Internal configuration



ON : It stays on and then it turns off while the device is transmitting.



LINK : It shows that the local device and the remote one are connected to each other.



ERR : It lights up when it receives an invalid signal.



AN.E : Analog input signal failure. The value of the signal is lower than 4mA (model THR420).



RL1 : Relay output 1 on.

RL2 : Relay output 2 on.



BAT. LOCAL : Low battery detected in the device located in front of us.



BAT. REMOTE : Low battery detected in the remote device. It allows to check the battery level without any travel to location.



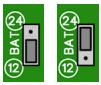
ADDRESS Selector : Binary address of the device. Both local and remote devices must have the same adress. We recommend to change the code set in factory.



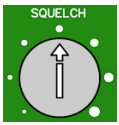
POWER Selector :

HIGH : The device is always active.

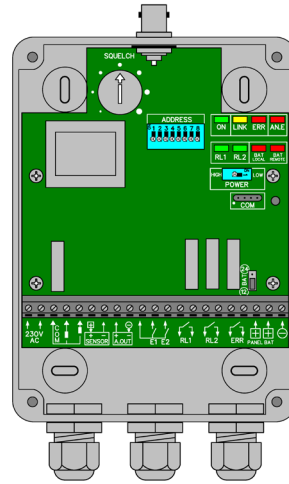
LOW : The device is activated only from time to time in order to save battery.



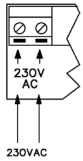
BAT Selector (jumper) : It allows to configure the device for charging a battery of 12Vdc or 24Vdc.



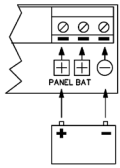
SQUELCH Adjustment: It allows to select the accuracy of the reception.
If we increase this adjustment then the reception distance increases, but we will also receive more radio noise.
When the ERR pilot remains switched on, it means that there is a lot of radio noise that slows the running of the device. To avoid it, the SQUELCH adjustment must be reduced until we see the pilot light goes off a few times.



MAIN SUPPLY : This device can be supplied in several different ways.

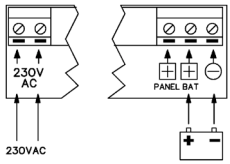


230V AC Supply : Wire the cables L and N to these 2 terminals. Do not connect the power ground to the equipment.



Direct current : The device can be supplied with an external battery of a certain capacity. It must be connected between the terminals “+ PANEL” (positive wire) and “-“ (negative wire). The battery connected here is never recharged by the device, even if it is powered to 230V.

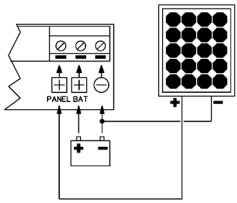
We can, for exemple, connect here a 9V alcaline battery to supply the device when the main supply fails (backup).



AC Supply and rechargeable battery : When using the 230V power supply, a battery can be connected between terminals “+BAT” and “-“. The battery charges while power is 230V. When 230V power supply cuts, the battery will supply the device. Do not connect the power ground to the equipment.

It can be used:

- One 12V lead battery (charging selector in position12V).
- Two 12V lead battery connected in series (charging selector in position 24V).
- 10 rechargeable batteries NI-MH type AA size (2200mAh) connected in series (charging selector in position 12V).



Solar Panel and rechargeable battery : The device can be supplied by an external solar panel connected between the terminals “+ PANEL” (positive wire) and “-“ (negative wire). We can also connect a battery between terminals “+BAT” and “-“. The battery charges while there is sunlight. At night, the battery will supply the device.

BATTERY CHARGING : 230Vac main supply as well as the solar panel charge the battery connected between the terminals “+BAT” and “-“ .

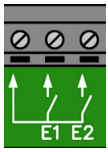
You must set the battery voltage in the voltage selector, otherwise the battery may be overcharged or charge is not reached.



Selector (jumper) in the lower position for 12V lead battery.



Selector (jumper) in the upper position for 24V lead battery.



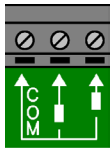
DIGITAL INPUTS

We can connect 2 voltage-free digital inputs on this device.

