

DIGITAL TIME SWITCH

User Manual

DW



ABB

Index

■ Technical features	page	3		
■ Safety warnings	page	4		
■ Dimensions	page	4		
■ Wiring diagrams	page	5		
■ Display and keyboard description	page	6		
■ First start-up	page	7		
■ Start page (or main)	page	8		
■ Manual switching	page	11		
■ Menu description	page	12		
■ Settings menu	page	14		
Language setting menu	page	15		
Date setting menu	page	16		
Time setting menu	page	17		
Daylight saving time (DST)/winter time (CET) change setting menu	page	18		
Random switchings setting menu	page	20		
Cycle switchings setting menu	page	21		
Protection PIN setting menu	page	22		
■ Program menu	page	23		
Program menu: new	page	27		
Program menu: new daily time	page	28		
Program menu: new weekly time	page	29		
Program menu: new holiday time	page	30		
Program menu: check	page	32		
Program menu: modify	page	34		
			Program menu: copy	page 36
			Program menu: delete	page 37
			■ Bluetooth menu	page 38
			■ Hour counter menu	page 40
			■ Reset menu	page 42
			■ Firmware menu	page 44
			■ Error signals	page 45
			■ Battery management	page 46
			■ Reference standards	page 46

USER MANUAL

The digital time switches of DW series are electronic devices for the management of the electrical utilities over time. They allow the time programming (periodicity: daily or weekly).

DW1 is equipped with a relay (channel 1) while DW2 is equipped with two relays (2 independent channels).

DW time switches have a Bluetooth interface that allows it to be coupled with mobile devices (smartphone or tablet). Thanks to the free app that can be downloaded from the AppStore and Google Play stores, it is possible to program and make settings directly on your smartphone, and then transfer all the data to the time switch.

The reverse procedure is also possible, i.e. to copy the programming of a time switch on your mobile device.

The backup battery allows you to keep the settings even in case of black-out and can be replaced through the cover on the back of the time switch.

DW time switches are devices of electronic type that perform actions of 1B type , intended to operate in environments with III overvoltage category and pollution degree 2 in accordance with EN 60730-1 standard.

Code	Model	Description
2CSM222531R1000	DW1	Digital weekly time switch 1 channel with Bluetooth
2CSM222521R1000	DW2	Digital weekly time switch 2 channels with Bluetooth

TECHNICAL FEATURES

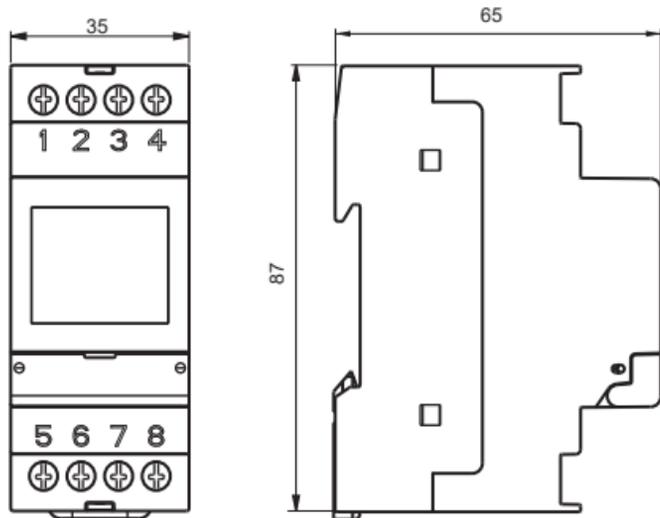
- Power supply: 230 Vac (-15% ÷ +10%) 50/60 Hz
- Power consumption:
 - DW1: 2W (6 VA)
 - DW2: 2W (6 VA)
- Lithium backup battery: 3V, CR2032 type (replaceable)
- Output:
 - DW1: 1 monostable change-over relay with maximum switchable load of 16A / 250V
 - DW2: 2 monostable change-over relays with maximum switchable load of 16A / 250V
- Terminal block for cables with maximum cables section of 2.5 mm²
- Display LCD with backlighting (active with AC power supply)
- Bluetooth BLE 4.2 communication interface (active with mains power supply)
- Storable programs:
 - DW1: 120 events
 - DW2: 120 events (divisible on 2 channels)
- Actions type: 1B
- Operating temperature: -20 ÷ +50 °C
- Operating humidity: 20 ÷ 90% non condensing
- Storage temperature: -25 ÷ +70 °C
- Operating frequency band: 2400-2483.5 MHz
- Maximum transmitted radiofrequency power: 4 dBm
- Container: 2 DIN modules
- Protection degree: IP20
- Insulation: reinforced between accessible parts (front) and all the other terminals

SAFETY WARNINGS

■ **During product installation and operation it is necessary to observe the following instructions:**

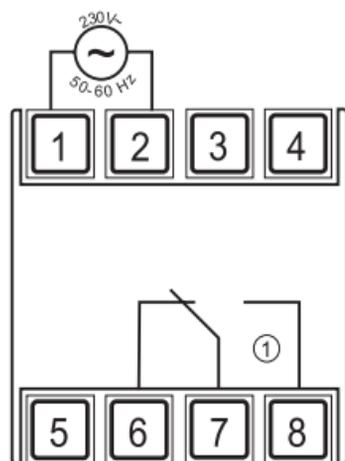
- 1) The instrument must be installed by a qualified person, strictly in observance of the connection diagrams shown in this manual.**
- 2) After installation inaccessibility to the terminals without using dedicated tools must be guaranteed.**
- 3) Before accessing the connection terminals, make sure that the leads are not live.**
- 4) Do not connect or feed the instrument if any part of it is damaged.**
- 5) The product must be installed and activated in compliance with current electric systems standards.**
- 6) Do not use the instrument for anything other than the indicated purpose.**
- 7) In the electrical system upstream of the device must be installed a protection device against the overcurrents**
- 8) The product can be used in environments with overvoltage Category III and Pollution degree 2, according to the Standard EN 60730-1**
- 9) The access to the device must be limited and the default device PIN and Bluetooth password must be changed in order to avoid tempering of programs of relays.**

DIMENSIONS (mm)

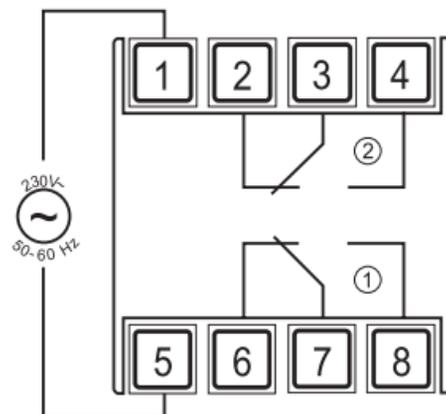


WIRING DIAGRAMS

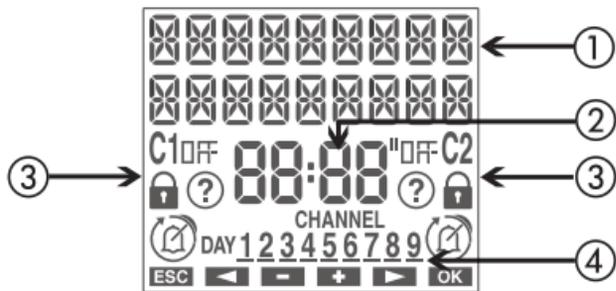
DW1



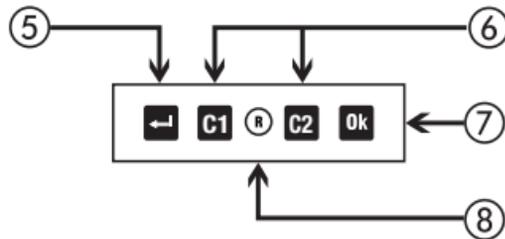
DW2



DISPLAY AND KEYBOARD DESCRIPTION



- ① General indications
- ② Time indication
- ③ Channel 1/channel 2 status indication
 - n/□FF
 - ☉ : active manual program
 - ☉ + ☒ : blocked switchings
 - ☉ + ☐ : active random switchings
 - ☉ + □n/□FF (flashing) : active cycle switchings
 - ☉ : active holiday program
 - ☉ : active pulse program
- ④ Day of the week (DAY) indication



- ⑤ Turn on the display
Access the menu
ESC (one level back)
- ⑥ **"C1"**: decrease datum/previous menu/ switching channel 1/
lock channel 1
"C2": increase datum/next menu/ switching channel 2/
lock channel 2
- ⑦ Confirm selection
- ⑧ Hardware reset

"OK" + "C1" (3 sec): active random switching on channel 1

"OK" + "C2" (3 sec): active random switching on channel 2

"☉" + "C1" (3 sec): active cycle switching on channel 1

"☉" + "C2" (3 sec): active cycle switching on channel 2

FIRST START-UP

- Once out of the package, DW is off: press the key  and wait a moment before activating the display
- The set language is English. To change it, press the key  for at least 3 seconds. Choose among: German, English, Spanish, French, Italian, Russian and confirm with .
- Make connections following the diagrams on page 5 of this manual
- Power DW: the backlighting turns on permanently.
- The presence of the backup battery allows the DW to have updated date and time.

To make the other settings follow the following steps:

Date	- format: DD/MM/YY - 1 st day of the week: Monday
------	---

Daylight Saving time (DST) change: active	- start of daylight saving time (DST): last Sunday of March at 02:00 o'clock - end of daylight saving time (DST): last Sunday of October at 03:00 o'clock
---	--

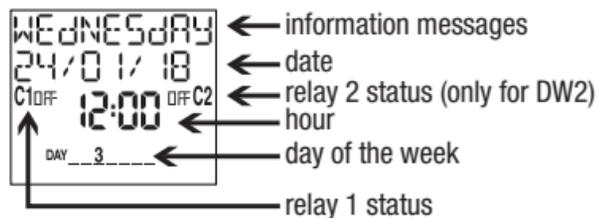
Random switchings:	- minimum: 1 minute - maximum: 5 minutes
--------------------	---

Cycle switchings:	- ON duration: 1 minute - OFF duration: 1 minute
-------------------	---

PIN protection:	disabled (---)
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Bluetooth:	disabled (Password: 000000)
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START PAGE (or main)



Information messages

- day of the week
- product identification code and serial number
- battery status (only if discharged)
- NO RELAY*

* Only if DW is not powered by mains.

