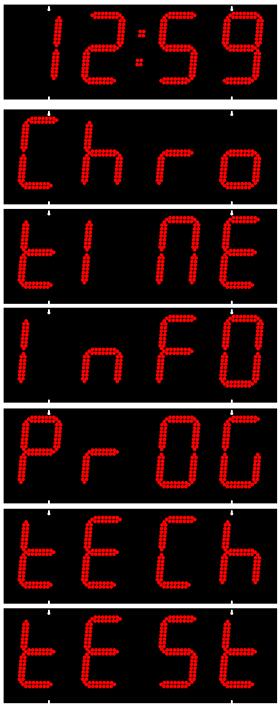
TIME : to set the time and date.

INFO : used to enter the chlorine and Ph values directly.

PROG : to adjust the LED brightness level on the display unit, or specify the information to be alternated on the display unit.

TECH : used to select 12 or 24-hour display mode, select the order of display of the month and day (31.12 or 12.31), program the time synchronisation mode, set the time difference and summer/winter time change options, modify the time base, select the temperature unit (Celsius or Fahrenheit), select the temperature display mode, add an offset value to the temperature and humidity and, lastly, select the HF transmitter channel. ***Caution : This menu is intended to be used by technicians only.***

TEST : to test the display unit to check that each LED operates correctly and to display the EPROM version number.



1. The display unit is in rest mode, displaying the time, temperature or date. Press the [M] on the console (or press [Sel] button for 1 second).
2. The first menu to appear is the CHRO menu. To go to the next menu, press the [R] button.
3. Press [S] to validate the choice of menu. Otherwise, press [M] to exit from the programming menu (or press [Sel] button for 1 second).

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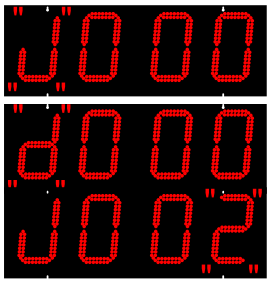
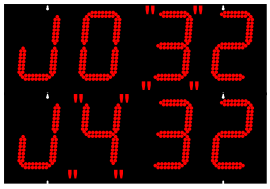
IV.2 CHRO menu: count-up and count-down setting

1. Enter the CHRO menu (see page 30).
2. A message flashes (“up”, “down”, “day up” or “day down”). Modify with the [R] button.
   “Up” starts timing in count-up mode,
   “down” starts timing in count-down mode and “day” starts a countdown in days.
   day down starts timing in count-down mode in days,
   day up starts timing in count-up mode in days, (the counting will stop on the last day at midnight).
3. Press the [S] button to validate the selection.
4. If you select Up or Down: choose between HM (count-up or count-down in Hours and Minutes: 99 h 59 m maximum) or MS (count-up or count-down in Minutes and Seconds: 59 m 59 s maximum) with the [R] button. Press the [S] button to validate the selection.
   a. If HM: enter the hours with the [R] button. Press the [S] button to validate. Then enter the minutes with the [R] button.
   Press the [S] button to validate.
   b. If MS: enter the minutes with the [R] button. Press the [S] button to validate. Then enter the seconds with the [R] button. Press the [S] button to validate.

Note: the value entered corresponds to the maximum value to be reached in count-up mode and to the initial value in count-down mode.



5. If you select Day:
   a. Choose between J (“jour” in French), d (“day” in English) and t (“tage” in German) with the [R] button. Press the [S] button to validate the selection.
   To enter the number of days to be counted down or up (maximum 999) (for example 432)
   b. First enter the unit of days with the [R] button. Press the [S] button to validate.
   c. Enter the tens of days with the [R] button. Press the [S] button to validate.
   d. Enter the hundreds of days with the [R] button. Press the [S] button to validate.



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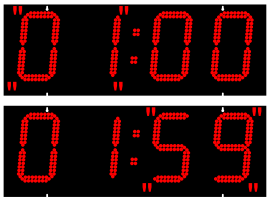
6. If you chose day countdown (day down):



You enter the time to stop the count down on the last day (entering 00:00 will stop the countdown at midnight on the last day).

The hours blink (0 to 23). Select with the [R] key.
Press [S] to validate the hour and move on to select the minutes.
The minutes blink (0 to 59). Select with the [R] key.
Press [S] to validate.

