SIGMA H

Installation and start-up instructions

Bodet

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AFAQ ISO 9001

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Check the product for shipping damage on reception for any reservations to the carrier

Table of contents

1) General

The Sigma is a master clock which can be used to control receiver clocks.

The SIGMA has functions which can be programmed from the technician menu.
On first installation, it is essential to program the technician menu (see page 14) before the customer menu.
It is also essential when installing the SIGMA to program the technician functions in the order in which they appear in the menu.

This product must be installed in a residential, commercial or light industry environment.
Bodet declines all responsibility in the event of an accident resulting from use not in accordance with the recommendations of this manual.

CAUTION :
Any modification on the product renders the guarantee null and void.

Checking the equipment:

One SIGMA master clock.
This instruction manual.

To verify the model of the master clock, press the ✓ key.

2) Safety rules

- **Maintenance of this equipment must be carried out by qualified personnel.**

- If the SIGMA is connected to the 230 V mains power supply, its installation must comply with the European standard IEC 364 (NFC 15.100 for France).

PROTECTIONS :

- 110-230V version: the mains supply for this device must include a neutral phase circuit breaker of maximum 6 A C curve, rapidly accessible upstream from the supply.

- 24V DC version: the SELV 24 V power supply for this device must include a protection of maximum 6 A.

- 36-72V DC version: the SELV 36-72 V power supply (according to NFC 15-100) for this device must include a protection of maximum 6 A.

- The circuit breaker must be switched off during maintenance operation. Refer to labels in the product.

- All cables must be attached either to the wall (wall-mounted version) or to the frame of the cabinet (Rack version) before being connected to the various terminals strips, to prevent any pulling on these terminal strips. In addition, the wires of each terminal strips must be attached to each other to maintain the various isolations if an initial fault occurs.

- The time distribution cables must not run alongside high power mains cables (to avoid interference with communication between the SIGMA and the clocks).

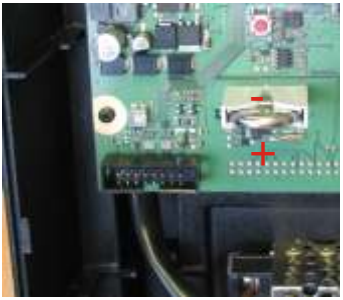
- The SIGMA must be attached (to the wall or on its support) before being switched on.

- “Rack” models must be mounted in a slide-in unit for 19” cabinets or racks. These components will provide mechanical, electrical and fire protection (only the front panel may remain accessible).

- **IMPORTANT: before any installation, refer to the “technical characteristics” paragraph.**
-

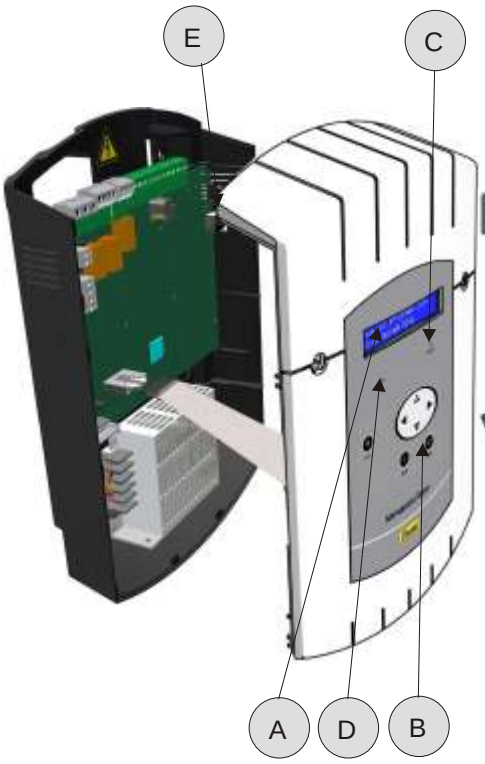
Caution :

- In case of replacement of the CR2032 battery, it is IMPERATIVE to respect the polarity following the opposite indications.
- There is risk of explosion if the battery is replaced by a battery of incorrect type.
- Dispose of used batteries according to the instructions of the manufacturer.

