

contact which, when closed, will cause all channels of the module to switch off. When the contact is open, normal operation will resume. Even the channels controlled by a chronostat will be switched off by the global standby input. If the system is operating in the heating mode (as determined by the Heating/Cooling status of a chronostat or an external input or, in the absence of the latter, by the thermostat settings), the antifreeze function will be activated with a fixed setpoint of 6.0°C to prevent the temperature within the rooms from falling below this value.

'Economy' input

When closed, the external "Economy" input will cause all thermostat-controlled outputs to regulate temperature at the reduced economy setpoint. See paragraph on "Associating

thermostats with a chronostat". By connecting an external clock switch to the "Economy" input you can reduce the temperature setting during the desired periods of the day.

Maintenance

This product requires no particular maintenance. Once the system is installed and operational, it is good practice to check periodically that the quality of the signal received is good. If the signal is weak or absent on one or more channels, the corresponding LEDs will blink: this could occur if the batteries are low. If the fuse has blown (see 'Troubleshooting'), disconnect the power supply and check the electrical system and valves used. Replace with a fuse of the same type and rating.

TROUBLESHOOTING		
SYMPTOM	PROBABLE CAUSE	REMEDY
The module appears completely 'dead'. None of the LEDs is lit.	There is no power.	Check the device power supply.
	The thermal fuse on the incoming power line has tripped.	Switch off the device. Wait at least 15 minutes and then switch it back on (see section on 'Electrical connections').
The module is working correctly, the channel LEDs and relays switch on but the valves connected to the outputs are all inactive.	The fuse protecting the loads has blown.	Make sure that both the mains and auxiliary power supplies are disconnected, then check the integrity of fuse F1 (Fig. 2) and, if necessary, replace it with a new fuse of the same type and rating (also see section on 'Electrical connections').
One or more channel LEDs (3 Fig. 1) on the front panel of the module blink green continuously.	The device is signalling a fault because it has detected an error in the temperature probe of the thermostat or chronostat transmitter.	Check the probe of the transmitter and, if present, the jumper for selecting between the internal and external probe. Carefully read the instructions of the transmitters for further information.
One or more channel LEDs (3 Fig. 1) on the front panel of the module blink yellow continuously.	The device is signalling a fault because it has detected the thermostat or chronostat transmitter batteries to be running low.	Replace the batteries of the transmitters concerned. Carefully read the instructions of the transmitters for further information.
One or more channel LEDs (3 Fig. 1) on the front panel of the module blink red continuously.	The channels in question are in an 'alarm status' due to the absence of radio communication.	Check the radio communication using the 'test' function on the transmitter. Assess whether the devices need to be moved away from metal shields or a 'repeater' needs to be installed.
A transmitter is in the 'test' mode but the module fails to switch on any relay, even though the LED of the active antenna indicates that the radio commands are being received.	The commands emitted by the transmitter are being correctly received but do not correspond to any of the addresses memorised in the relay module.	Carry out the 'self-learning' procedure as directed in the section 'Configuring the System' for the channel you wish to associate with the transmitter.
The 'power' LED (2 Fig.1) is blinking	There is a problem in communication with the active antenna or other modules connected in the chain.	Check that the data cables are plugged in correctly. The cable connected to the 'SIGNAL IN' socket must lead in from the active antenna or from the 'SIGNAL OUT' socket of a 8-channel relay module.
A transmitter is in the 'test' mode but the module fails to switch on any relay, the LED of the active antenna remains steadily lit green, not indicating any reception of commands via radio.	The signals received are too weak to enable correct decoding of the commands.	Assess whether the devices need to be moved away from metal shields or a 'repeater' needs to be installed.

In the view of a constant development of their products, the manufacturer reserves the right for changing technical data and features without prior notice. The consumer is guaranteed against any lack of conformity according to the European Directive 1999/44/EC as well as to the manufacturer's document about the warranty policy. The full text of warranty is available on request from the seller.

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2 + 1 CHANNEL RELAY MODULE FOR HEATING / COOLING SYSTEMS

- Indication of the quality of radio communication for each channel
- Global standby and Heating/Cooling changeover inputs
- Auxiliary output for pump or boiler
- Regulation with temperature reduction (economy mode)
- Control of NC and NO actuators
- Possibility to be connected in chain to a 8 channel relay module
- 230V~ power supply with option of powering actuators at a different voltage

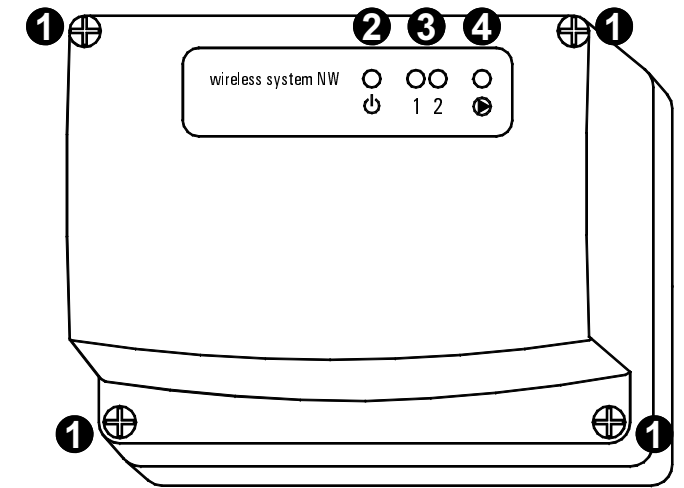


Fig. 1: External aspect.