Note : During the last day the countdown changes to Hour/Min countdown. During the last hour, the countdown changes to Min/Sec countdown.

7. The readout returns to normal mode with the chronometer taken into account (*) (see “[Sel] push button (inside clock only)” on page 32 for the functioning of the chronometer).

(*) You must not forget to program the alternation of the timing using the PROG menu (see page 32).

By selecting the “ Chro “ menu and validating the “Up” or “Down” selection all the possible programmed alternating displays will be blocked. Only the timer is active. By selecting “dAy”, the alternating displays operate normally except in the case of “DAYd” when the Day countdown becomes “HMS” countdown then only the countdown is displayed. In order to exit from the display of the countdown or up, just enter the “TIME” menu.

IV.3 TIME menu : setting the time and date

1. Enter the TIME menu (see page 30).
2. The hours blink (0 to 23). Modify with the [R] button.
3. Press the [S] button to validate the hours and to go on to the adjustment of the minutes.
4. The minutes blink (0 to 59). Modify with the [R] button.
5. Press the [S] button to validate the minutes and to go on to the adjustment of the year. The «seconds signal» (seconds at 00) starts when the [S] button is released.
6. The year blinks (2000 to 2099). Modify with the [R] button.
7. Press the [S] button to validate the year and to go on to the adjustment of the number of the day in the month.

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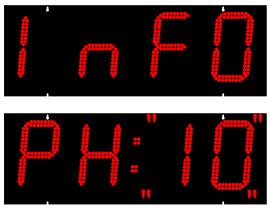
8. The number for the day of the month blinks (from 0 to 31). Modify with the [R] button.
9. Press the [S] button to validate the number and to go on to the adjustment of the number for the month.
10. The number for the month blinks (0 to 12). Modify with the [R] button.
11. Press the [S] button to validate the number for the month. The display returns to normal mode with the newly modified time and date.

IV.4 INFO menu: setting of chlorine and humidity values

This menu can be accessed only with the HF remote control.



1. Go to the INFO menu (see page 30).
2. The Ph level value flashes (0 to 14). Modify with the [R] button.
3. Press the [S] button to validate.
4. The chlorine level value flashes (01 to 99). Modify with the [R] button.
5. Press the [S] button to validate. The readout returns to normal mode.

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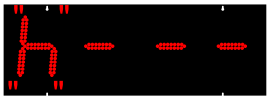
IV.5 PROG menu: brightness, temperature and alternation setting

1. Go to the PROG menu (see page 30).

2. The brightness value flashes (A1 to A3 and then M1 to M9). Modify with the [R] button. The values from A1 to A3 are automatic brightness settings (the brightness of the clock varies according to the ambient lighting). The values from M1 to M9 are manual brightness settings (the brightness of the clock is fixed whatever the ambient lighting). ***The brightness of the readout is modified in real time and managed independently per face.***

3. Press the [S] button to validate the brightness and move on to setting of the first alternation parameter.

4. The first alternation parameter flashes (h, t, d, o, u, P, c, F or -)*. Modify with the [R] button.



5. Press the [S] button to validate the parameter and move on to setting of the second alternation parameter.

6. The second alternation parameter flashes (h, t, d, o, u, P, c, F or -)*. Modify with the [R] button.

7. Press the [S] button to validate the parameter and move on to setting of the third alternation parameter.

8. The third alternation parameter flashes (h, t, d, o, u, P, c, F or -)*. Modify with the [R] button.

9. Press the [S] button to validate the parameter and move on to setting of the last alternation parameter.

10. The last parameter flashes (h, t, d, o, u, P, c, F or -)*. Modify with the [R] button.

11. Press the [S] button to validate the parameter and move on to setting of the alternation period.

12. The alternation period between the items of information flashes (2 to 6 seconds). Modify with the [R] button.

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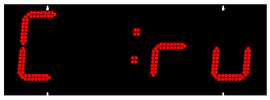
13. Press the [S] button to validate the alternation period.
14. If a « Chrono » alternating displayed is programmed in mode “up” or “down, you must now configure the operating mode.
    «ru» = run, the timer never stops. At the end of the count “up“ or “down”, the timer restarts with the programmed set value.
    «St» = stop, the timer stops at the end of the count up or countdown.