E1 is an inverted type input. When opened, it activates relay RL1 on the remote device.

This is especially useful in security systems, where we want to trigger an alarm when the circuit is opened up.

E2 is a normal input. When closed, relay RL2 is activated in the remote device.

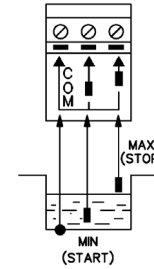


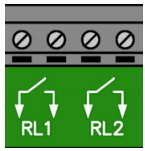
LEVEL CONTROL RELAY INPUT

For the level relay input to work, the device must be powered at 230Vac.

It is essential to connect the common to a probe submerged in the bottom.

When the level lowers and low level probe is exposed, the level relay is activated and closes relay RL1 on the remote device. If the water level rises up to touch the maximum level probe RL1 relay output is disabled on the remote device.





RELAY OUTPUTS

RL1 relay output closes when the remote device opens the input E1 or activates its level relay.

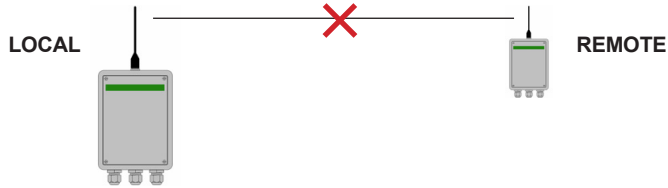
RL2 relay output is activated when the remote device closes input E2.

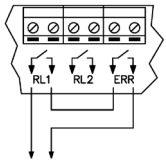
The relay outputs are persistent type, ie if communication is interrupted they remain in the state in which they were.



ERROR RELAY

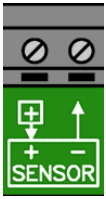
This output is opened when the LOCAL device loses communication with the REMOTE device (LINK light off).





How to use an output in safe mode

If the output of one of the relays is interspersed with this contact, in case of connection failure, the output is cut.

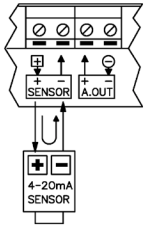


ANALOG INPUT (only available on model THR420)

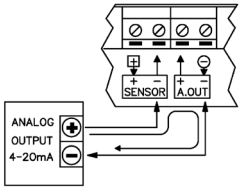
We can connect any device with 4-20mA output to this input. The read signal value is transmitted via radio to the REMOTE device.

When this device powers the current loop by the “+ SENSOR” terminal, if power is 230Vac, the voltage supplied will be 24V.

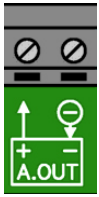
If the device is battery powered, the voltage reaching the sensor is the same as battery has so if we want to use a sensor that needs 24V we need our battery to be 24V.



PASSIVE 4-20mA sensor, powered by the device itself. This is the typical connection where the device supplies the sensor directly. In LOW POWER mode only powers the sensor for few moments while taking a measurement.

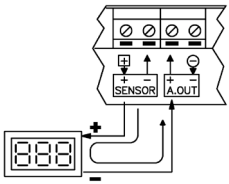


ACTIVE analog output. The external device powers the current loop and the device is inserted in this current loop.

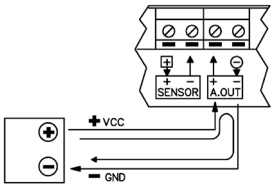


ANALOG OUTPUT (only available on model THR420)

The analog output reproduces the analog signal connected to the analog input of the REMOTE device.This output is persistent type, ie keeps the value when communication between local and remote device is cut.



ACTIVE 4-20mA output. The unit powers the current loop. The device connected to is passive and it is only inserted in the loop.



PASSIVE 4-20mA output, powered from an external source. The external device supplies power to the current loop, our device acts as a passive 4-20mA sensor.