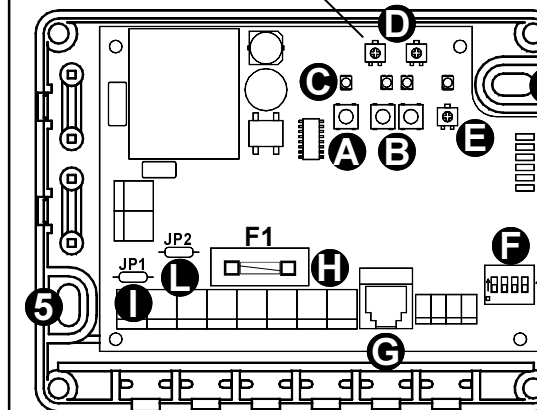
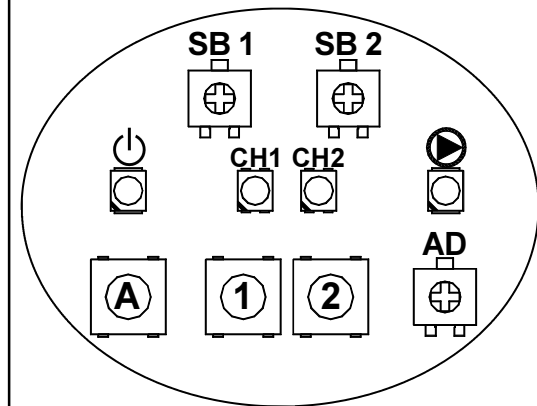
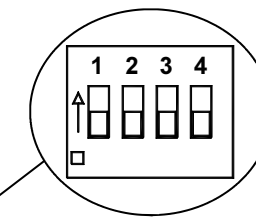


Fig. 2: Internal view of components.



KEY:

- A Association button (A)
- B Self-learning buttons (1,2)
- C LEDs
- D Temperature reduction trimmers (SB1 / SB2)
- E Auxiliary output delay trimmer (AD)
- F 'Options' DIP-switch
- G Data cable IN connector
- H Fuse F1
- I Jumper wire JP1
- L Jumper wire JP2

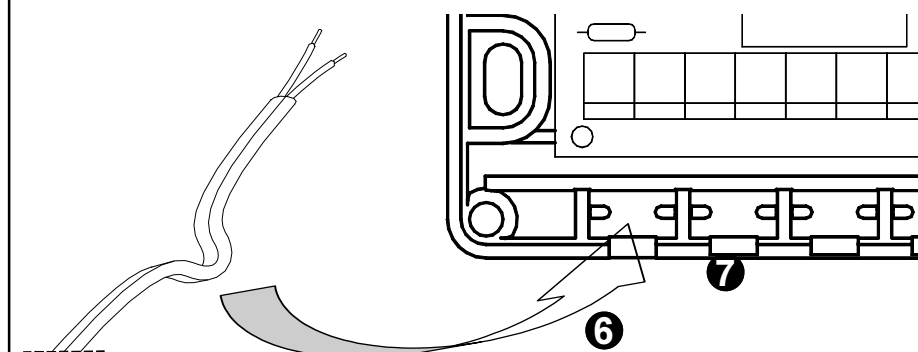


Fig. 3: Instruction for cable routing.

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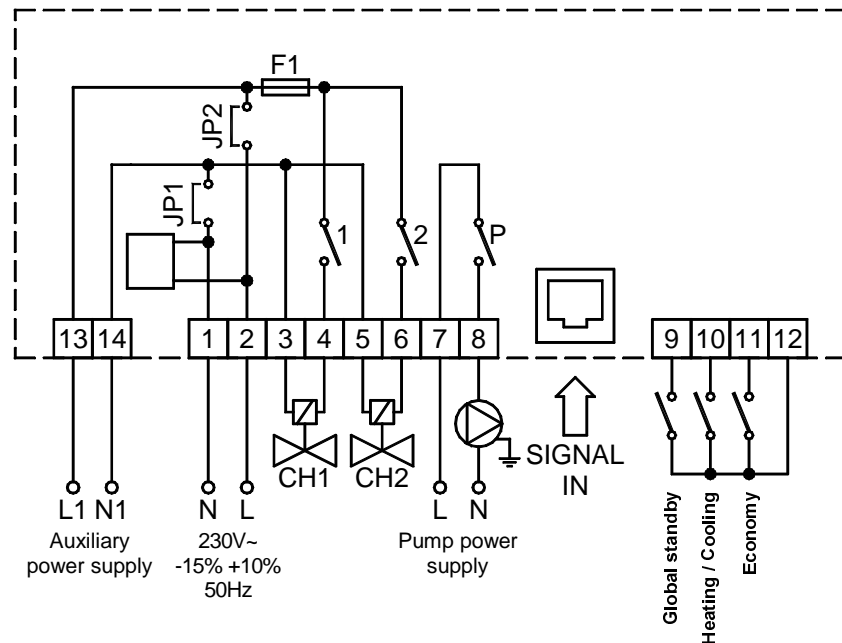