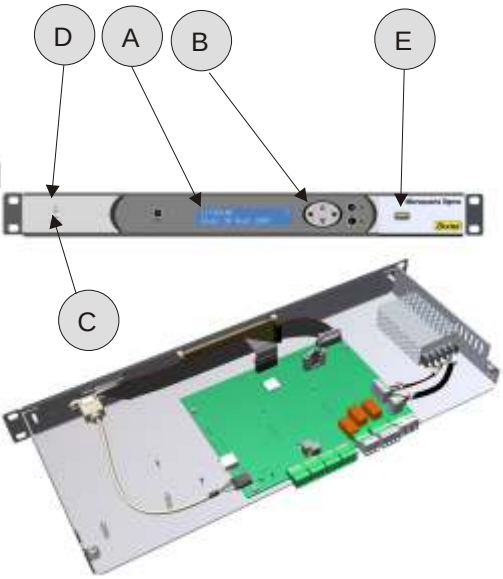


3) Description

Wall box

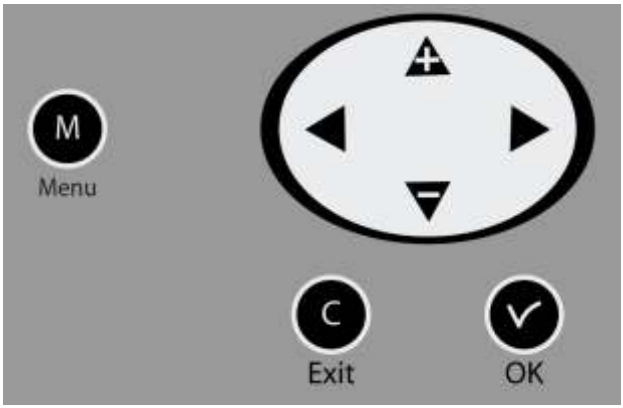


19" Rack



A) LCD screen
B) Keypad (see page 6)
C) Alarm indicator light (red LED)
D) Mains indicator light (green LED)
E) USB connector