15. Select with [R] key. Press [S] to validate the operating mode of the timer.
16. The program gives you the choice of using an end-of-count relay.
    «-» = the relay will not be activated,
    «1» to « 9 » = time in sec during which the relay will be activated.
17. Select with the [R] key. Press [S] to validate the operating mode of the relay.
18. The readout returns to normal mode.

(*) h = time display

t = temperature

d = date

o = chlorine display

u = humidity display

c = count-up or count-down display (If selected, disables all alternating displays except when counting up or down in days)

F = numerical value fixed or programmed by PC (serial link)

P = Ph display

- = none.

Example of setting “ h t d _ ”: display of time then temperature then date and return to time. If “ - ” is selected, switching to next item of information (no blank display). Repetition of a letter doubles the display time.

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IV.6 TECH menu : technician

1. Enter the TECH menu (see page 30).

2. The 24 (or 12) hour clock time display mode blinks. Modify with the [R] button.

3. Press the [S] button to validate the mode and to go on to the adjustment of the day/month order.

4. The day/month or month/day order blinks. Modify with the [R] button.

5. Press the [S] button to validate the order and to go on to the selection of synchronisation mode.

6. The synchronisation mode flashes (Independent “Ind”, Radio “rAd”, GPS “GPS”, AFNOR “AFn”, Minute “Min”, 1/2 minute “1:2M”, DHF “dHF” or NTP “ntP” (see page 31 for further explanations on each type of time distribution). Modify with the [R] button.

7. Press the [S] button to validate the synchronisation mode.

8. If you select ntPU, going into dynamic mode: waiting for time signal (display: «--:--») and then display the time:

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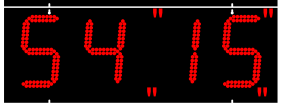
9. If you select ntP, program the end of the multicast address 239.192.xxx.nnn. Select the address between Bodet (49) and other (54). Modify with the [R] button.

   a. Press the [S] button to validate.

   b. Select the end of the multicast address (0 to 15). Modify with the [R] button.

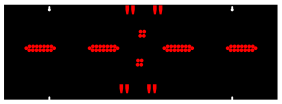


   c. Press the [S] button to validate.

10. If you select dHF or AFn, choose between COd (unadjusted time signal) or LOC (time signal + summer/ winter time change + time zone). Modify with the [R] button. Press the [S] button to validate.

11. If you select dHF, choose between “Init” (go to Init on first installation of the clock) (see page 37) or “nor” (mode normal). Modify with the [R] button. Press the [S] button to validate. Validation of INIT mode leads to return to the idle display with alternate display of INIT and 00:00 until DHF reception is obtained.

12. If rAd, GPS, AFn, dFH or ntP is selected, dynamic reception of the time is displayed and constructed. ***If Ind, Min or 1:2M is selected, this menu does not appear.***



13. Press the [S] button to validate dynamic reception and to go on to the adjustment of time differences.

14. Choose a pre-recorded zone for time differences and summer/winter time changes or choose programmable mode (Prog) with the [R] button. ***If Ind, Min or 1:2M is selected, this menu does not appear.***

   Central Europe zone “Eur” (France, Germany, etc.) (GMT +01 hour).
   Winter to summer time = last Sunday in March at 2 a.m.
   Summer to winter time = last Sunday in October at 3 a.m.

   Western Europe zone “Eu_1” (Great Britain, Portugal, Republic of Ireland) (GMT +00 hour).
   Winter to summer time = last Sunday in March at 1 a.m.
   Summer to winter time = last Sunday in October at 2 a.m.

   Eastern Europe zone “EASt” (Greece, Finland, etc.) (GMT +02 hours).
   Winter to summer time = last Sunday in March at 3 a.m.
   Summer to winter time = last Sunday in October at 4 a.m.

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USA Eastern zone “USAE” (New York, Toronto, etc.) (GMT -05 hours).
Winter to summer time = second Sunday in March at 2 a.m.
Summer to winter time = first Sunday in November at 2 a.m.

USA Central zone “USAC” (Chicago) (GMT -06 hours).
Winter to summer time = second Sunday in March at 2 a.m.
Summer to winter time = first Sunday in November at 2 a.m.