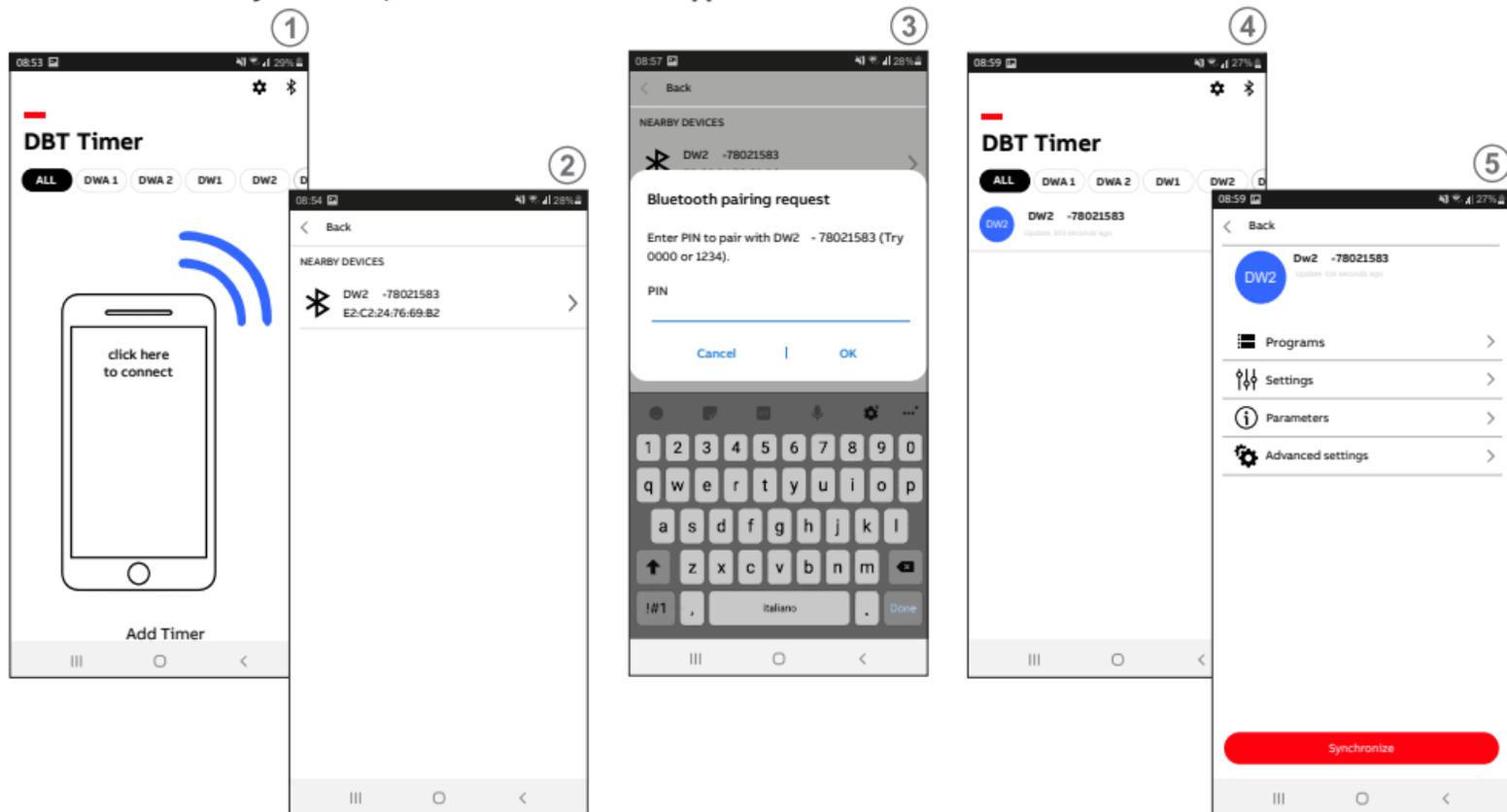
In this condition the backlighting is not active and the relay is in off status.

NOTE: Bluetooth interface is active only when DW displays the start page (main) and only if it's mains power supplied. Therefore, to transfer programs from and to the times witch it is necessary to respect these conditions.

- Press the key:
 - 1** to access the menu of DW
 - C1** and **C2** to change channel 1 and channel 2 status (only for DW2)
 - OK** to display the Bluetooth signal level

NOTE: The device is supplied with deactivated Bluetooth interface. To activate it, access Bluetooth menu (see page 38).

Access the store of your device, install and start the free app DBT TIMER



- ① Activate Bluetooth on DW devices (see page 38).
- ② At the start the app displays the list of the associated DW devices.
To associate a new device, press the symbol “✳” in the upper right corner.
- ③ All the Bluetooth devices detected nearby are displayed: select the device to be associated from the list.
Note: each device is identified by the product code (for example DW) and by the serial number (for example 00000020).
These informations can be viewed from the main page of the DW.
Warning: make sure that the DW is mains powered, Bluetooth interface is activated and that the display shows the main page (initial).
Otherwise the Bluetooth interface is not active and the device is not visible.
- ④ Enter the password to associate the DW with your device.
- ⑤ After successfully completing the procedure, the DW is added in the list of the associated devices.
Select the DW on which you want to act from the list of the associated devices.
Note: communication between the app and the DW is point-to-point. This means that, even in the presence of multiple DW, the app can communicate with one only at a time.
The DW currently connected to the app displays the symbol * immediately after the serial number.
- ⑥ The app displays the initial page of the selected DW. From this page you can:
 - a. Create new programs that will then be copied to the DW.
 - b. Change the settings of the DW.
 - c. View the parameters and associate an alias to the DW.
 - d. Manually control the relay output/s and activate the random switching function or cycle function.

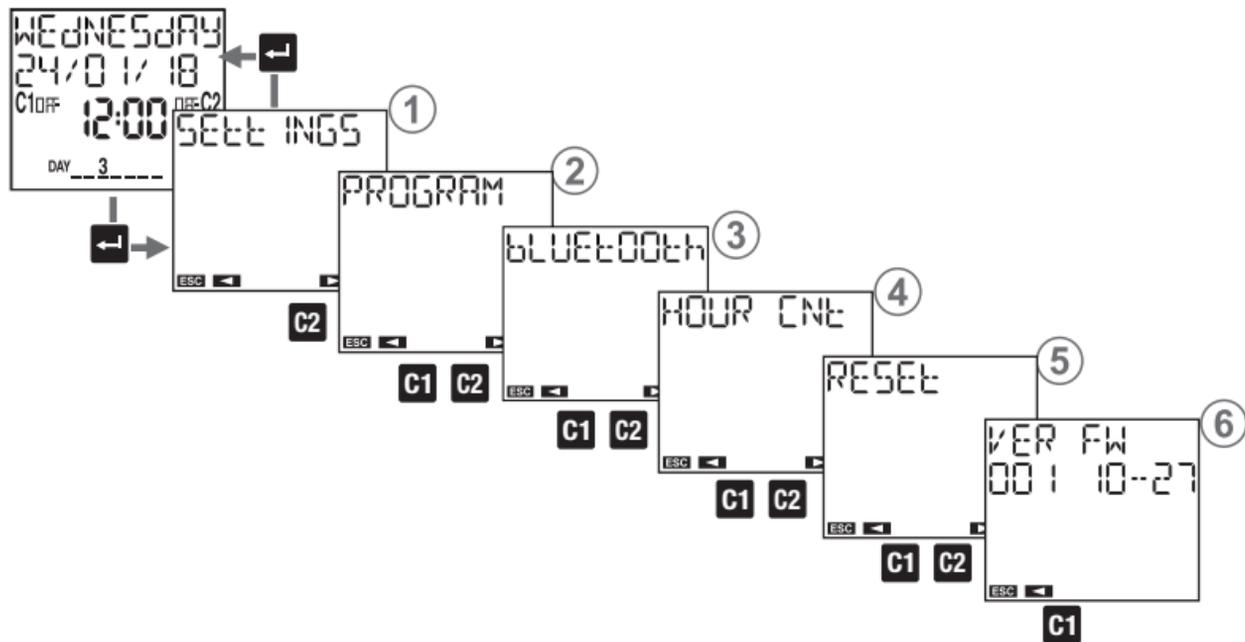


MANUAL SWITCHING

To manually take action on the channels of DW time switches (activated with the combination described on page 6), carry out the operations described below:

- ① **SWITCHING CHANNEL:** press the key **C1** for channel 1 or **C2** for channel 2. If on becomes off and vice versa.
temporary **on**  : the selected channel is set **on** until the next programmed **off** event
temporary **off**  : the selected channel is set **off** until the next programmed **on** event
- ② **LOCK CHANNEL:** press for a long time (for 3 seconds at least) the key **C1** for channel 1 or **C2** for channel 2. The current state is locked until the unlocking (press again for a long time the key **C1** or **C2**).
permanent **on**  the selected channel is locked in **on** position until the manual unlocking
permanent **off**  the selected channel is locked in **off** position until the manual unlocking
- ③ **RANDOM SWITCHING:** press contemporary and for a long time (for 3 seconds at least) the key **OK** and **C1** for channel 1 or **C2** for channel 2. Press again simultaneously and for a long time the keys **OK** and **C1** or **C2** to disable the function.
random  : the selected channel is set on and then will take place switching on/off at random intervals (the minimum and maximum interval can be set from "Settings → random" menu)
- ④ **CYCLE SWITCHING:** press contemporary and for a long time (for 3 seconds at least) the keys  and **C1** for channel 1 or **C2** for channel 2. Press again simultaneously and for a long time the key  and **C1** or **C2** to disable the function.
cycle  (flashing) : the selected channel is set **on** and then will take place switching **on/off** (the on and off duration can be set from "Settings → cycle" menu).

MENU DESCRIPTION

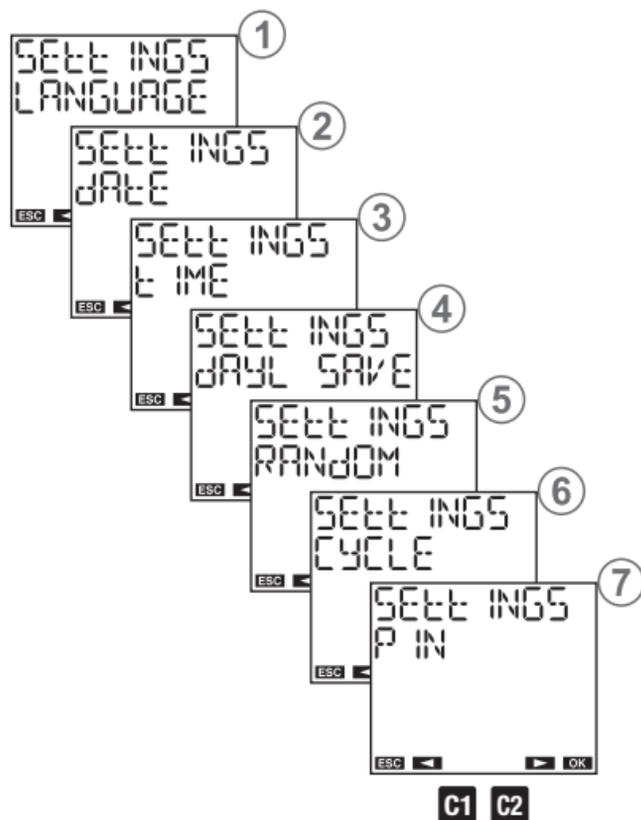


- ① **“Settings”** menu allows you to change: language, date, time, daylight saving time (DST), minimum and maximum duration of the interval between two switchings with random program, ON and OFF duration of cycle switchings, PIN for keyboard lock.
- ② **“Programming”** menu allows you to set a new program or to check, to copy, to modify or to delete a set program.
- ③ **“Bluetooth”** menu allows you to configure the Bluetooth communication interface.
- ④ **“Hour counter”** menu allows you to check the operation hours (relay on) of the loads connected to the relays.
- ⑤ **“Reset”** menu allows you to reset settings, programmed settings, operating hour counter.
- ⑥ **“Ver FW”** menu allows you to check the firmware version installed on the device.