Fig. 4: Wiring diagram.

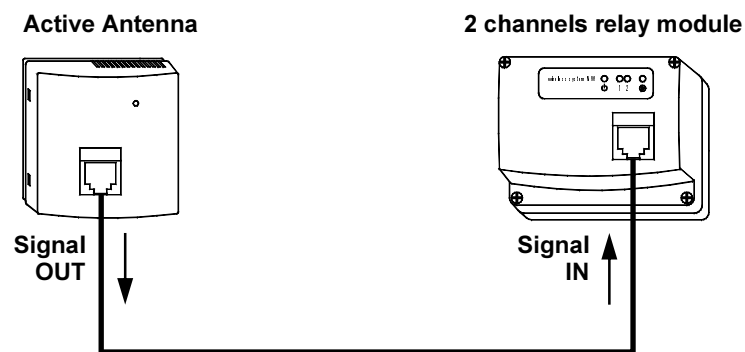


Fig. 5: Connection of cables for a system based on an active antenna and one 2-channels relay module.

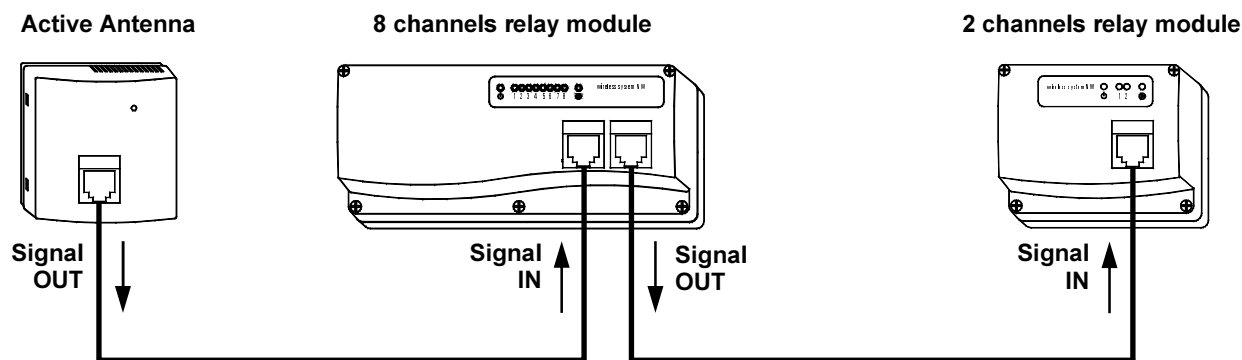


Fig. 6: Connection of cables for a system based on an active antenna, one 8-channels relay modules and one 2-channels relay module.

inactivity the module will automatically exit the configuration mode, saving any changes made.

Configuring the periodic activation of actuators

The relay module is set in the factory to carry out a function of periodically switching on the actuators: if the actuator outputs remain off for long periods, they will automatically be switched on for at least 5 minutes every 2 days to prevent damage from being caused by inactivity. If this function is not required, it can be individually disabled for each channel.

- To enter the configuration mode, press the association button 'A' and channel 2 button 'CH2' together for three seconds.
- The LED of each channel will start blinking. The meaning is as follows:
blinking green: periodic activation of actuators enabled
blinking red: periodic activation of actuators disabled
- Pressing the button corresponding to a channel will change the setting and the LED will indicate the new status.
- Press the association button 'A' to terminate the configuration procedure. In any event, after 20 sec of inactivity the module will automatically exit the configuration mode, saving any changes made.

OPTION DIP-SWITCH

DIP-SWITCH 1: Safety antifreeze option

- ▲ In the absence of radio communication, it switches on the actuator every hour for 18 minutes in the antifreeze mode.
- ▼ In the absence of radio communication, it switches off the actuator completely.

The 'safety antifreeze' option is useful in cases where not providing any thermal energy to the system could cause the pipes to break.

In the event that a problem occurs in the radio communication with one or more outputs, if the safety antifreeze option has been enabled the outputs in question will be switched on automatically every hour for 18 minutes, supplying 30% power to the system.

DIP-SWITCH 2: Periodic activation of auxiliary output:

- ▲ If the auxiliary output always remains off, it is switched on for 1 minute every 2 days to prevent the pump from being damaged due to inactivity.
- ▼ Function deactivated.