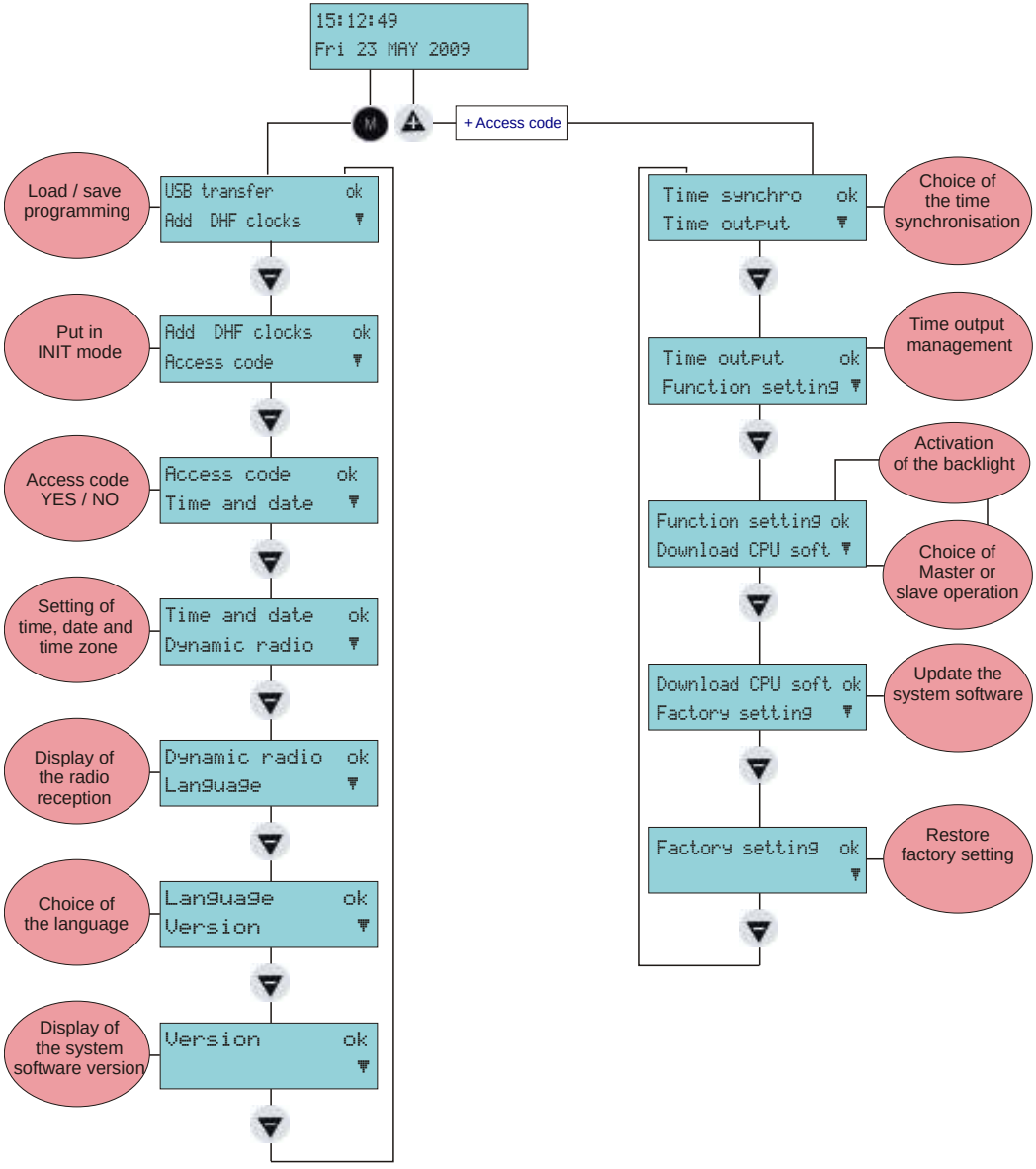
4) Keypad: Key functions



Keys	Functions
M	Menu key.
C	Correction key.
✓	Validation key.
◀ , ▶ , ▼ , ▲	Navigation keys.

Note: exit from the menus is automatic if a key has not been pressed for one minute in the customer menu or for 5 minutes in the technician menu.

Synoptic diagram of the programming



5) Main menu programming

5.1 Standby state

- In normal functioning the SIGMA displays the time and date :
  ψ is the radio signal indicator, which flashes if reception is poor.

5.2 User menu

To access the user menu, press the menu key M .
Enter the user access code if necessary (see page 11).

Access the menu options using the ▼ key and validate with ✓.

The user menu options are :

1/ USB loading and backup,
2/ Add DHF receivers,
3/ Customer menu access code,
4/ Time and date / time changeover,
5/ View dynamic reception,
6/ Language choice,
7/ System version.

5.3 USB loading and backup

The SIGMA can load or back up its programming via a USB key.

Validate the option with the key,

The following screen is displayed :

Insert the USB key and validate with the key.

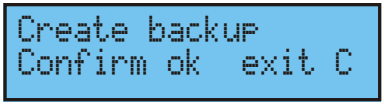
To load a Program in the Sigma :

Validate the option with the key,
The SIGMA will search for the files available on the key (.sig extension).

Select the file to be loaded using the and keys and validate with the key.
The loading is then carried out. When it is completed, the unit displays :

To back up the existing Program of the Sigma :

Validate the option with the key,



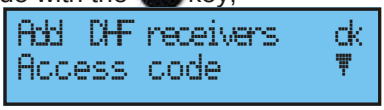
The SIGMA saves the file with an automatically allocated name in the format: sauve1_DD_MM.sig (The number (1, etc.) and the date are incremented automatically).

It is possible to rename this file from the PC, while keeping the same ".sig" extension.
Once the backup is completed, the unit displays:

5.4 Adding DHF receivers

To put the SIGMA in “DHF initialisation” mode and enable synchronisation of a new clock, validate the initialisation mode with the key,

The following screen is displayed :



Select “ACTIVE” mode using the and keys and validate with the key.

The “init” display mode will appear alternately with the normal display during this period (4 hours).

It is possible, once the receivers DHF initialized, to stop this mode in this menu.

5.5 Access code

To enter or remove the SIGMA access code, validate the option with the key,

The following screen is displayed :

Choose the option you require and validate it with the key.

The access code is fixed, , , , .

If there are 3 attempts with the wrong access code, an alarm message appears. The keyboard is locked for 10 minutes. It is possible to unlock it from the technician menu.