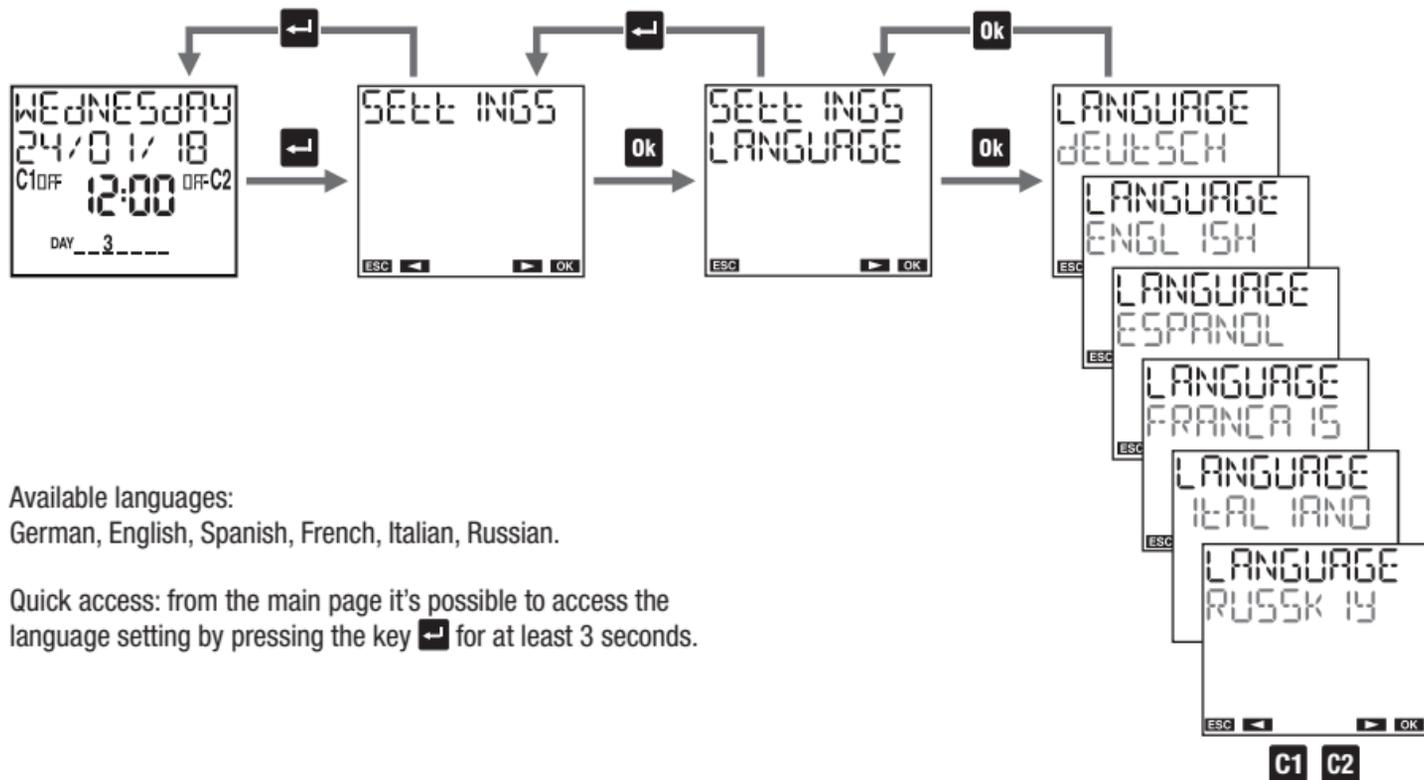
SETTINGS MENU

“Settings” menu allows you to view and eventually to modify the the general operation settings of DW, such as:

- ① language
- ② date
- ③ time
- ④ automatic daylight saving time (DST) change
- ⑤ interval duration between two random switchings
- ⑥ ON and OFF time duration for cycle switchings
- ⑦ keys protection by PIN



Language setting menu

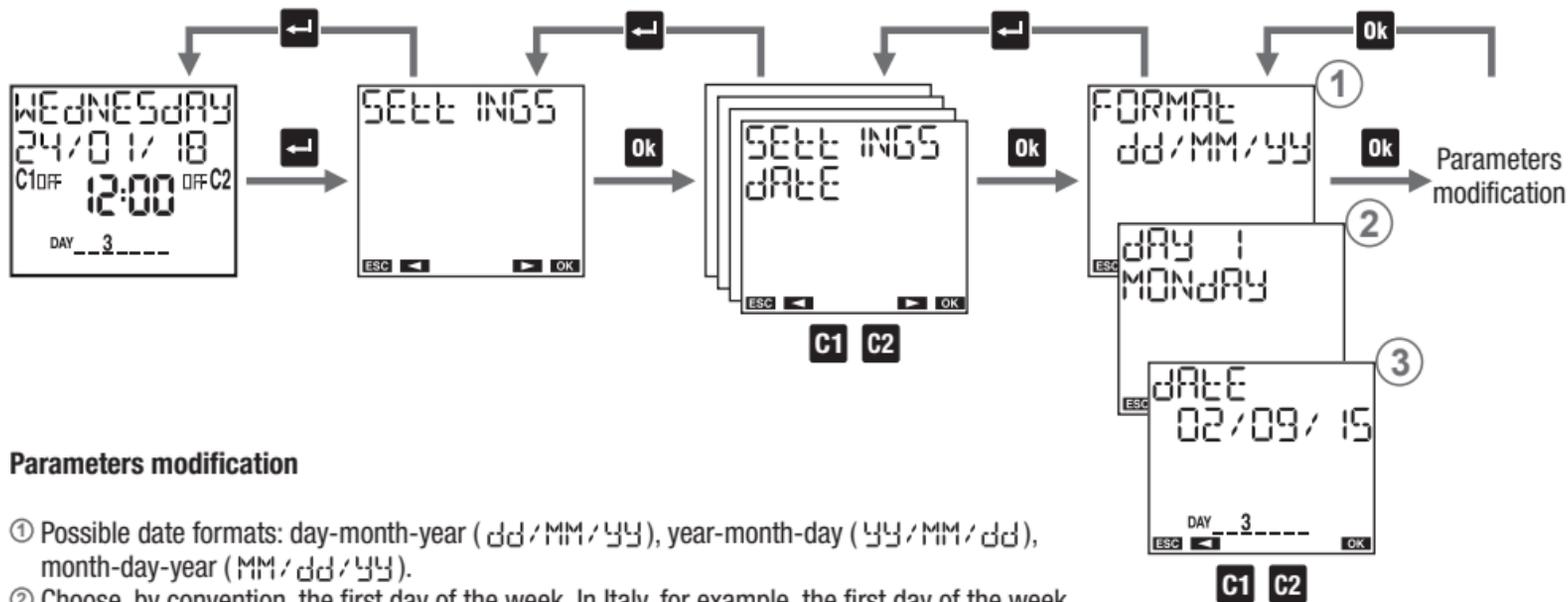


Available languages:

German, English, Spanish, French, Italian, Russian.

Quick access: from the main page it's possible to access the language setting by pressing the key **Left Arrow** for at least 3 seconds.

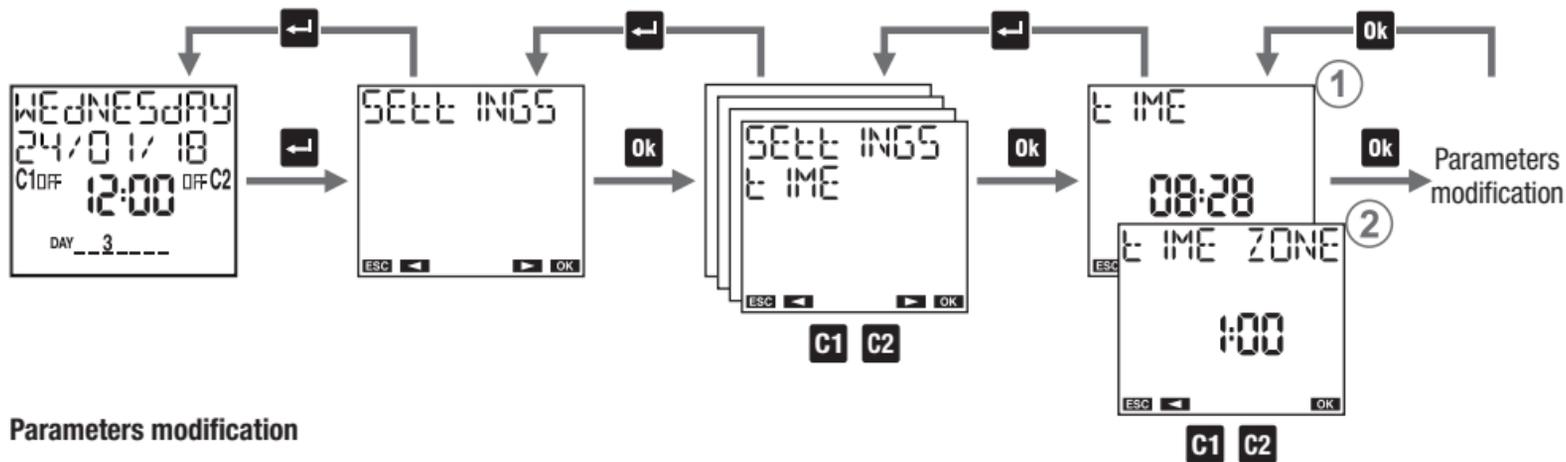
Date setting menu



Parameters modification

- ① Possible date formats: day-month-year (**dd/MM/yy**), year-month-day (**yy/MM/dd**), month-day-year (**MM/dd/yy**).
- ② Choose, by convention, the first day of the week. In Italy, for example, the first day of the week is Monday, in the UK it's Sunday.
- ③ Enter the date: day, month, year.

Time setting menu



Parameters modification

- ① Set the time: hours, minutes.
- ② Set the time zone. Range: -14:00 ÷ +14:00 at 15 minutes steps.
For Italy set +1:00.

Daylight saving time (DST)/winter time (CET) change setting menu

Daylight saving time (DST)/winter time(CET) change and vice versa can occur in an automatic way. In this case, DW:

- increases by an hour in the passage from winter time (CET) to daylight saving time (DST)
- decreases by an hour in the passage from daylight saving time (DST) to winter time (CET)

For every change it's necessary to specify:



the week of the month during which the time change occurs (first, second, third, fourth, last)



the day of the week (Monday: 1, Tuesday: 2, ...)