The "periodic activation of auxiliary output" option is useful if the system includes a circulation pump that could undergo damage if left inactive for long periods of time. When this option is enabled, the auxiliary output will be switched on for 1 minute every 2 days. The output will be switched on at the same time as the actuators if the periodic activation function is also enabled for the actuator outputs.

DIP-SWITCH 3: Share auxiliary output:

- ▲ The auxiliary output will be switched on/off according to the status of the channels of all modules connected in a chain.
- ▼ The auxiliary output will be switched on/off according to the status of the channels present on the same module.

If the "share auxiliary output" option is enabled, the relay will be controlled according to the status of the channels of all modules connected in cascade to one another. If the option is disabled, the auxiliary output relay will be switched on or off depending solely on the status of the outputs present on the module to which the relay itself belongs.

DIP-SWITCH 4: Heating/Cooling selection via external input:

- ▲ The Heating/Cooling status is determined by the external Heating/Cooling input.
- ▼ The Heating/Cooling status is determined by the thermostat transmitter.

When the 'Heating/Cooling selection via external input' option is enabled, the external Heating/Cooling contact will determine the operating mode for all thermostat-controlled channels of the module. See the paragraph on 'External Heating/Cooling input' for further information.

If the system you are installing does not require any particular options to be enabled, it is sufficient to leave all DIP-switches in the '0' position.

Heating/Cooling selection

The relay module is factory configured (DIP-switch 4 down) so that that the Heating/Cooling status of each channel will be determined by the setting of the associated thermostat transmitter. However, if a chronostat is present in the system, it will override the thermostat settings and impose its own Heating/Cooling status on all thermostat-controlled channels, including those of other modules connected in cascade to the same active antenna.

This makes it possible to change over the mode selection easily by means of a single device (chronostat) without having to adjust every thermostat individually.

If there is more than one chronostat in the system, the one controlling the lowest channel (in the module closest to the antenna, in the event of a number of cascade-connected modules) will override the others in determining the Heating/Cooling status.

The Heating/Cooling status of a chronostat can never be changed via the relay module: it must always be adjusted manually. The options permitting a global Heating/Cooling changeover apply only for the channels controlled by thermostats.

If the relay module is configured so that the Heating/Cooling status is determined by an external input (DIP-switch 4 up), the thermostat-controlled channels will take on the status defined by the external contact. However, the module cannot change the Heating/Cooling status of any channels controlled by chronostats.

In cases where a chronostat is present in the system, it is not convenient to use the 'Heating/Cooling selection via external input' option since you can change the Heating/Cooling setting of all thermostat-controlled channels simply by changing that of the chronostat.

The status of the external Heating/Cooling input is communicated to all the modules connected in cascade. Therefore, it is not necessary to connect the inputs of several modules in parallel: it is sufficient to connect the switch to one module in the chain in order to change the Heating/Cooling status of all channels in the system.

If a thermostat-controlled channel has been associated with a chronostat, the channel will always take on the Heating/Cooling status of the associated chronostat, irrespective of the setting of DIP-switch 4.

External ' Heating/Cooling ' input

If the 'Heating/Cooling selection via external input' option is enabled (See paragraph on 'DIP-switch options'), the external Heating/Cooling contact will determine the operating mode for all thermostat-controlled channels of the module:

- contact open: heating mode
- contact closed: cooling mode

See the paragraph on "Heating/Cooling Selection" for further information and also in the event that a chronostat is present within the system.

' Global standby ' input

To the "Global standby" input it is possible to connect a

will likewise be set on an antifreeze temperature of 5 °C. The thermostats can have a selector that allows them to be set in the comfort or economy mode according to the time schedule of the associated chronostat, or to override the latter so as to remain always set in the comfort mode or always off. See thermostat instructions. See the chronostat instructions to find out how to program time schedules and comfort and economy temperatures.

In this way a chronostat and the thermostats associated with it will form a 'zone'.

For example, in a home it would be possible to create separate 'zones' for the living area and bedroom area, with room temperatures in each area regulated according to different time schedules programmed on two different chronostats.

Procedure for associating thermostats with a chronostat

Before starting the association procedure, make sure that the address self-learning procedure has been carried out for all thermostats and chronostats of the system.