USA Mountain zone “USAM” (Denver) (GMT -07 hours).
Winter to summer time = second Sunday in March at 2 a.m.
Summer to winter time = first Sunday in November at 2 a.m.

USA Pacific zone “USAP” (Los Angeles) (GMT -08 hours).
Winter to summer time = second Sunday in March at 2 a.m.
Summer to winter time = first Sunday in November at 2 a.m.

Australia zone “AUS” (Sydney) (GMT +10 hours).
Winter to summer time = firsr Sunday in October at 2 a.m.
Summer to winter time = first Sunday in April at 3 a.m.

«GMt» programmable mode : mode to enter the time difference only. No summer/winter time change is possible.

a. If GMT is selected, press the [S] button to validate.
b. The time difference hours blink (from -11 h to +11 h). Modify with the [R] button.

c. Validate the time difference with the [S] button.
d. The minutes for the time difference blink (00 or 30). Modify with the [R] button.

e. Validate the time difference with the [S] button.

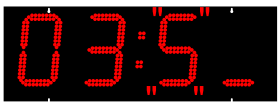
«PrG» programmable mode : mode to enter summer/winter and winter/summer time change dates and time difference.

a. If the «PrG» menu is chosen, press the [S] button to validate.
b. The number of the month for the winter/summer time change blinks. Modify with the [R] button.

c. Validate the month with the [S] button.
d. The third figure, corresponding to the day in the month for the winter/summer time change blinks.

If the date is not fixed :

- Modify the third figure, corresponding to the number of the week in the month (from 1 to 5) with the [R] button. Validate with [S].



- Modify the fourth figure, corresponding to the number of the day in the week (from 1 to 7 : 1 Monday and 7 Sunday) with the [R] button. Validate with [S].

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If the date is fixed :

- Select F for the third figure with the [R] button. Validate with [S].
- Enter the number of the day in the month (from 1 to 31) with the [R] button. Validate with [S].

e. The number of the month for the summer/winter time change blinks. Modify with the [R] button.

f. Validate the month with the [S] button.

g. The third figure, corresponding to the day in the month for the summer/winter time change, blinks.

If the date is not fixed :

- Modify the third figure, corresponding to the number of the week in the month (from 1 to 5) with the [R] button. Validate with [S].
- Modify the fourth figure, corresponding to the number of the day in the week (from 1 to 7 : 1 Monday and 7 Sunday) with the [R] button. Validate with [S].

If the date is fixed :

- Select F for the third figure with the [R] button. Validate with [S].
- Enter the number of the day in the month (from 1 to 31) with the [R] button. Validate with [S].

h. The hours of time difference blink. Modify with the [R] button (from -11 h to +11 h). Validate with the [S] button.

j. The minutes blink. Modify with the [R] button (00 or 30). Validate with the [S] button.

14. The time base correction value blinks (in steps of 50 ms). Modify with the [R] button. **The time difference is taken into account whatever synchronisation mode is used (including radio).**

15. Press the [S] button to validate the difference and to go on to the choice of synchronisation temperature unit.

16. The temperature unit, either degrees Celsius «C» or Fahrenheit «F», blinks. Modify with the [R] button.
The selection can causes a modification of the display of the digits «6» and «9». If «Fahrenheit», the 6 and 9 will be displayed in the American format.

17. Press the [S] button to validate the temperature unit and select the exactness of the temperature (degrees, tenths of a degree, 0,2° or 0,5°). Modify with the [R] button.

18. Press the [S] button to validate and move on to setting of the correction to be made to the temperature reading.

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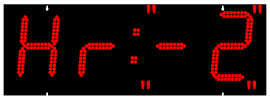
19. The t flashes (t or - for a negative correction). Modify with the [R] button.
20. Press the [S] button to validate and move on to setting of the degrees of the temperature correction.
21. The figure flashes (0 to 9). Modify with the [R] button.
22. Press the [S] button to validate and move on to setting of the tenths of a degree of the temperature correction.
23. The figure flashes (0 to 9). Modify with the [R] button.
24. Press the [S] button to validate.
25. Select the channel (1 to 8 or none) of the HF transmitter on which synchronisation is required. Enter the same number as in the HF temperature box. The value – deactivates the HF temperature function. Modify with the [R] button.
26. Press the [S] button to validate the temperature unit and move on to setting of the correction to be made to the humidity reading.
27. The figure flashes (-9 to +9). Modify with the [R] button.
28. Press the [S] button to validate. The display returns to normal mode.