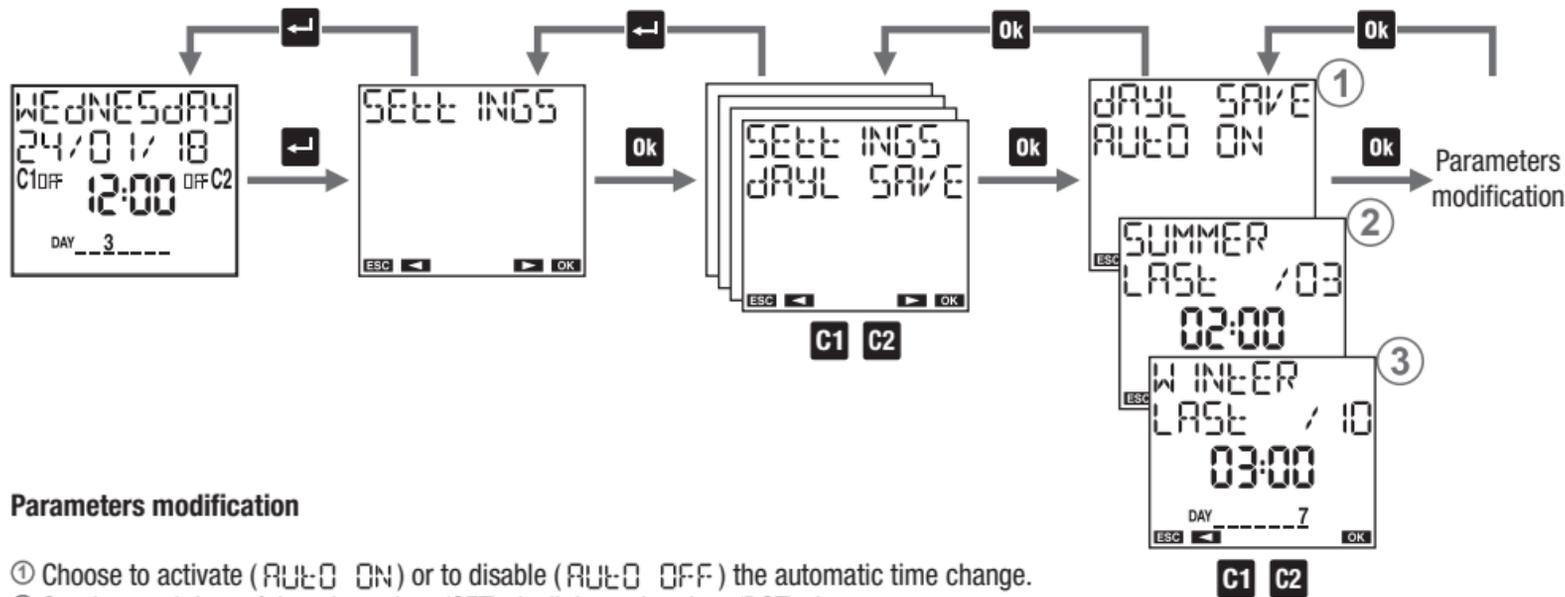


the month



the hour and the minutes

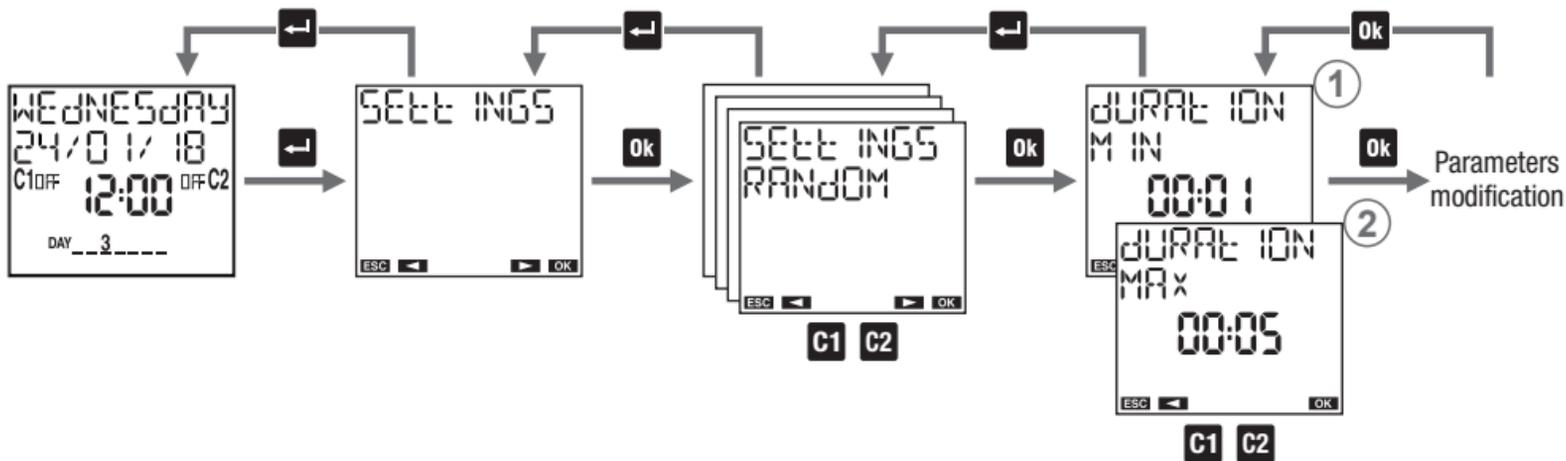
In Italy, for example, daylight saving time (DST) begins occurs the last (LAST) Sunday (7) of March (03) at 02:00 o'clock, and ends the last (LAST) Sunday (7) of October (10) at 03:00 o'clock.



Parameters modification

- ① Choose to activate (AUTO ON) or to disable (AUTO OFF) the automatic time change.
- ② Set date and time of the winter time (CET)-daylight saving time (DST) change.
- ③ Set date and time of the daylight saving time (DST)-winter time (CET) change.

Random switchings setting menu



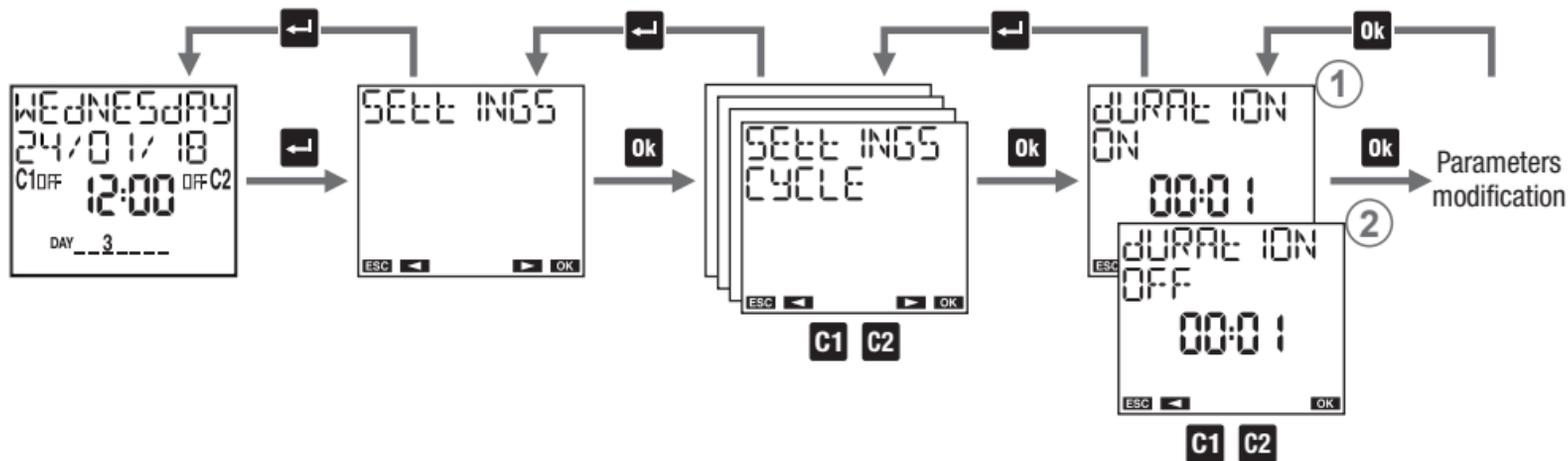
The “random switching ②” function (activated with the combination described on page 6) allows the channel on which it’s active to automatically switch and at random time intervals.

In this menu it’s possible to define the minimum and maximum duration of the time interval between two random switchings. Default minimum duration is 1 minute, maximum duration is 5 minutes.

Parameters modification

- ① Set the minimum duration. It’s possible to set values between 1 minute and the *maximum duration*.
 - ② Set the maximum duration. It’s possible to set values between the *minimum duration* and 23:59 hours.
- Note: setting the minimum duration equal to the maximum, the switchings will occur at fixed time intervals.

Cycle switchings setting menu



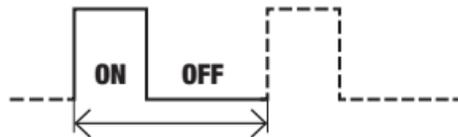
The “cycle switching” function (activated with the combination described on page 6) is a succession of on and off switching. The cycle programme always starts from the on status. In this menu it’s possible to define the duration of on and off.

The duration of the on and off duration cannot be less than one minute.

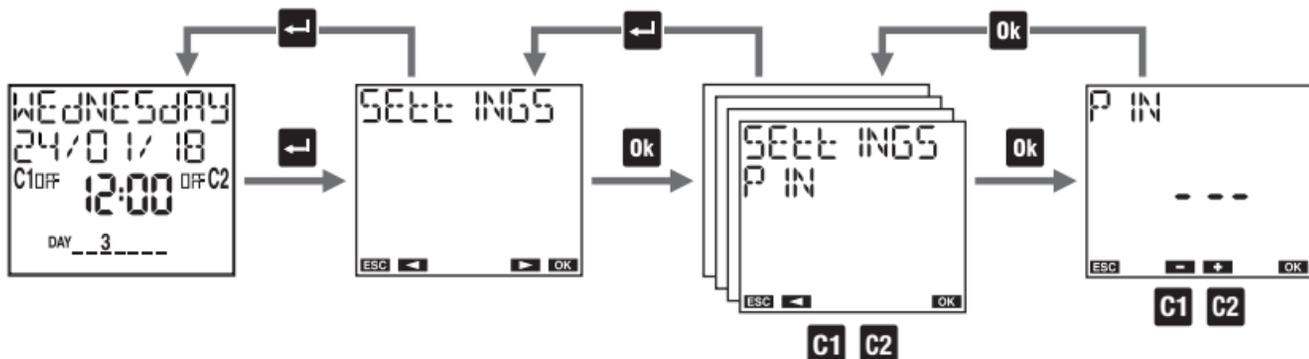
Default on duration: 1minute, OFF duration: 1 minute

Parameters modification

- ① Set the ON duration. It’s possible to set values between 1 minute and 99:59 hours.
- ② Set the OFF duration. It’s possible to set values between 1 minute and 99:59 hours.



Protection PIN setting menu



The protection code (PIN) is used to lock the keyboard and prevent changes by unauthorized persons. With active PIN protection, pressing any key, it's necessary to enter the PIN: if PIN is correct the keyboard unlocks; after 3 minutes without pressing a key, the keyboard will lock automatically.

To activate PIN protection:

- set a value between 000 and 999

To disable PIN protection:

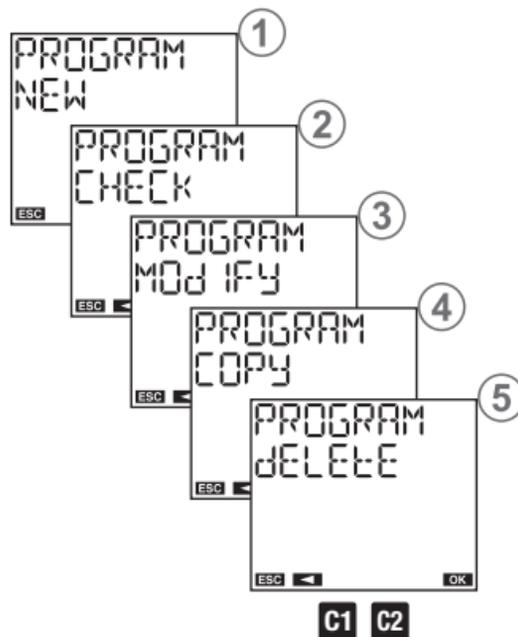
- set "---" (located before 000 or after 999)

Note: If you have forgotten your PIN code to unlock DW it's necessary to carry out a hardware reset (see page 40).