5.6 Time and date

To change the time or the date of the SIGMA, validate the option with the ✓ key,

The following screen is displayed :

You have access to the time zone selection.

The time zone selection allows you to automatically manage winter/summer time changeovers.

If the zone is not available in the 20 pre-programmed towns or time zones, select “PROG” mode which is programmed in the technician menu.

“PROG” mode allows you to configure personalised time zone differentials and time changeovers.

By default it is in “PROG” mode.

The hour is flashing: set the hour using the ▼ and ▲ keys and move on to the minutes with the ▶ key.

Proceed in the same way for the date.

Validate with the ✓ key. If the time has been changed, the seconds are reset to 0.

5.7 Dynamic radio reception

To view the dynamic reception of the SIGMA, validate the option with the key,

If the reception is correct, the time and date are constructed automatically.
If the SIGMA is synchronised by a GPS antenna, the time displayed is GMT.

If the SIGMA is synchronised by a France-Inter or DCF antenna, the radio time is displayed.

5.8 Language

To select the language of the SIGMA, validate the option with the key,

Select the SIGMA display language from the different options available.

The languages available are : FRENCH, ENGLISH, SPANISH, GERMAN, DUTCH, PORTUGUESE, NORWEGIAN, DANISH, ITALIAN, ...

5.9 Version

To view the version of the SIGMA, validate the option with the key,

The following screen is displayed :

6) Technician menu programming

The technician menu is accessible via an access code sent to the approved persons.

Press one of the navigation keys for a few seconds.
A code is then requested.

The technician code is a fixed code, ▲, ▶, ▼, ◀ and M.

You then have access to the technician menu with the ▼ key.

The options in the technician menu are :

1/ Time synchro,
2/ Time output and DHF management (impulses, D1 D2, Afnor, DHF) and output time zone differential,
3/ Function assignment,
4/ CPU hardware software download (.cod extension),
5/ Restore factory configuration.

Validate the selected option with ✓ key.

To exit the technician menu, use the C key.

6.1 Time synchronisation menu

To configure the time synchronisation of the SIGMA, validate the option in the technician menu with the key,
The following screen is displayed :

Select the time synchronisation mode from the following options:

FI/DCF Radio,
Minute radio (mode used for countries receiving the FI/DCF radio signal but for which the time is different from Paris/Berlin [only minute is synchronised, date and hour must be set manually]),
EXTERNAL (mode used for synchronisation from a Sigma “Master” which transmits a GPS signal simulation from an ASCII extension card),
NONE: if you choose to have no synchronisation, the radio pictogram is not displayed.
GPS,
Remark : all the synchronisation options are proposed without checking that an antenna is connected (by default, the configuration is FI/DCF mode).
In case of synchronisation input failure, an alarm message is sent. This alarm is triggered after 24 hours without synchronisation.

Select the synchronisation mode with the and keys and validate with the key.

The following screen is displayed if “Prog” mode has been validated in the customer menu (see “Time and date”, page 12) :
This menu can be used to program non-standard winter/summer time changeovers.

6.1.1 Programmable time changeover

This menu can be used to program the summer/winter time changeover dates. It allows you to define the start of the winter period and then the start of the summer period.

To program the summer/winter time changeovers, validate with the key.

- Set the start date of the winter period using the and and key.

In order:

The “Rank” flashes. The Rank designates the order number of the day of the week in the month[1] (1 to 5 depending on the month) (rank 5 always indicates the last week).

The “*day*” flashes.

The “*month*” flashes.

The “*time*” flashes.

Validate with the key.

- Set the start date of the summer period using the and and .

Validate with the key.

Whatever the synchronisation mode (radio France Inter or GPS), this forces the automatic time changeover for radio FI or DCF.

Set the start date of the winter period and then the summer period using and and keys.

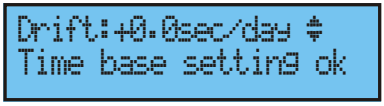
Validate with the key.

1 *Example of Rank calculation: the second Monday of the month or the second Thursday of the month have rank “2”, while the last Tuesday of June has rank “5” as there are no more than 5 weeks in a month.*

6.1.2 Setting the time base

This menu can be used to set the drift of the time base. This can be useful when the master clock has no external synchronisation.