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IV.7 TEST menu : test and version display

1. Enter the TEST menu (see page 30).

2. All the LEDs should light up.

3. Press the [S] or [T] to go on to the next test.
4. All the LEDs should go out.

5. Press the [S] or [T] button to display the version.
6. Display of addressing number of each module (the “3-dot” module remains unlit). The number normally corresponds to the example on the right.

7. Display the soft version number.

8. Press the [S] or [T] to return to normal mode.

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IV.8 Displaying a numerical value

A numerical value can be displayed by selecting alternation “F” in manual mode or via a PC serial link.

Note: if both input modes are used (manual and via serial link), the value actually displayed will always be the last value entered.

Note 2: additional instructions are enclosed in the packaging for entering values via a PC serial link.

1. Press the [R] button for 3 seconds to go to the numerical value menu.
2. The first digit flashes; modify with the [R] button.
3. Press the [S] button to validate and move on to the second digit.
4. The second digit flashes; modify with the [R] button.
5. Press [S] again to validate and move on to the center Led module.
6. The module blinks, select « : », « . » or « » with the [R] key.
7. Press the [S] button to validate and move on to the fourth digit.
6. The third digit flashes; modify with the [R] button.
7. Press the [S] button to validate and move on to the fourth digit.
8. The fourth digit flashes; modify with the [R] button.
9. Press the [S] button to validate. The readout returns to normal mode.

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V - Types of time synchronisation

Independent mode “Ind”

- The clock is totally independent; it receives the time information from its own time base.

DCF radio-synchronised mode “rAd”

- The clock is independent; it receives the time information from its time base which is corrected in the event of deviation by comparing it with the signal from the DCF transmitter.
- Radio synchronisation enables the time to be displayed with absolute precision.

GPS mode “GPS”

- The clock is independent; it receives the time information from its time base which is corrected in the event of deviation by comparing it with the signal from the GPS transmitter.
- GPS synchronisation enables the time to be displayed with absolute precision.

AFNOR mode “AFn”

- Coded time distribution consists in transmitting a complete time message every second: setting of these receivers to the right time is carried out automatically and rapidly on connection on the clock line.
- The AFNOR code does not transmit interference and is not affected by other electrical interference.

24V parrallel minute or 1/2 minute

- The receiver clocks are connected in parallel to a distribution line and activated by means of electrical impulses transmitted every minute or 1/2 minute by the master clock.

Series ½ minute impulse receiver mode “1:2M”

- The receiver clocks are connected in series to a distribution line and activated by means of electrical impulses transmitted every ½ minute by the master clock.

DHF mode “dHF”

- The clock is radio-synchronised by a DHF radio transmitter.

NTP mode “ntP”

- An SNTP server periodically transmits the UTC time on the Ethernet network. The receiver clocks automatically set themselves to the right time after receiving several coherent time messages and applying the time zone configuration. The NTP server must have a transmission (Poll) period of less than 128 seconds.

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VI - Technical features

Designation	Features
Power supply	115V / 230V +/-6% 50/60Hz
Rated current : HMT Led 45 master HMT Led 25 master HMT Led 20 master HMT Led 15 master HMT Led 10 master HMT Led 25 master + repeater HMT Led 20 master + repeater HMT Led 15 master + repeater HMT Led 10 master + repeater HMS Led 10 HMS Led 15 HMS Led 25 HMS Led 45	 0.8A / 0.4A 0.5A / 0.25A 0.37A / 0.2A 0.30A / 0.15A 0.20A / 0.10A 0.60A / 0.35A 0.55A / 0.30A 0.50A / 0.25A 0.35A / 0.20A 0.20A / 0.10A 0.55A / 0.30A 0.75A / 0.40A 1.45A / 0.75A
Earthing system	TT, TN or IT
Electrical insulation	Class I
Mains supply terminal block	3 terminals E, N and L from 0.75² to 2.5²
DCF input	4-20 mA current loop ; 50 mA limitation
HF remote control frequency / Coverage distance	433,92 MHz / maximum 100 m in open area
Cable gland dimensions	Mains supply : M23 - sheath Ø 10 to 14 mm Repeater or mains supply : M20 - sheath Ø 7 to 10 mm Temperature probe : M12 - sheath Ø 3 to 5 mm DCF antenna : M12 - sheath Ø 3 to 5 mm
Backup of parameters in the event of a mains power failure	Permanent
Operating temperature	-20°C to +50°C
Protection index	IP 54 / IK 07
Time base accuracy	≤ 0,2 sec/day