PROGRAM MENU

The menu “program” allows you to:

- ① create a new program
- ② check created programs
- ③ change or delete a created program
- ④ copy all created programs of channel 1 on the channel 2 and vice versa (only for DW2)
- ⑤ delete all programs of a channel



Programs types

- Program ON/OFF: is composed of a switching of the ON relay and of a subsequent switching of the OFF relay. It can have a daily period (everyday with the same modes), weekly (every week with the same modes).
- PULSE ON Program: is an ON relay switching for a maximum duration of 59 seconds. It can have a daily period (everyday with the same modes), weekly (every week with the same modes).
- PULSE OFF program: is a relay switching OFF for a maximum duration of 59 seconds. It can have daily period (everyday with the same modes), weekly (every week with the same modes).
- HOLIDAY program: is a period of time defined by a start time and an end time within which all programmed switchings (of that channel) are disabled. The relay is in OFF position (OFF holiday) or in ON position (ON holiday).

⚠ **Important:** on the same channel can't coexist ON pulses and OFF pulses (if an ON pulse is already present, it's not possible to save a holiday OFF program and vice versa).

⚠ **Important:** on the same channel can't coexist holiday ON programs and holiday OFF programs (if a holiday ON program is already present, it's not possible to save a holiday OFF program and vice versa).

Programs priority

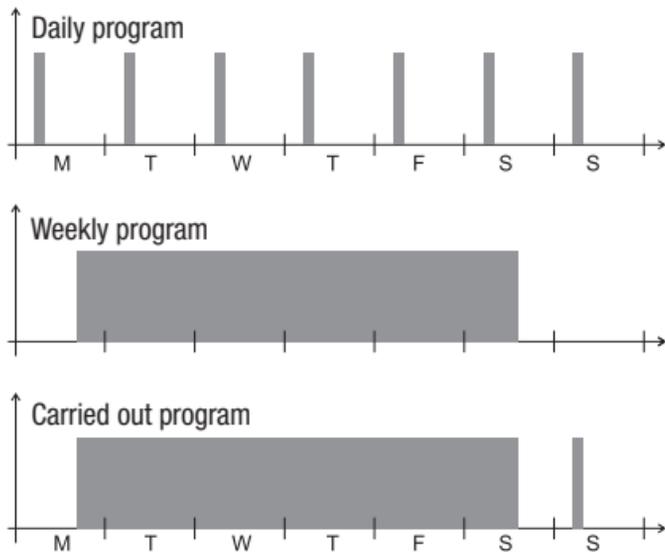
The program priority defines how DW manages the case in which programs with different period are running at the same time (1 indicates higher priority).

Program	Date*	Weekly	Daily
Holiday		1	
Pulse		2	
On/Off		3	4

* Date: select day, month, year (program carried "only once in the life of the product"). If the month is not specified, the program is carried out all days xx of all months of the specified year.

Program priority list on/off

In case in which, on the same channel, on/off programs are provided with different period (daily or weekly) to carry out in the same day, only the program with the highest priority is executed.

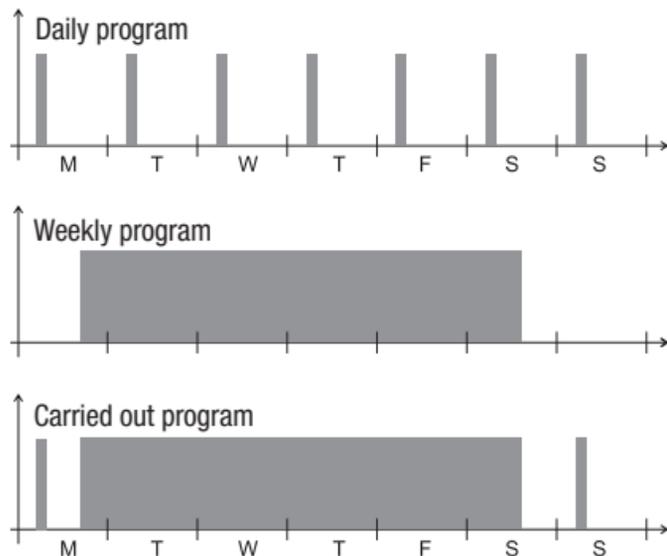


From this example it's possible to see that the daily event on Monday is not carried out because in the same day it is provided the beginning of the week program (even if the daily program

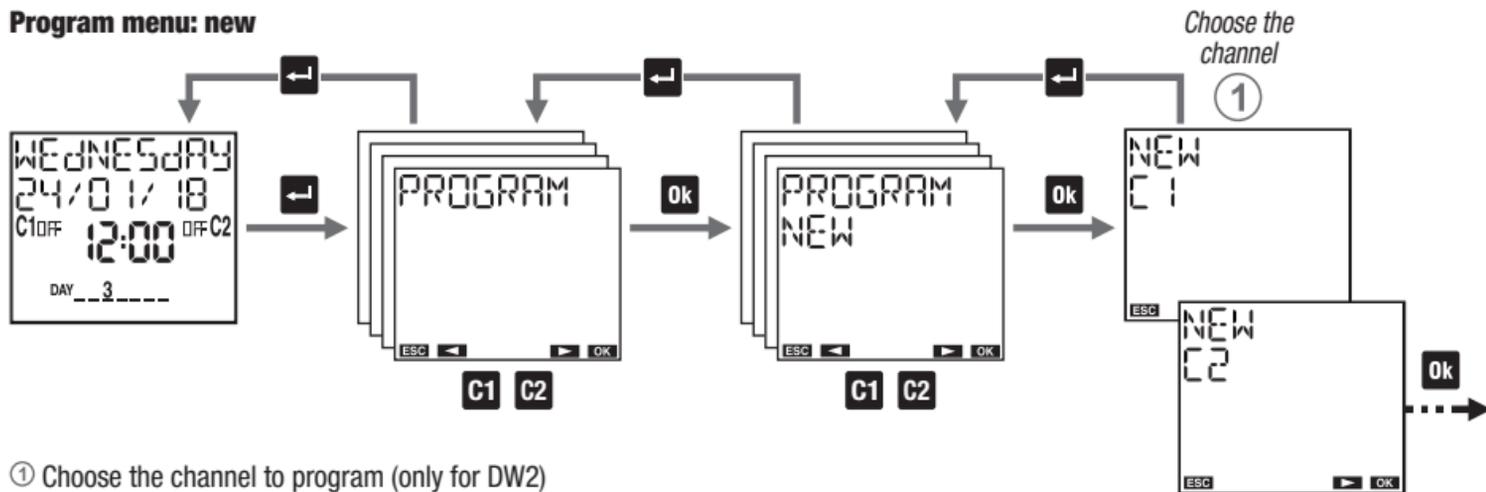
of Monday begins and ends before the beginning of the weekly program). Instead, the daily program of Sunday is carried out because it's the only one running for that day.

Holiday program

The holiday program just begins and ends exactly at the specified times.



Program menu: new

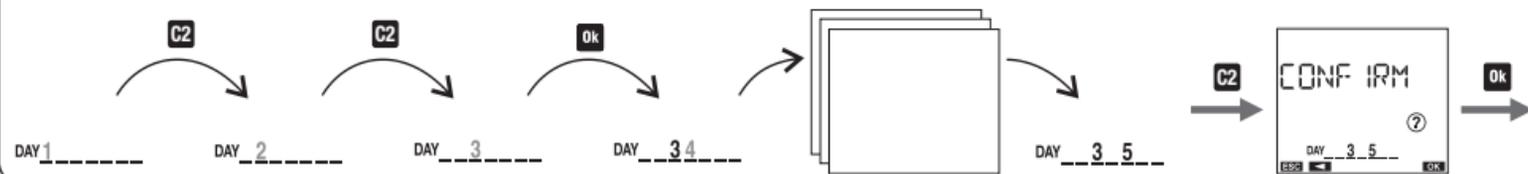


① Choose the channel to program (only for DW2)

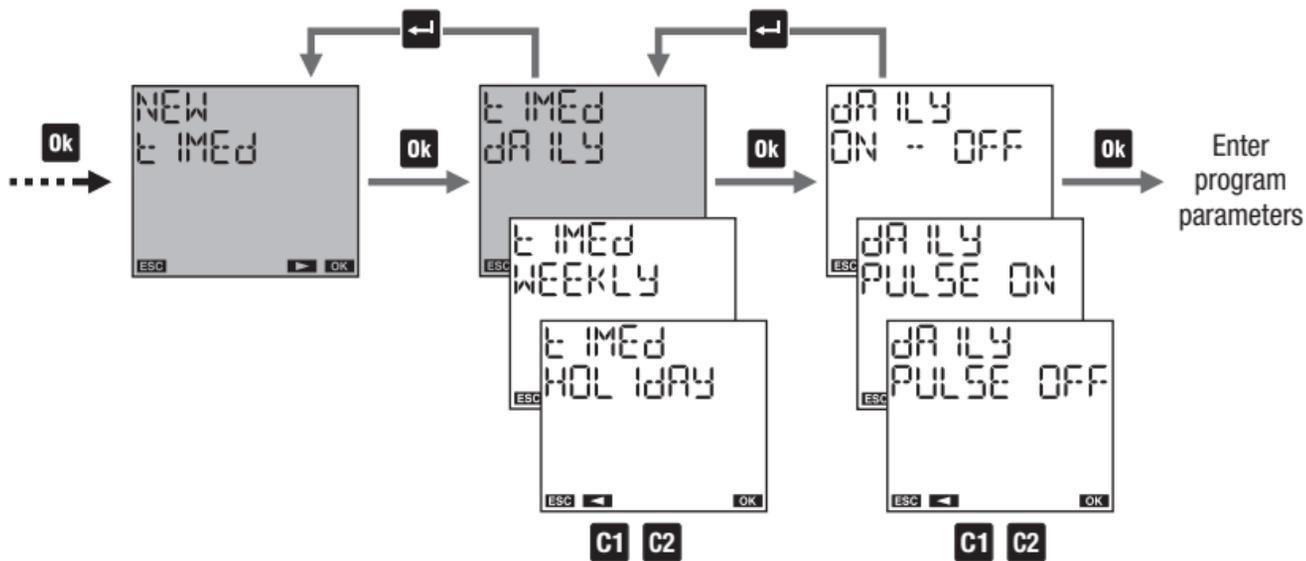
Select days

scroll through the days of the week from 1 to 7:

- by pressing the key **C2** to move to the next day without selecting the current day
- by pressing the key **Ok** to select/deselect the current day and move to the next