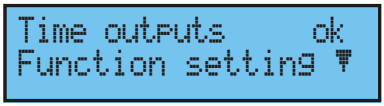
To access this menu, you need to have selected “None” mode in the external synchronisation menu.



Set the drift using the  and  keys and validate with the  key.

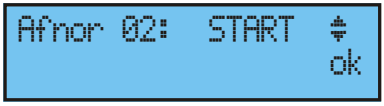
6.2 Time output management menu

This menu can be used to view all the time outputs, modify their status (Start/Stop), configure the DHF distribution in Init mode and configure the “impulse” and “D1D2" distribution.
This menu allows you also to configure the impulse output (Impuls 01) to provide TBT 24VDC (0,5A) power supply.
To go to the SIGMA time output management menu, validate the option in the technician menu with the key,



The following screen is displayed :

You can view the different options and change the values using the and keys.
You can go through the different outputs by validating using the key.



The 3 outputs (Impulse 01, Afnor 02 and DHF03) are not programmable with a time zone differential.

The placing of a DHF output in “INIT” status is active for 4 hours before return to START mode (The init mode display is alternating with the normal display during this period).

This menu can be used to set the power of the DHF output with a choice of 25mW / 125mW (by default) / 500mW and assign the system address from 1 to 4 (1 by default).

Buzzer mode allows you to activate a buzzer on the secondary transmitters in order to identify them.

For an “impulse” or “D1D2" output, the key can be used to go to the configuration menu.

Remark: the “D1D2" menu appears only if the relays have been assigned to the D1D2 distribution (see “Relay setting menu”, page 17).

Use the key to move on to the next parameter:
Choice of impulse length.

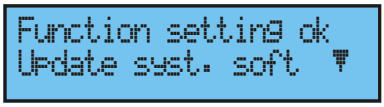
Minute 24V standard impulse length (factory configuration) of 1.2 seconds variable from 0.5 to 5 seconds,
Second 24V standard impulse length (factory configuration) of 0.3 seconds variable from 0.1 to 0.9 seconds,
D1D2 standard impulse length (factory configuration) of 6 seconds, variable from 1 to 10 seconds.

Use the key to move on to the next parameter:
Choice of status (“Start”/“Stop”).
Circuit stopping must be confirmed.

Use the key to return to the previous screen.

6.3 Function setting menu

This menu can be used to define whether the master clock functions as a master or as a secondary clock (slave).
It can also be used to activate the backlight of the display screen.
To go to the SIGMA function setting menu, validate the option in the technician menu with the ✓ key,

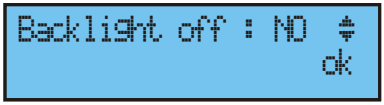


The following screen is displayed :

The master clock is configured in master mode by default.

If you configure it in “slave” mode to assign it as a secondary master clock, then the external input (see below) displays SLAVE and cannot be modified.

The following screen can be used to activate or deactivate the idle screen backlight (by default, the backlight is lit, therefore value set to No).



6.4 CPU software download menu

This menu allows you to update the system software of the master clock.
To go to this SIGMA menu, validate the option in the technician menu with the ✓ key,

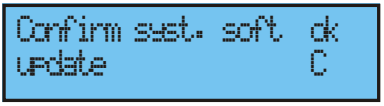
The code file (*.cod) must be on the root of a USB key and be the only “.cod” file.

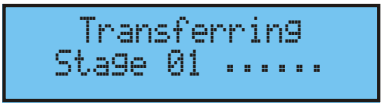
The following screen is displayed :
to download,

validate with the key,

The following screen is displayed :

validate with the key.





6.5 Factory setting restoration menu

This menu can be used to reinstall the initial factory setting.
To go to this SIGMA menu, validate the option in the technician menu with the key,

The following screen is displayed :
To reinstall the factory configuration,

validate with the key.

7) Alarm messages

By default, the alarm configuration is :

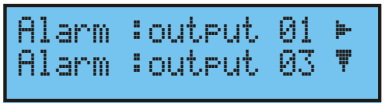
- Activated: if an alarm is present, a message is displayed on the readout,
- Alarm relay: relay 3 is activated if an alarm is triggered.