1. To start the procedure press the association button 'A' for one second.
2. The relay module and all the modules connected to the same antenna will go into the association mode: the LED of each channel will start blinking: it will blink green if the channel is controlled by a chronostat or red if the channel is controlled by a simple thermostat. If the channel is inactive, no address has been memorised and the corresponding LED will remain off.
3. Select the chronostat you want to associate thermostats with by pressing the button of the corresponding channel, whose LED will be blinking green. Once the button has been pressed the green LED will remain steadily lit to confirm the selection. The blinking green LEDs of any other chronostat channels will go off.
4. Now you can choose which thermostats to associate with the selected chronostat by pressing the button of the corresponding channel, whose LED will be blinking red. Once the button has been pressed the red LED will remain steadily lit to confirm the selection. It is possible to associate or disassociate the thermostats by repeatedly pressing the button corresponding to the channel. The red LED of a channel will blink if the thermostat is disassociated and remain steadily lit if the thermostat is associated.
5. By again pressing the button corresponding to the selected chronostat, whose green LED will be steadily lit, the chronostat itself will be unselected and go back to the condition described in step 2, with the LED blinking green. Steps 2 to 5 can be repeated to associate thermostats with all the chronostats in the system.
6. To exit the association mode, press the association button 'A'.

NOTE

The association procedure can be repeated at any time in order to make changes or simply carry out a check. For example, to check which channel a transmitter has or has not been associated with by means of the self-learning procedure, follow steps 1 and 2 and exit with 6.

To check the associations with chronostats, carry out the whole procedure without pressing any buttons corresponding to thermostats in step 4.

The self-learning procedure cancels the association of a channel. Therefore, if the self-learning procedure needs to be repeated for one or more channels, the association procedure will likewise have to be repeated as necessary.

It is possible to associate thermostats with chronostats

whose channels reside in different relay modules, provided they are connected in a chain to the same active antenna.

Checking the signal strength

The device constantly indicates the strength of the radio signal received for each of the eight channels. This makes the whole system simpler to install and adjust and moreover allows the user to carry out an instant check on the quality of the radio communication over each channel.

The signal strength is indicated by each of the 8 output status LEDs. They may light up green, yellow or red depending on the quality of the radio signal received:

Green: The signal received is good or excellent, radio communication is reliable.

Yellow: The signal received is sufficient.

Red: The signal received is weak, communication is not reliable.

The status of the output of an actuator that is currently switched off is signalled with the corresponding LED faintly lit rather than off, so that the quality of the radio signal can always be seen.

The relay module indicates two types of signal quality via the LED of each channel based on:

- An immediate analysis of the last command received
- A long-term analysis of the commands received

The LED will normally indicate the "long-term" signal quality, based on the quantity of correct commands received over the previous 90 minutes of operation. This data is stored in a non-volatile memory, so that it will be possible to check the status of each channel even after a mains power cut or blackout.

At the moment a channel receives a radio command, the corresponding output LED goes off for a brief instant and then immediately back on again. For a brief instant the LED will provide an immediate indication of the last command received, proportional to the strength of the radio signal received.

If a transmitter is in the "test" mode, the corresponding LED on the relay module will always provide only an "immediate" indication of signal strength so that you can instantly assess whether to go ahead with mechanical installation.

If the signal strength is not acceptable, try changing the position of the active antenna or, if necessary, of the transmitter.

Remember that both the transmitter and receiver must be installed away from metal objects or metal-reinforced walls that could weaken the radio signals.

NOTE

The output LED may blink to signal a system fault. In this case the colour of the LED has a different meaning, see the paragraph on 'Actuator output status LEDs'.

Configuring NO/NC actuators

The relay module is set in the factory to control normally closed (NC) actuators but each channel can be individually configured to control a normally open actuator (NA).

- To enter the configuration mode, press the association button 'A' and channel 1 button 'CH1' together for three seconds.
- The LED of each channel will start blinking. The meaning is as follows:
blinking green = NC actuator
blinking red = NA actuator
- Pressing the button corresponding to a channel will change the NO-NC setting and the LED will indicate the new status.
- Press the association button 'A' to terminate the configuration procedure. In any event, after 20 sec of

OVERVIEW

This device is a relay module designed to drive loads (more precisely, electro-thermal valves or circulators) via radio in home or office heating/cooling systems. It features 8 independent channels, each of which can be associated with an independent transmitter (radio thermostat or chronostat). This system is undoubtedly the best solution for all buildings in which wires cannot be laid between thermostats and the heating/air conditioning equipment room.

OPERATION

Each thermostat or chronostat transmitter emits 'radio commands' toward the active antenna according to the heating and cooling requirements of the room where the thermostat is located in and according to the programmed setpoint.

These commands are then received by the active antenna, installed in a suitable position in the room where the boiler or air conditioning equipment is installed.

The active antenna then transmits digital data to the relay module via a data cable so that only the relay associated with the transmitter concerned will switch on or off according to need. Each relay output can be connected to a valve that will control the flow of hot/cold water in the heating/cooling unit present in the room. In addition to the channel outputs, the device features an 'auxiliary' output, which is activated each time at least one of the actuator outputs (channels 1-2: see also 'Pump Operation') is switched on. While it is operating, the relay module continuously monitors the status of each channel in order to detect any transmitter malfunctions.

MECHANICAL DESCRIPTION

On the front panel of the device, shown in Fig. 1, there are four LEDs:

Power LED '⏻' (2 in figure 1).

The green 'power' LED, marked with the '⏻' symbol, can be steadily lit or blinking:

Green LED steadily lit: the device is powered.