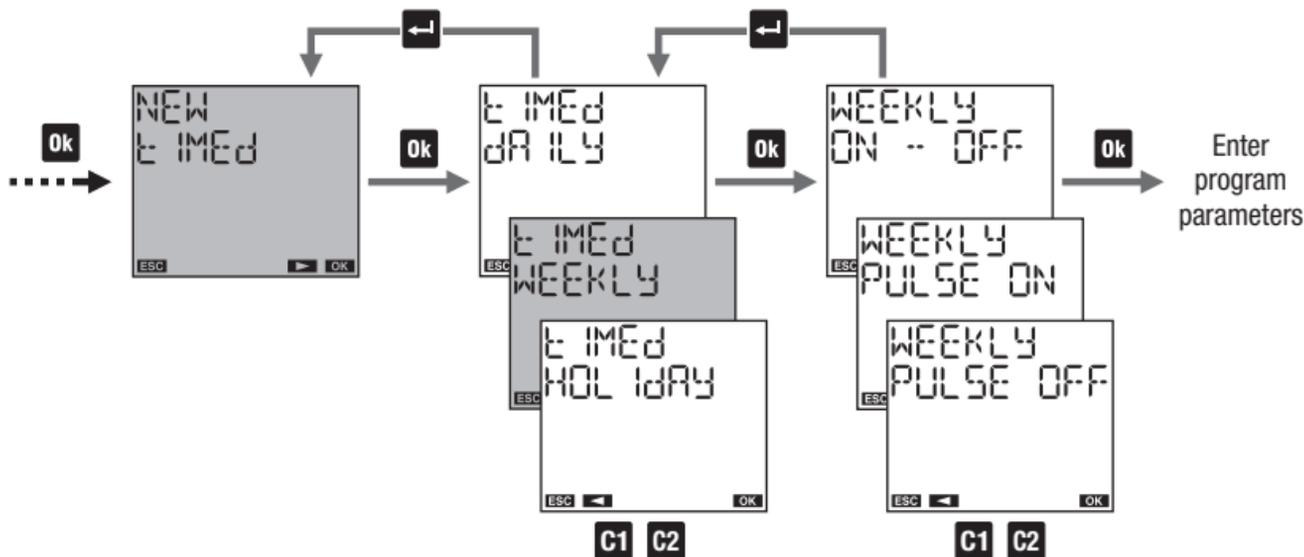
Program menu: new daily time



Program parameters

- on/off: on time and off time
- on pulse: time and pulse duration (max 59 seconds)
- off pulse: time and pulse duration (max 59 seconds)

Program menu: new weekly time

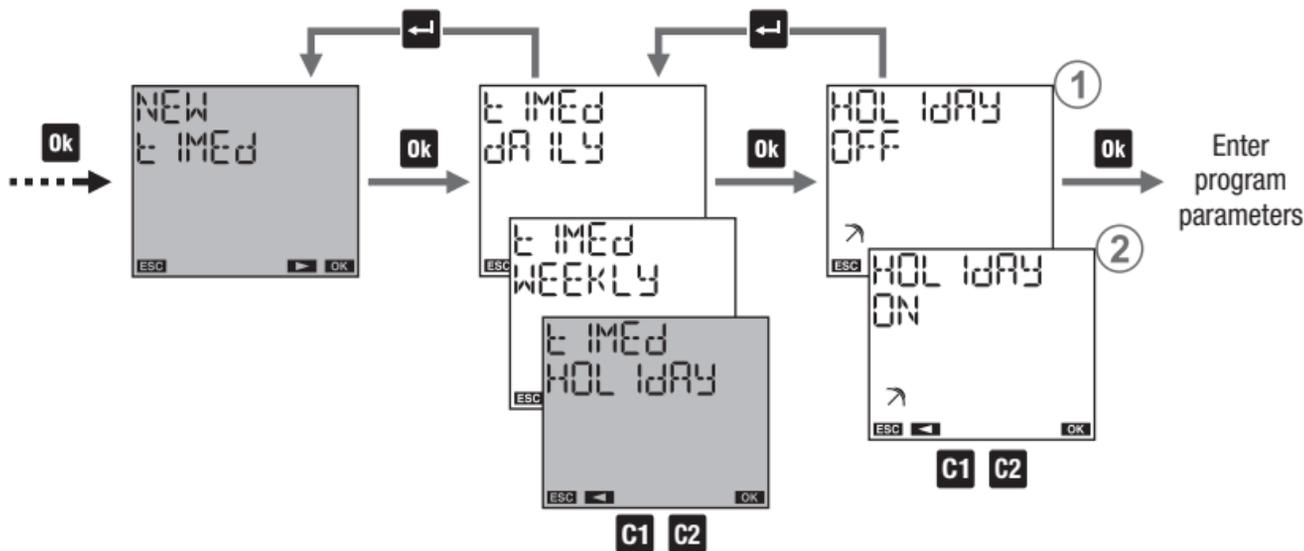


Program parameters

- on/off: day (or days)* and on time, day (or days) and off time
- on pulse: day (or days)* and pulse time, pulse duration (max 59 seconds)
- off pulse: day (or days)* and pulse time, pulse duration (max 59 seconds)

* See "Select days" on page 25

Program menu: new holiday time



- ① HOLIDAY OFF: the relay is OFF from the beginning to the end of Holiday program
- ② HOLIDAY ON: the relay is ON from the beginning to the end of Holiday program

Program parameters

- beginning of the program
- end of the program

How to choose the day (or days) in a holiday program



① to set the program:

in the first, second, third, fourth or last week of the month
in / the day/s (Monday, ...) of the week just specified
the specified month (MM for all months)
the given year (YY for all years)

Note: in this case, the holiday program must begin and end
in the same day. Otherwise ERROR 0 0 is signaled.

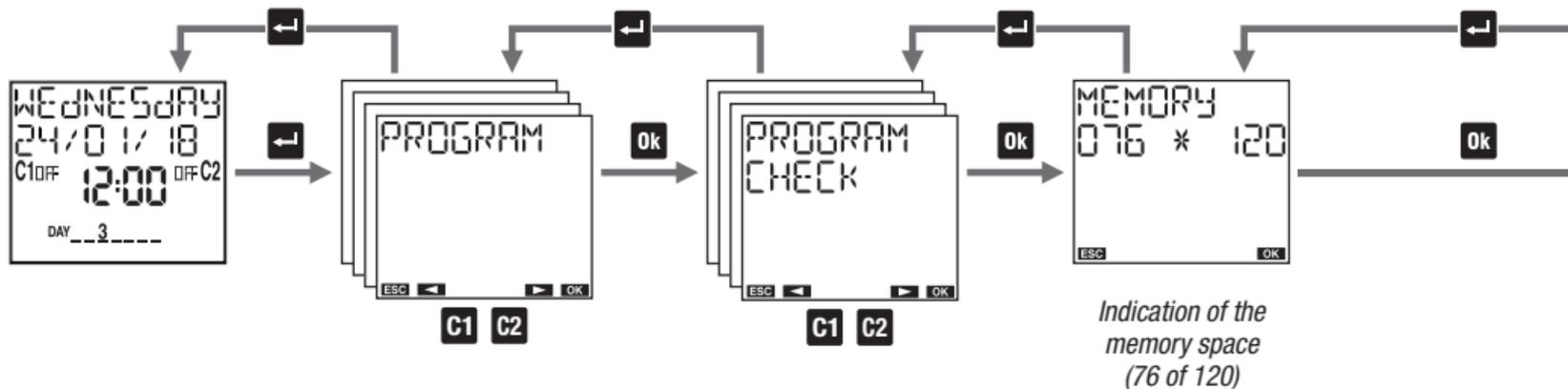
② to set the program on the last day:

---/MM/YY of all months of all years
---/VV/YY of the specified VV month of all years
---/MM/ZZ of all months of the specified ZZ year
---/VV/ZZ of the specified VV month of the specified ZZ year

③ to set the program on the day XX (1,2,3...):

xx/MM/YY of all months of all years
xx/VV/YY of the specified VV month of all years
xx/MM/ZZ of all months of the specified ZZ year
xx/VV/ZZ of the specified VV month of the specified ZZ year

Program menu: check

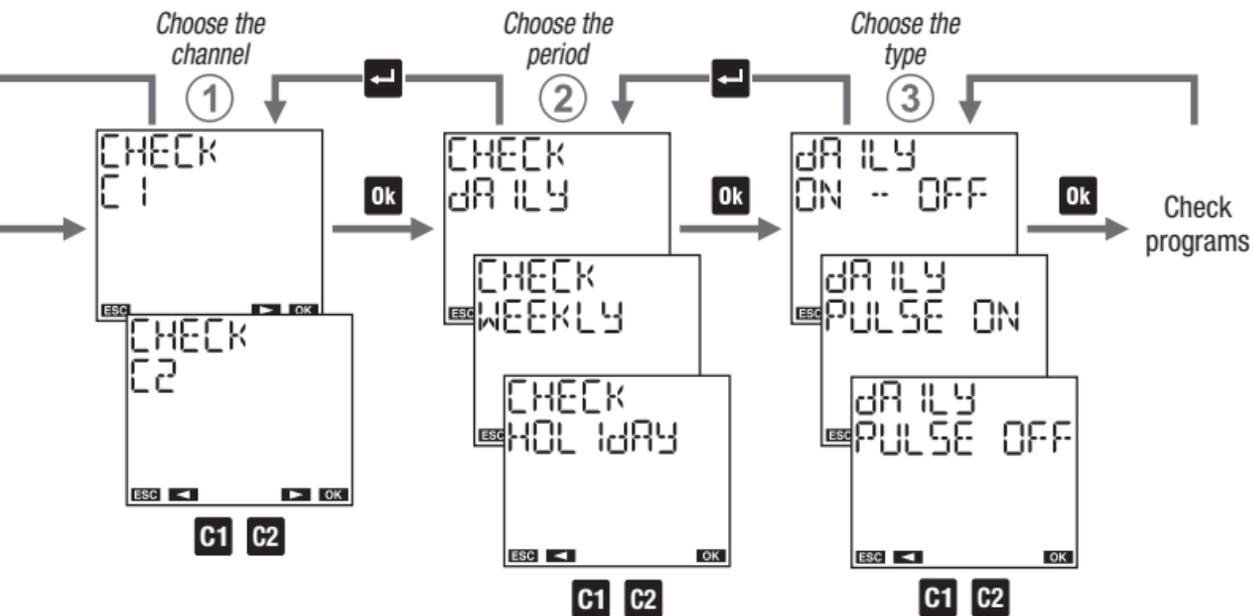


How to check a program

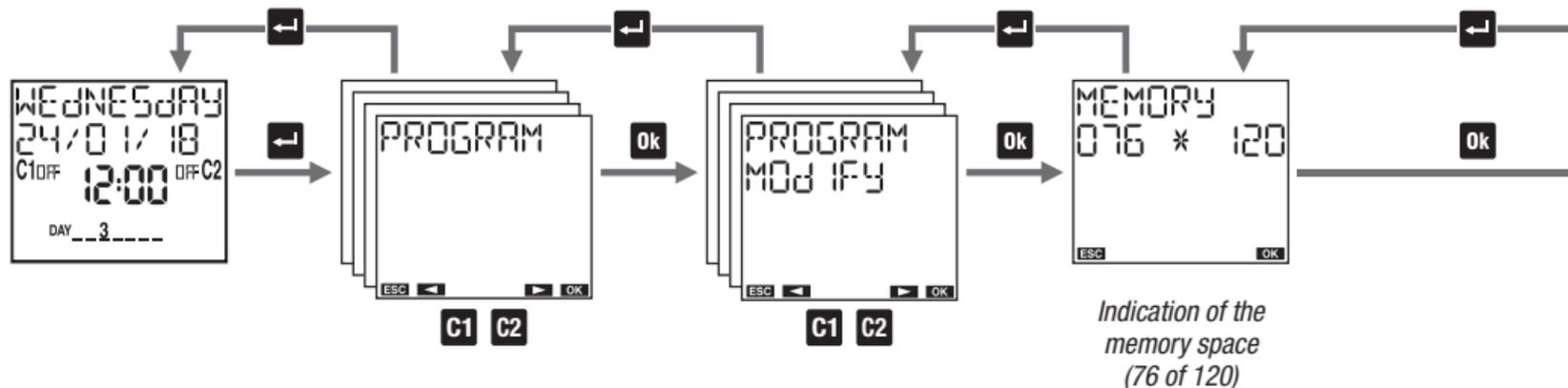
- ① choose the channel (only for DW2)
- ② choose the period: daily, weekly, holiday.
- ③ choose the type: on/off, on pulse, off pulse.