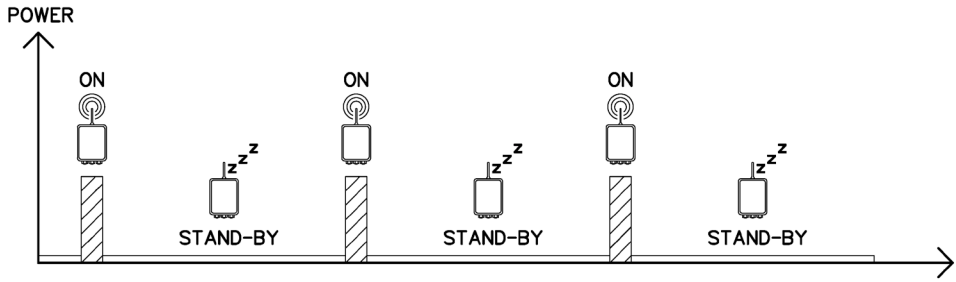
LOW POWER mode, to reduce power consumption and increase battery life.

Sometimes it is necessary to transmit an analog signal from a sensor located in a place without main supply. In this case we have to put a battery to power it.

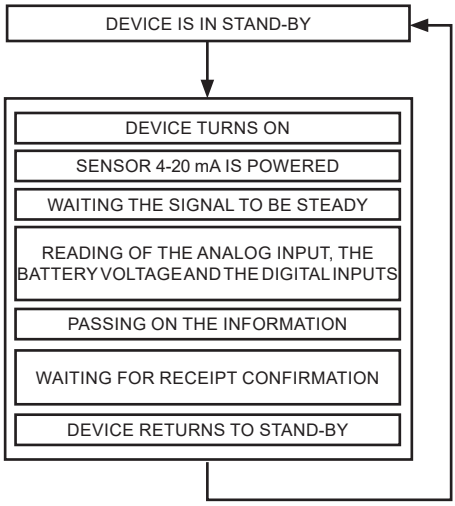


4-20mA sensors can consume up to 20mA what, in addition to consumption of the device itself, would make battery power impossible.

If we put the power selector to LOW POWER position, the device works on energy saving mode. It is only activated shortly from time to time, which greatly extens the battery life.



The repeated process is as follows :



Things to consider in LOW POWER mode

To save the most energy, relay outputs and analog outputs are always inactive.

Pilots only light up while the device is active.

The time that remains active depends on what it takes to:

A) Having a stable reading from the analog input (THR420).

B) Communicate with the remote device and send the data.

For this mode to work, it is imperative that the other device is in **HIGH POWER** mode.

If the device is in stand-by in LOW POWER mode and the switch is in HIGH POWER position, wait that the device activate by itself so that it is always on (about 15 s).

Technical specifications

Power	230V AC, 9 to 40V DC (7 to 40V DC LOW POWER mode)
Operating frequency	433.92MHz
Transmission power	10mW
Antenna	50Ω with BCN connector
Inputs/outputs	2x voltage-free digital inputs 1x Level relay input with 2 probes 2x relay outputs (max. 250V / 5A) 1x error output (max. 250V / 5A) 1x 4-20mA analog input (THR420 model only) 1x 4-20mA analog output (THR420 model only)
Battery charging voltage	Selector (jumper) on 12V : 14.1V Selector (jumper) on 24V : 27.4V
Battery load current	62mA maximum
Low battery warning voltage	11.85V with battery connected in input +BAT 12.6V with battery connected in input +PANEL
Activation frequency in LOW POWER mode	approximately every 15 seconds
Consumption	0.8VA to 2.4VA when powered at 230V AC Minimum / Medium / Maximum 24V HIGH POWER: 31mA / 69mA / 106mA 12V HIGH POWER: 24mA / 58mA / 92mA 24V LOW POWER: 5.99mA / 7.56mA / 9.094mA 12V LOW POWER: 2.49mA / 3.99mA / 5.49mA
Theoretical estimated battery life in days	Battery capacity **0.8Ah** / **1.2Ah** / **2.8Ah** / **5 A h** **24V** LOW POWER: 3 to 5 / 5 to 8 / 12 to 19 / 22 to 34 **12V** LOW POWER: 6 to 13 / 9 to 20 / 21 to 46 / 37 to 83
Size/Weight/IP/Temperature	195 (height) x 110 (width) x 70 (depth) / 1,440g / IP56 / -10º...+55ºC.

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