If an alarm is active, the display alternates between the date and the alarm message.

Press the ▶ key to view additional information on this alarm.
Example :

If several alarms are active simultaneously, the display is:

Press the ▶ key to view the additional information.



Press the ▼ key to view the following alarms.
The alarms are displayed in chronological order.

To acknowledge an alarm, press ✓.

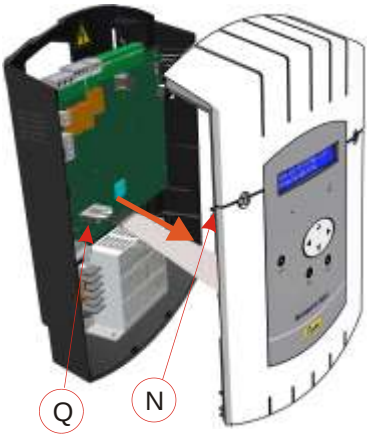
Except for FI, DCF and GPS synchronisation failures where alarm is activated after 24 hours, other alarms are activated immediately.

Alarm message	Meaning
user code fail.	The user code has been entered three times incorrectly; the keyboard is blocked for 10 minutes.
tech.code fail.	The technician code has been entered three times incorrectly; the keyboard is blocked for 10 minutes.
battery failure	The lithium battery used to save configuration data is defective; replace the battery after making a backup of configuration data.
24V bat.failure	The 24V power supply is faulty; check the 24V battery backup.
master failure	The main master clock is defective; control the main master clock. If a Sigma SWITCH is used, the stand-by master clock will automatically take over.
sync. failure	The synchronisation source is faulty. This alarm is triggered after 24 hours without synchronisation.
24V overload	The impulse line is overloaded; check the impulse line or reduce the number of clocks.
24V pulse fail.	The impulse output is defective.
Afnor failure	The AFNOR output is defective.
DHF failure	The DHF output is defective.

8) Installation

8.1 Mechanical installation

Choose a room with low temperature variations away from any source of electrical interference (contactors, motors, etc.).

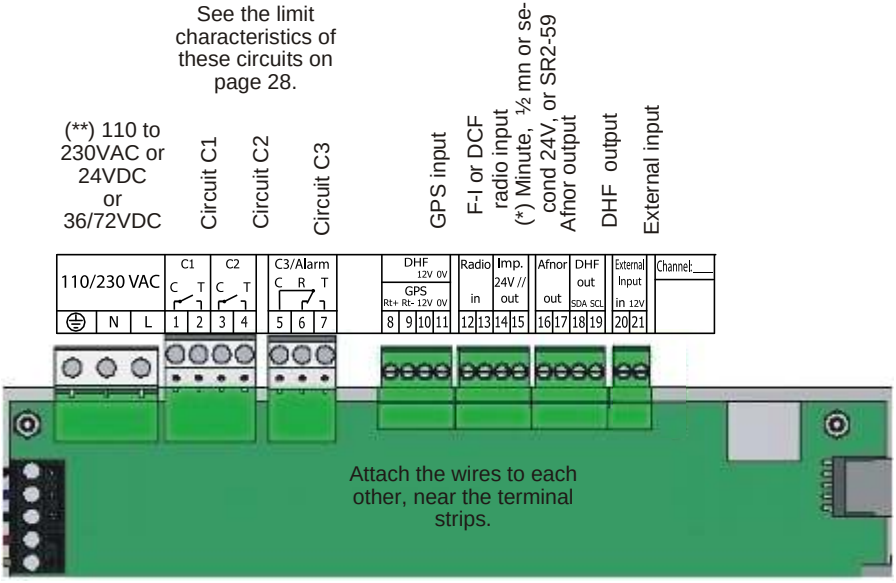


WALL-MOUNTED version: Unscrew the 2 screws on the front, remove the cover (for the lower cover, press on the 2 clips (N) and slide it upwards). Disconnect the flat jumpers (Q) (be careful to connect them the same way round on reassembly) and attach the SIGMA to the wall. When your unit is in place, remove the protective film on the keypad.

RACK version: Install the rack in its slot in an electrical bay or cabinet.