Note: a program requires more screens to be displayed:

- press the key **OK** to move from the first to the second part of the same program
- press the keys **C1** and **C2** to switch from one program to another



Program menu: modify



How to modify or to delete a program

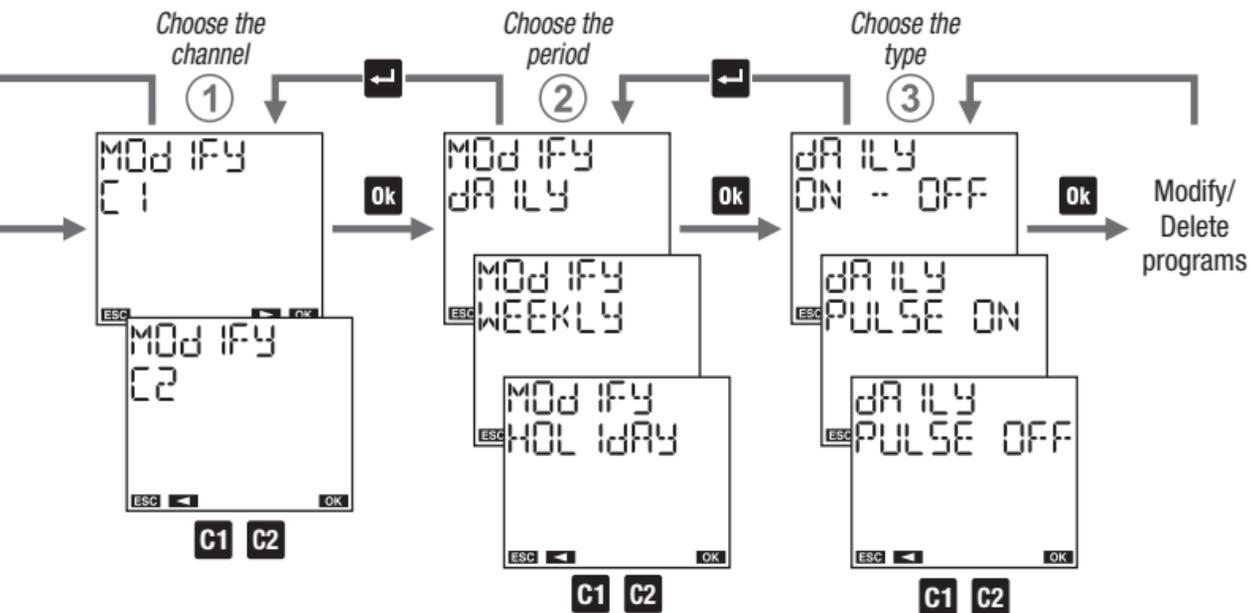
- ① choose the channel (only for DW2).
- ② choose the period: daily, weekly, holiday.
- ③ choose the type: on/off, on pulse, off pulse.

Note: a program requires more screens to be displayed:

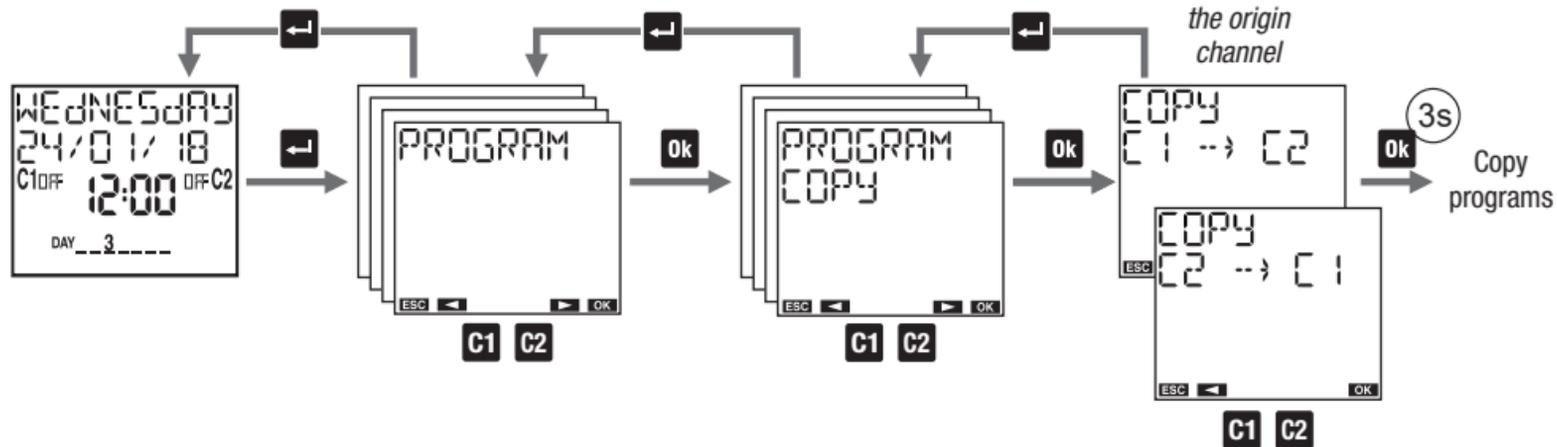
- press the key **Ok** to move from the first to the second part of the same program
- press the keys **C1** and **C2** key to switch from one program to another

To modify: press for a long time (at least 3 seconds) the key **Ok**

To delete: press for a long time and simultaneously the keys **Ok** and **↵**

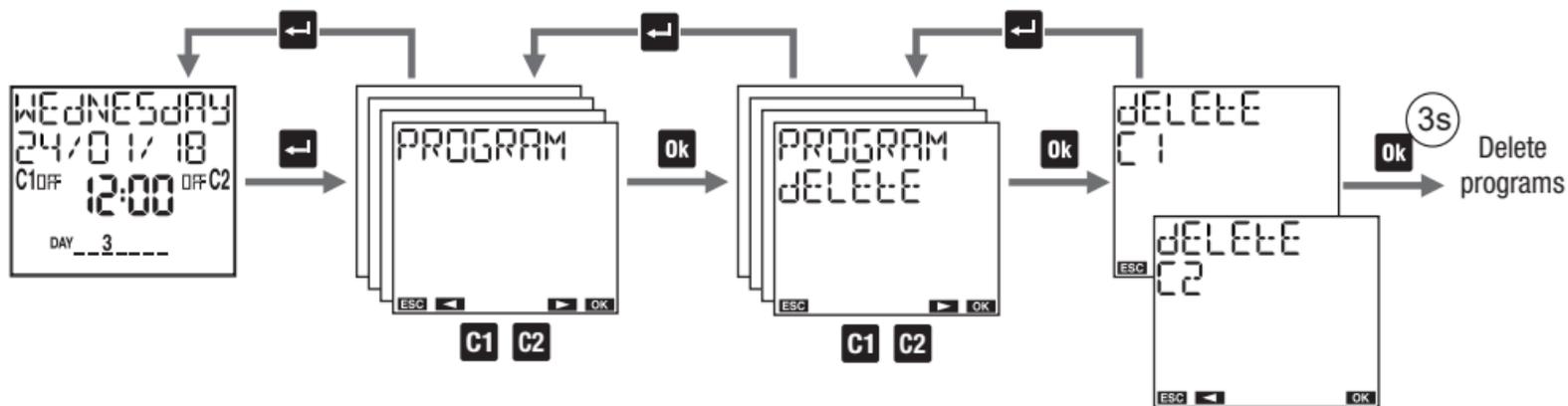


Program menu: copy (only for DW2)



"Copy" menu allows copying the programs of a channel (origin channel) on the other channel (channels destination).
Note: the programs previously stored on the channel destination will be deleted.

Program menu: delete



"Delete" menu is used to delete all stored programs on the specified channel.
Note: to delete one single program to see "modify" mode (see page 32).

BLUETOOTH MENU

The Bluetooth menu allows you to enable or disable the Bluetooth interface and change the password used to associate your device (smartphone or tablet) to DW.

The device is supplied with deactivated Bluetooth interface. To activate it, it's enough to access Bluetooth menu and set a password different from 000000. With Bluetooth menu it's possible to activate or deactivate the interface or change the password.

After changing the password the first time, it's not possible to set the value 000000.

To enable the Bluetooth interface:

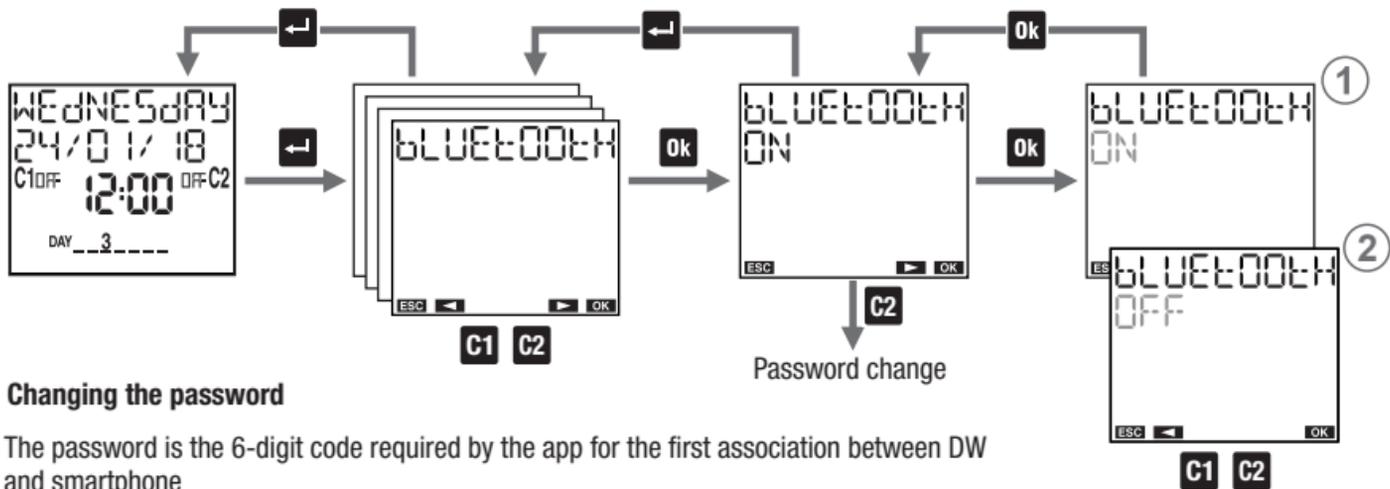
- ① set Bluetooth ON

Warning: to make the Bluetooth interface active, the DW must be mains powered and connected to the main page (see page 8). The Bluetooth interface is therefore not active when browsing through the DW menus.