Green LED blinking: there is a problem in communication with the active antenna or with other modules connected in the chain (for example, there may be a problem with the data cable connection)

Actuator output '1 - 2' status LEDs (3 in figure 1).

There are 2 status LEDs, each of which corresponds to a channel, and they may light up green, yellow or red.

Each LED provides information about the output and the radio thermostat controlling it.

In general, the following rule should be borne in mind:

- When a LED is lit, irrespective of colour, it means that the corresponding actuator output is ON.
- When a LED is either off or only faintly lit, it means that the corresponding actuator output is OFF.
- The colour of the LED provides information about the quality of radio communication. See paragraph on 'Checking the signal strength'.
- A continuously blinking LED indicates the presence of a fault in the system which requires the user's intervention. In this case the colour of the LED has the following meanings:

Green: Error in the temperature probe of the thermostat transmitter.

Yellow: Thermostat transmitter battery low.

Red: Absence of radio communication.

When a channel is in a fault status and the corresponding LED is blinking, it may blink in two different ways depending

on the output relay status.

If the output is deactivated the LED will normally remain off but then emits a brief flash, whereas if the output is active, the LED will normally remain lit and then go off briefly.

Auxiliary output on/off LED '⏻' (4 in figure 1)

The yellow LED, marked by the '⏻' symbol, indicates the status of the auxiliary output relay.

- LED on: auxiliary output ON (the pump or boiler connected to the relay module is switched on).

- LED off: auxiliary output OFF.

Fig. 2 shows the internal layout of components.

Before opening the enclosure, it is absolutely necessary to make sure that the device is disconnected from the 230V~ mains power supply.

Jumpers JP1 and JP2 Figure 2

If an auxiliary power source is used for the loads, it is necessary to remove the jumpers JP1 and JP2 indicated by 1 and L in Figure 2.

Fuses

The device is protected by an auto-reset thermal fuse.

F1, indicated by H in Figure 2, is a 2A slow-blow fuse serving to protect the loads.

Self-learning and configuration buttons

The device includes 2 self-learning and configuration buttons indicated by B in Figure 2, one for each of the 2 channels (1 - 2), plus an association button 'A' indicated by A in Figure 2.

Trimmers and DIP-switch

Shown in Figure 2 are 2 trimmers (SB 1 - SB 2) used to set the temperature reduction for the economy mode, indicated by D in figure 2, plus a trimmer for setting the auxiliary output delay time (AD), indicated by E in figure 2.

Also present is a DIP-switch, indicated by F in figure 2, for configuring the 'options'.

INSTALLATION

To install the device carry out the following steps:

- Remove the 4 screws indicated by 1 in Fig. 1 and take off the front panel.

- Fasten the base of the device to the wall using the two screw holes indicated by 5 in Fig. 2.

While working with tools in proximity to electronic components, carefully check that the circuit is disconnected from the 230V~ mains power supply and take care not to damage circuits or components.

- Make the electrical connections as explained in the paragraph on 'Electrical connections'.

- Configure the device as directed in 'Configuring the system'.

- Close the device. The cables should be 'bent' as shown in Fig. 3 and made to pass through the cable glands 6.

If you use a cable entry and its respective cable gland, you will have to remove the plastic tab 7 in Fig. 3 with suitable pliers to open the passage for the cable. Then reposition the front panel on the enclosure and fasten in place with the four screws 1 in Fig. 1.

ELECTRICAL CONNECTIONS

This sections illustrates how to connect the relay module correctly: carefully read the directions below and refer to Fig. 4, which shows the arrangement of the terminals and how they are connected internally.

Terminals 1 and 2 are power inputs: connect them to the 230V~ mains supply, making sure that terminal 1 is

connected to Neutral. The electronic circuit is internally protected by means of an auto-reset thermal fuse, while the loads are protected by the 2A slow-blow fuse, **F1** indicated by **H** in Fig. 2. Terminals 13 and 14 are inputs for the auxiliary power supply of the actuators and terminals from 3 to 6 are the 2 actuator outputs. The module leaves the factory with jumpers in place to connect terminals 13 and 14 to the power supply line (230V~) and can therefore directly power the loads connected to its terminals 3 to 6, as shown in Fig. 4. In this case the auxiliary power supply must not be connected to terminals 13 and 14 and the loads will be powered by the 230V~ mains supply.

If the actuators need to be powered at a different voltage (for example if a load operates at 24V~) the receiver must be slightly modified as follows:

- Cut jumper wires **JP1** and **JP2**, **I** and **L** in Figure 2, and remove them completely. This operation serves to disconnect the 230V~ power supply from the internal line for powering the loads.
- Connect an external power source (e.g. a transformer with a 24V~ output) to terminals 13 and 14 (Fig. 4).
- Connect the actuators to be controlled to terminals from 3 to 6. These loads must be suitable for the voltage supplied to terminals 13 and 14.
- Check the rating of the protection fuse **F1**: it must be sized according to the maximum total current of the loads (see below).