8.2 Electrical connections

Connect the cables (mains power supply, impulse line or AFNOR output and radio synchronisation input, depending on the model) to the corresponding terminal strips as shown in the figure below.

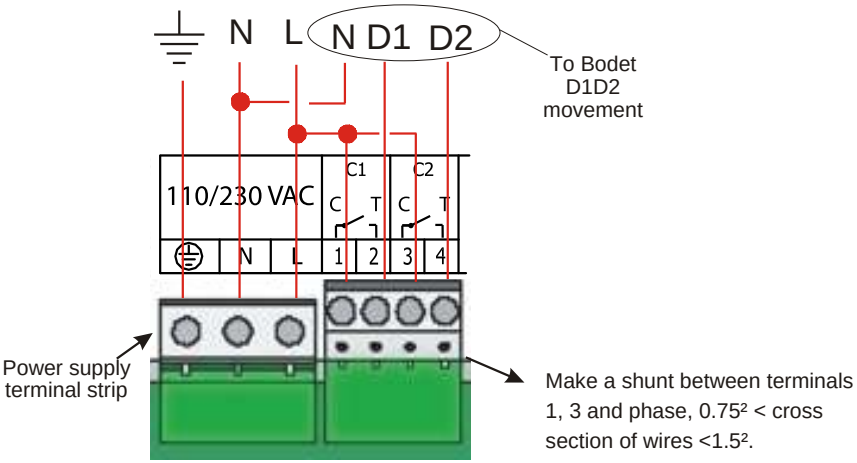


(*) See page 18, the “Time outputs” menu to set this output (Pulse minute, ½ minute, second 24V or power TBT 24VDC 0,5A).
(**) depending on the SIGMA model.

RACK version: The mains power supply, impulse line and AFNOR output and radio synchronisation input terminal strips are directly accessible at the rear of the Rack slide-in unit.

Connection for D1D2 distribution :

D1 D2 uses the relays of circuits 1 and 2

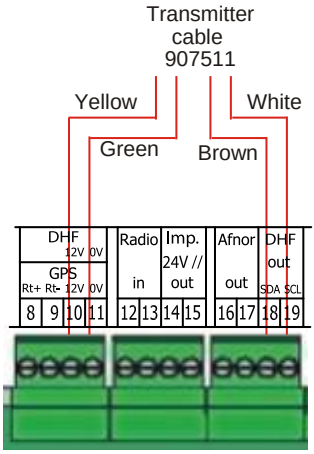


Circuits must be protected by fuse disconnector or circuit breaker 4A maximum. Indicate on the label above the terminal block the location of these protections.

Connection of DHF transmitter :

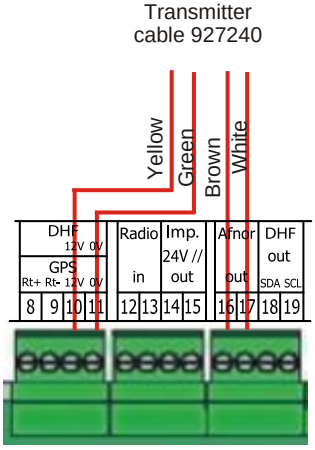
There are two types of DHF transmitters.

DHF transmitter “Time and relays”, reference 907511, for SIGMA master clocks.



DHF transmitter “Time”, reference 927240, for master clocks SIGMA, DELTA, ALFA, etc.

Note: the INIT mode must be activated directly from a DIP switch on the electronic card of this transmitter (not from the master clock).



9) Technical characteristics

	Designation	Characteristics
Electrical	Backup	Permanent backup of all parameters in case of mains failure. Automatic resetting of receiver clocks to correct time after mains restoration.
	Time base	Quartz, accuracy 0.1 seconds per day between 20 and 25°.
	Power supply	115 or 230 V AC ± 10% 50/60 Hz or 24 V DC, or 36/72VDC (depending on the model).
	Maximum consumption	25W, 50W for the model 36/72VDC.
	Mains terminals	Cross section 1.5², maximum baring 6 mm.
	Earth terminal	Rack: rigid or flexible cable with end piece with cross section 1² to 1.5² Wall-mounted: rigid wire 1² to 1.5² bared 6 mm.
	Other terminals	Cross section 1.5² maximum, bared 6 mm.
	Electrical isolation	Class 1.
	Mains power supply system	TT or TN system.
Relays	Control circuit (relay) isolation	Galvanic isolation.
	Circuit operating voltage	Either SELV* or LV** with common phase (230 V maximum between the 2 circuits).
	Relay breaking capacity	240V AC 1A.
	Usefulness of indicator light (of each circuit)	1) Lit when contact closed. 2) Used to indicate the current circuit programming.
	Types of relays	Double-throw (SPDT) on circuit 3. Normally open (SPNO) on circuits 1 and 2.