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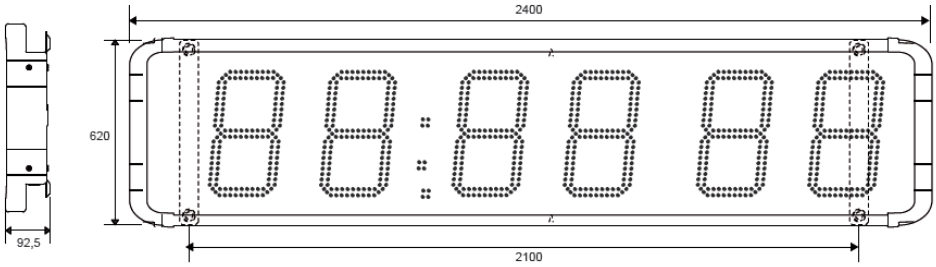
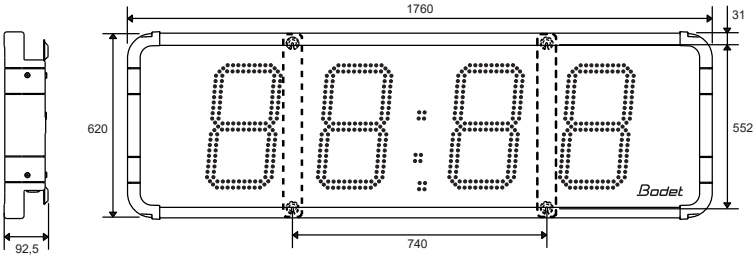
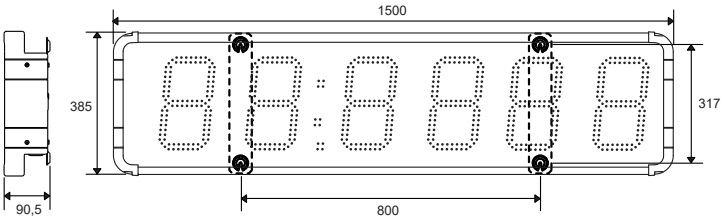
HMS LED 45



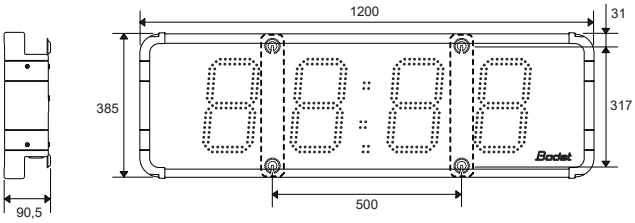
HMT LED 45



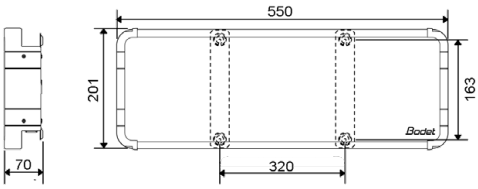
HMS LED 25



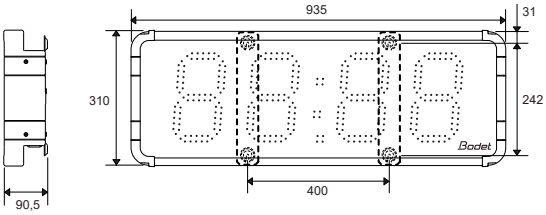
HMT LED 25



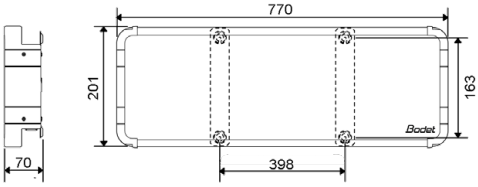
HMT LED 10



HMT LED 15/20 HMS LED 15



HMS LED 10



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