The user must take account of the energy consumption of the loads and make sure that the external power source is capable of supplying the total power necessary in the worst possible situation (i.e. when all loads are switched on). For example, if you use 2 actuators each requiring 3W at 24V~, it will be necessary to provide an external transformer with a 24V~/6W output (3W x 2 actuators). A safety margin of at least +10% is strongly recommended: in the preceding example, this would mean using at least a 8W transformer. The slow-blow protection fuse supplied, **F1**, has a trip value of 2A, which is suitable for 4 standard 230V~ actuators. If you need to connect a larger number of actuators or 24 V~ actuators, you should replace fuse **F1** with one having a higher rated trip current. The fuse should be sized so as to withstand the inrush current of the actuator; in case of need, ask your local retailer for further information. Terminals 7 and 8 are the auxiliary output terminals for connecting a circulating pump or boiler.

These are voltage-free contacts (not powered) so that you can use a pump or boiler that works at various voltages. The diagram in Fig. 4 illustrates the connection of a circulation pump. Terminals 9, 10 and 11 (Fig. 4) are respectively the external 'Global standby', 'Heating/Cooling' and 'Economy' inputs that can be closed at terminal 12 to activate the associated function. The status of the external inputs are communicated to all modules connected in the chain, so it is not necessary to connect the inputs of several modules in parallel. For example, it is sufficient to connect the switch to a single module in the chain in order to change the Heating/Cooling status of all channels in the system.

In the plug labelled 'Signal IN' must be connected the cable coming from the active antenna. The 2 channels relay module can also be connected in a chain fashion to a 8 channels relay module so that all the units of the chain will use the same active antenna. In case the unit is to be connected in a chain fashion, an interconnection cable must be plugged between the 'SIGNAL OUT' socket of a 8 channels relay module and the 'SIGNAL IN' socket of the 2 channels relay module. See the wiring examples in Fig. 5 and Fig. 6. The module must be the last unit in the chain since it does not have a 'SIGNAL OUT' socket connector on

the board. For the same reason several 2 channels units cannot be connected together in a chain. Up to 10 relay modules can be connected together in a chain.

TECHNICAL DATA

Power supply:	230V~ -15% +10% 50Hz
Input power:	4 VA
Contact rating:	
Actuator outputs:	2 x 3A@250V~, voltage contacts Max total 6A
Auxiliary output:	3A@250V~, voltage free
Device protection fuse:	Thermal auto-reset.
Load protection fuse:	2A slow blow
Economy reduction range:	0.0 .. 7.0 °C
Auxiliary output delay:	0 .. 7 min
Antifreeze temperature:	6.0 °C
Regulation hysteresis:	0,3 °C
Protection rating:	IP 30
Operating temp.:	0°C .. 40°C
Storage temp.:	-10°C .. +50°C
Humidity limits:	20% .. 80% RH (non-condensing)
Enclosure: Material:	ABS V0 self-extinguishing
Colour:	Signal White (RAL 9003)
Dimensions:	130 x 100 x 60 mm (WxHxD)
Weight:	~ 570 gr.
EMC reference standards:	EN-55014-2 (1997) EN-55014-1 (2000)
LVD reference standard:	EN-60730-1 (1996)

⚠ WARNING

- Connect the device to the mains power supply via an omnipolar switch complying with current regulations and having a contact gap of at least 3 mm in each pole.
- Device installation and electrical connections must be entrusted to qualified personnel and must comply with the laws in force.
- Before making any connections make sure the mains power is disconnected.

CONFIGURING THE SYSTEM

The receiving system is made up of at least one 'active antenna' and one 'relay module'. Several relay modules can be connected in cascade to increase the number of available outputs. Carefully make the power connections and output connections on the device and then, with the power supply still disconnected, plug the cable for connecting the active antenna to the relay module into the corresponding sockets. In the socket 'Signal IN' must be connected the cable of the active antenna, or the output signal of a 8 channels relay module if the system requires a chain of relay modules. Carefully inspect each connection and then continue with the self-learning procedure.

Self-learning procedure

- Switch on the relay module: the LEDs will blink for a few seconds during the initialisation phase.
- Switch on a single thermostat or chronostat and set it in the 'test' mode (this means that the transmitter will continuously emit an ON command followed by an OFF command after three seconds). It is advisable to keep the transmitter in the same room as the receiver, positioned at a distance of no less than 1 metre from the active antenna.
- In order to link each individual transmitter to the desired receiving channel it is necessary for the module to learn the transmitter 'address' code, which will be stored in a

non-volatile memory. To carry out this procedure simply press the button corresponding to the channel you want to 'associate' with the transmitter for one second during the 'test' phase.

This will launch the 'self-learning' procedure and the LED of the channel in question will rapidly blink yellow. If you wish to memorise the address of the same transmitter on several channels you can press the button of the other channels and the corresponding LEDs will blink yellow.