Outputs	Synchronisation	Depending on model, on FI, DCF, MSF or GPS antenna.		
	Minute or half minute parallel polarised impulse distribution	1 output 24V 0,5A, configuration in minute, ½ minute or second impulse or SR2-59 or TBT 24V power supply.		
	D1D2 distribution	One output (D1 D2 uses the relays of circuits 1 and 2).		
	AFNOR coded time distribution	One output, standard NFS 87 500A (no programming is necessary) (SELV).		
Mechanical	Protection index	Wall-mounted : IP41 / Rack : IP 20		
	Operating temperature	0 to 50°C		
	Keypad locking	By access code		
	Dimensions		WALL-MOUNTED version	19" RACK Version
		Width	220 mm	483 mm (1 width)
		Height	322 mm	44 mm (1 U)
		Depth	83 mm	200 mm
	Weight		0,8 kg	1,4 kg

* SELV: safety extra low voltage (voltage < 42.4 V peak or 60 V continuous).

**LV: low voltage > 42.4 V peak or 60 V continuous.

10) What to do if ...? Check that …

What to do if ...?	Check that … (see page 5 for references)
The green LED does not light up when the unit is switched on.	>Check that the mains is present (D). >Check that the terminal strips (K) are correctly positioned on the printed circuit. >Check that the flat cable (Q) of the keypad is correctly connected on the terminal strip on the printed circuit.
The mains is present but there is no secondary voltage.	>Check that the terminal strip is correctly positioned on the printed circuit. >Replace the transformer after checking that there is no short-circuit.
No message appears when the unit is switched on.	>Check that the flat cable (Q) of the display is correctly connected on the terminal strip on the printed circuit.
Nothing happens when a key is pressed on the keypad.	> It is possible that the key has not been pressed long enough. >Check that the flat cable (Q) of the keypad is correctly connected on the terminal strip on the printed circuit. > Check that the keypad is not locked (incorrect access code entered).
With an antenna connected, the “radio” pictogram is still flashing.	>Check that a radio synchronisation antenna is connected to the unit and that its LED is flashing. > Wait at least 4 minutes.
Drift of the time base.	>Refer to the section on setting the time base drift (page 17).
Considerable drift (> 0.5 seconds per day) of the time base.	>Send the equipment back to the BODET maintenance department.

11) Installation examples

11.1 Set the 24V impulse output

Connect the 24V impulse clock line to the terminals 14 and 15.
Switch on the SIGMA.
Access to the technician menu (see page 14).
Access to the menu “Time outputs”.
Use the navigation keys to :

- Select the type of distribution (minute, 1/2 minute, second),
- Enter the impulse duration,
- Enter the time indicated by the slave clocks.

Select Start” and validate with the key .

11.2 Set the DHF output

Connect the DHF transmitter to the DHF output (see page 27).
Switch on the SIGMA.
Access to the technician menu (see page 14).
Access to the menu “Time outputs".
Use the navigation keys to :

- Select the transmission power (25, 125 or 500mW),
- Select the transmission channel (see DHF transmitter instructions),
- Set the SIGMA to “Init” mode,
- When the clocks are synchronised, set the DHF output of the SIGMA to “Start” mode (automatic return from “Init” to “Start” mode after 4 hours).

Validate with the key .

11.3 Set a 24V TBT output

The 24V must be connected to the terminals 14 and 15.
Switch on the SIGMA.
Enter the technician menu (see page 14).
Enter the “Time outputs” menu.
Use the navigation keys to select :
TBT24V.

Caution : this output is protected ; if the current is too high, an alarm will go off and the output will stop supplying 24V.