To disable the Bluetooth interface:

- ② set Bluetooth OFF

In this way no communication can take place between your device and DW. DW works with the settings and programs already set; any changes or creation of new programs must be made by acting directly on the keyboard of DW.



Changing the password

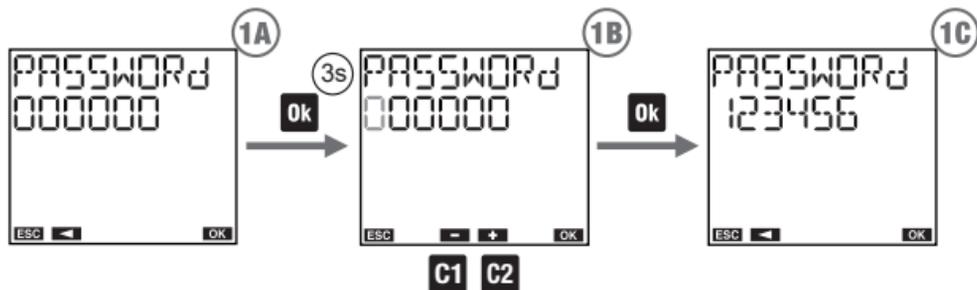
The password is the 6-digit code required by the app for the first association between DW and smartphone

①A Press the key **Ok** for at least 3 seconds until the first digit of the password starts to flash.

①B Set the first digit with the keys **C1** and **C2** keys and press the key **Ok** to confirm and move to the next digit.

①C Repeat step ①B to set all 6 digits. After confirming the last digit, the display shows the new password.

Press the key **↵** to exit the menu.



HOUR COUNTER MENU

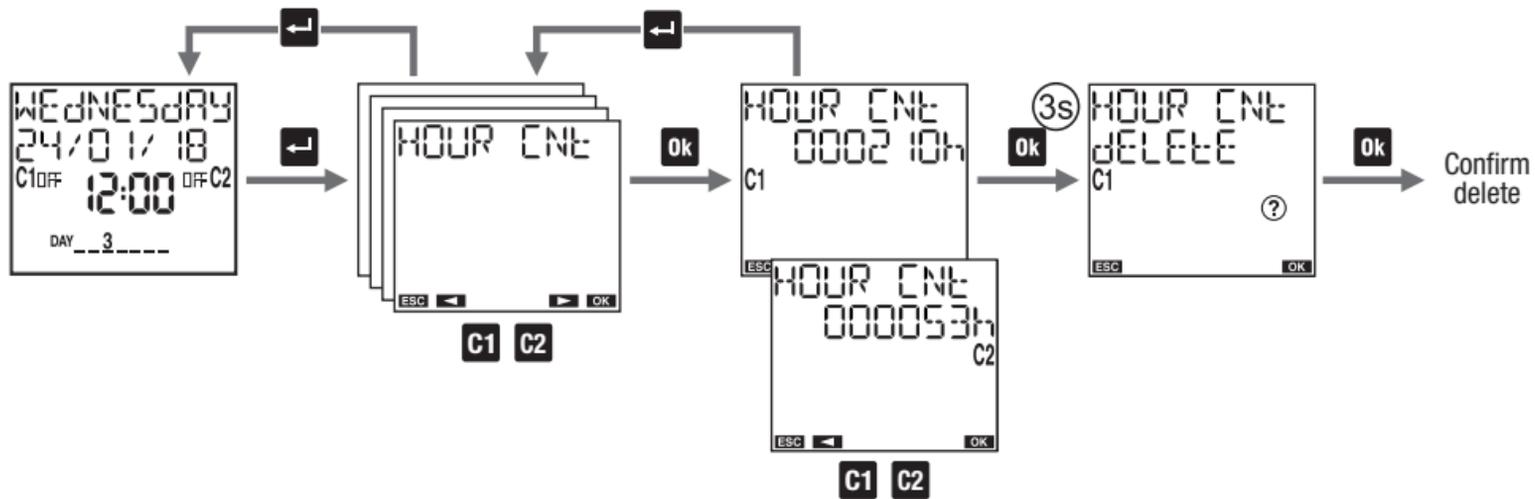
“Hour counter” menu allows you to display the hours of use (relay on) of connected loads.

The maximum value of the counter is 99999 hours (about 11 years); reached the maximum limit, the counter resets automatically.

To reset a counter:

1. select the desired channel (only for DW2)
2. press the key **OK** for 3 seconds until the display shows “HOUR CNT DELETE ?”
3. confirm by pressing **OK** (press **↵** to exit without zeroing)

Note: it's possible to reset all counters contemporary from the “Reset” menu (see page 40).



RESET MENU

“Reset” menu allows you to restore the initial state of the device.

Available resets:

- ① Settings reset: deletes all the carried out settings (except the language and the PIN)
- ② Time programs reset: deletes all saved time programs
- ③ Holiday programs reset: deletes all saved holiday programs
- ④ Counter reset: resets the counters of all channels
- ⑤ Reset all: carries out all the above described resets and deletes the language and PIN protection

There is also another reset, of hardware type, which allows you to reset the device in case it responds to the pressing of the keys so unexpectedly, without losing the carried out settings/programs (only the date and the time are lost).

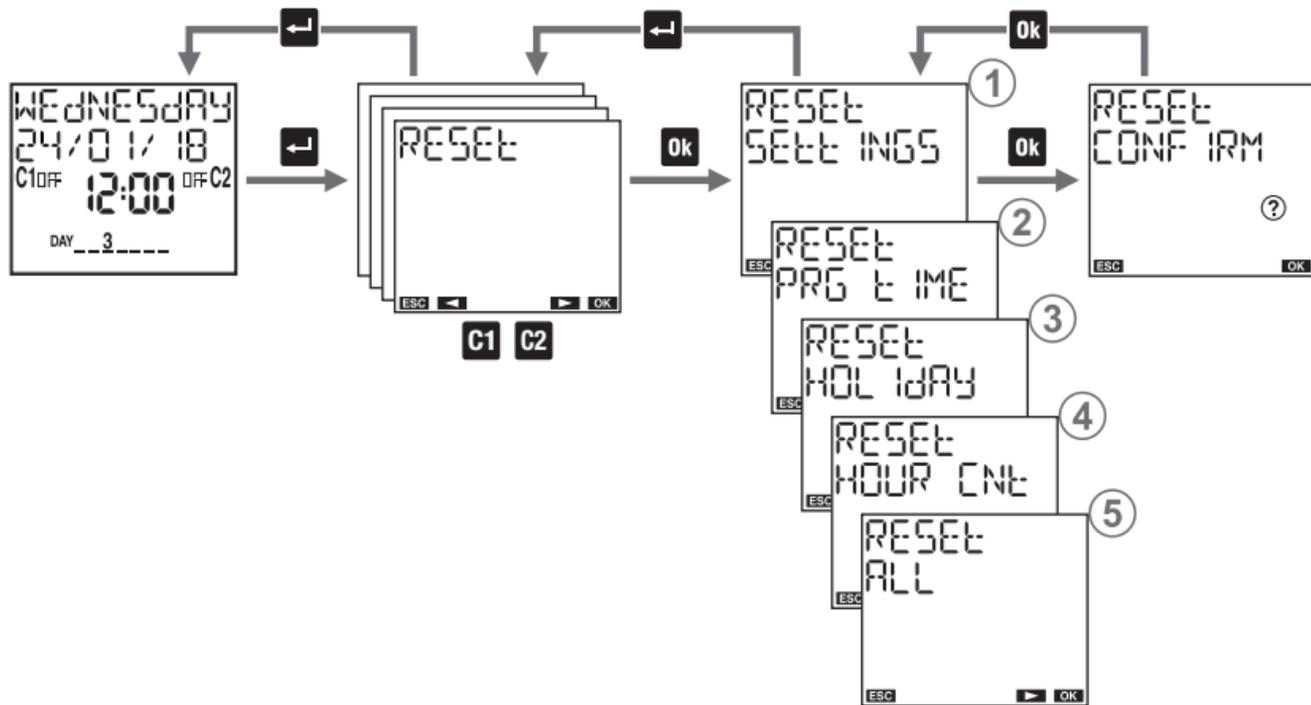
To carry out a hardware reset:

1. press the key “R” with a sharp object



The hardware reset is also useful when you forget PIN protection.

Reset, in fact, unlocks the keyboard for 3 minutes, the necessary time to access the appropriate menu and check/disable PIN.



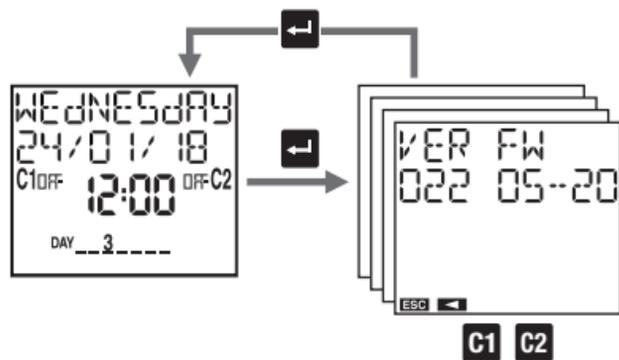
FIRMWARE MENU

This menu shows the firmware installed in the device, where:

022 is the revision index

05 is the month

20 is the day



ERROR SIGNALS

When setting up programs, in case of a discrepancy, the following error messages can occur:

- ERROR 001 on and off events with different frequency (each on event must have an off event)
- ERROR 002 on and off concomitant events of the same program
- ERROR 003 Two or more consecutive on events of the same program / Two or more consecutive off events of the same program
- ERROR 004 Invalid date
- ERROR 005 Insufficient memory
- ERROR 006 Attempt to set an on pulse on a channel where is already stored an off pulse (see page 25)
- ERROR 007 Attempt to set an off pulse on a channel where is already stored an on impulse (see page 25)
- ERROR 008 Attempt to set an on holiday program on a channel where is already stored an off holiday program (see page 25)
- ERROR 009 Attempt to set a holiday off program on a channel where a holiday on program is already stored (see page 25)

ERROR 010 Attempt to set a holiday program of on and off events on different days of the week (see page 31)

ERROR 030 Error accessing memory *

* In this case, carry out a hardware reset (see page 40).
If the error persists, contact ABB technical support mobile.

BATTERY MANAGEMENT

When the battery is close to empty, on the first line of the display appears 𐄂𐄂𐄂𐄂𐄂𐄂𐄂. In this case, the battery must be replaced as soon as possible. **Use only batteries of CR2032.**

To replace the battery:

- disconnect the mains
- remove the battery slot cover, turning it anti-clockwise
- replace the battery and remount the cover, turning it clockwise
- connect the power supply

Warning: do not use metal objects (such as screwdrivers) to remove the battery because this may cause the power reserve to be canceled, resulting in a loss of date and time.

Warning: in order not to lose the programming steps and carried out settings, it is necessary to ensure that the time for the battery replacement doesn't exceed 60 seconds (in absence of power by means).



Dispose of the used batteries observing the laws in force in relation to the disposal of hazardous waste.

REFERENCE STANDARDS

EU CONFORMITY DECLARATION

ABB declares that the device complies with the EU directive 2014/53/EU (RED) with reference to the following standards:

- EN 60730-2-7
- ETSI EN 301 489-1
- ETSI EN 301 489-17
- ETSI EN 300 328

The complete text of EU conformity declaration is available at the Internet address ABB - www.abb.com



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