- As soon as a test command is received, the LED associated with the channel will remain steadily lit yellow for 7 seconds. During this time the module will continue to receive test commands and memorise only the signal received at the highest strength. This means that it will memorise the signal coming from the nearest transmitter and will thus avoid learning addresses from any transmitters in the test mode which are not meant to be connected to the system.
- After 7 seconds have elapsed the procedure will be terminated and the corresponding LED will blink red-green -red-green in sequence to indicate that the transmitter address has been saved.
- The module will resume normal operation and the output relay of the channel for which the address has been memorised will immediately start to switch ON and OFF following the commands emitted by the transmitter in the 'test' mode. Using the 'test' function it is advisable to check the strength of the signal received once the transmitter has been placed in the desired position. To avoid wrong indications due to overlapping signals, do not test more than one transmitter at a time.
- After verifying that the signal strength is satisfactory, you may proceed with the final mechanical and electrical installation.

NOTES

The device can indicate which channels an address code has or has not been associated with. See paragraph on 'Procedure for associating thermostats with a chronostat'.

If the system uses fewer than two thermostats and therefore does not use all of the outputs, it is important to keep the unused channel 'inactive' by not assigning it an address code. The device will ignore the inactive channel, since it is not connected to any valve: this configuration is very important to ensure the correct control of the auxiliary output for the circulation pump.

Configuring a channel as 'inactive'

The relay module has all channels in an 'inactive' status when it leaves the factory; however, if an active channel needs to be configured as 'inactive', the address assigned to it can be 'erased' by means of the following procedure:

- Press the button corresponding to the desired channel (Figure 2) and keep it pressed down.
- The corresponding LED will rapidly blink yellow and after a few seconds it will blink red-green-red-green in sequence.
- Release the button: the channel is now inactive.

When a channel is 'inactive' it will be ignored for all functions and its respective relay will always remain off, irrespective of the signals received. Making a channel inactive will also have the effect of cancelling any association with a chronostat.

Resetting to factory status

If you want to erase all of the memorised addresses, associations with chronostats, NO/NC configurations and

periodic activation of outputs, thus restoring the module to its original factory status, you can carry out a reset procedure as follows:

- Disconnect the power supply.
- Press the association button 'A' (Figure 2) and keep it pressed down.
- Switch the power back on.
- Continue pressing the association button 'A' (about 3 sec) until the output LEDs start blinking like they normally do when the device is switched on.
- Release button 'A'; the module will restart and the memory of each channel is erased.

Auxiliary output for pump or boiler

The relay of the auxiliary output is activated each time at least one actuator output is switched on. If the 'share auxiliary output' option is enabled (see paragraph on 'DIP-switch options') the relay will be controlled according to the status of the channels of all modules connected in cascade to one another. If the option is disabled, the relay will be activated based solely on the status of the outputs of the module the relay itself belongs to. It is possible to set a delay in the on/off switching of the auxiliary output. The delay may be set in the range of 0 to 7 minutes by adjusting the trimmer indicated by **E** in figure 2. This will permit the output to control a pump, which will wait for the electro-thermal actuators to open before starting to circulate water and continue after all actuators have been switched off, until they are completely closed. If a pump is controlled by the module, it is useful to enable the "periodic activation" option (see paragraph on 'DIP-switch options').

Associating thermostats with a chronostat

Through radio signals the thermostats transmit to the relay module the current room temperature reading and setpoint programmed on the knob. Accordingly, the relay module can decide whether to adjust the setpoint downward for the "economy" function, which allows the temperature to be regulated so as to save energy in certain periods of the day. This function allows the temperature in the room where the thermostat is installed to be regulated according to two setpoints: comfort and economy. The comfort setpoint corresponds to the temperature set on the knob, whereas the economy setpoint is equal to the comfort temperature minus a fixed reduction value in the heating mode (in the cooling mode Tcomfort + fixed reduction value). The relay module has 2 trimmers, indicated by **D** in figure 2, by means of which it is possible to adjust the fixed reduction value between 0 and 7 °C.

Each trimmer allows you to set the amount of the temperature reduction for the relevant channel: trimmer SB1 sets the reduction on channel 1 and trimmer SB2 sets the reduction on channel 2.

The economy mode can be activated by the external 'Economy' input via an override command or controlled by an associated chronostat. The device permits one or more thermostat-controlled outputs to be associated with the output of a chronostat, so that the associated channels will receive from the chronostat an indication as to the time of day and information about which setpoint – comfort or economy – should be used to regulate the room temperature. The OFF or antifreeze status is likewise received by the associated thermostats.

If the chronostat is currently set in the comfort mode, the associated thermostats will abide by the setpoint set on their respective knobs; if, on the other hand, the chronostat is currently set in the economy mode the associated thermostats will apply the temperature reduction as described above. Similarly, if the chronostat is off with the antifreeze function set on 5 °C, the associated thermostats