

## TIR Two



TIR Two (Temperature Inputs Relays) is a digital signals and impulse centralizer. In only 4 DIN modules, the unit has 2 relay outputs, 2 voltage free digital inputs and 2 NTC/PTC inputs for temperature sensors.

The device works with LoRa™ protocol for long range radio communications, with maximum communication's range of 1 km indoor and up to 20 outdoor with direct line of sight.

All setup in radio communications is done using the dip-switch located in the lower part of the device. Once the configuration is completed, **TIR Two** devices connect automatically with **Gateway LR** for a fast and easy installation.

### TECHNICAL CHARACTERISTICS

<b>Power circuit</b>	
Input voltage	110 ... 264 Vac
Frequency	47 ... 63 Hz
Maximum consumption	2,5 ... 4,5 VA
<b>Environmental conditions</b>	
Temperature range	-10 .... +60°C
Humidity range	5 .... 95%
<b>Mechanical characteristics</b>	
Enclosure material	Plastic UL94 – V0 Self-extinguishable
Protection grade	IP20
Unit dimensions (Width x Height x Length)	18 x 70 x 109 mm
Weight	70 g
Mounting	DIN Rail (1 module)
Maximum working altitude	2000 m
<b>Radio communication</b>	
Protocol	LoRa™
Frequency	868 / 915 MHz configurable
External antenna connector	Yes
External antenna connector type	SMA female
Autosync sensor-gateway	Yes
<b>Temperature metering</b>	
Probe type	NTC/PTC
Number of probes included	1
<b>Digital inputs characteristics</b>	
Type	Free voltage
Maximum activation current	5 mA
<b>Outputs characteristics</b>	
Type	Relay
Nominal voltage	250 Vac
Electrical endurance	3 x 10 <sup>4</sup> operations (5 A A.C.)
Nominal current	
With resistive charge	250 Vac / 5 A A.C.
With inductive charge (CA)	250 Vac / 2 A A.C.
With inductive charge (CC)	24 Vdc / 5 A D.C.
<b>Characteristics and electrical security</b>	
Security	CAT III 300 V under EN 61010
Electric shock protection	Double insulation class II
<b>Standards</b>	
Standards	UNE EN 61010-1:2010, UNE-EN 61000-6-2, UNE-EN 61000-6-4

## INSTALLATION

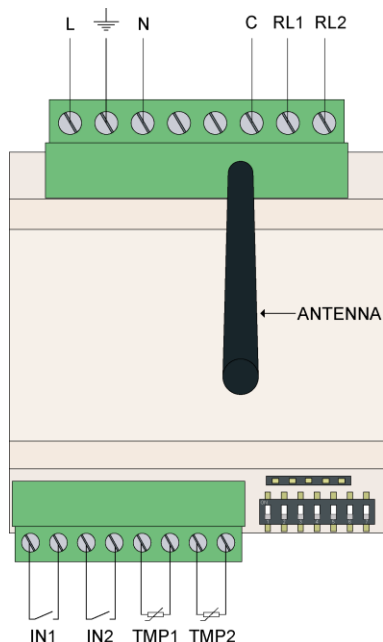
TIR Two has been designed for DIN rail mounting.



### IMPORTANT

Take into account that when the device is connected, the terminals may be hazardous to the touch, and opening the covers or removing elements may provide access to parts that are dangerous to the touch. Do not use the device until it is fully installed

## CONNECTIONS AND LEDS



Led	Description
1	<b>Power</b> - Activity: Green
2	<b>RX</b> - Activity: Green
3	<b>TX</b> - Activity: Green

## LORA™ COMMUNICATION

The device comes equipped with LoRa™ radio technology wireless communication for private networks. This devices are only for private networks and can't be connected to LoRaWAN networks.

The frequency for Europe is free ISM band 868 MHz but the device incorporates 9 different channels between 865,1 MHz (channel 0) and 869,85 MHz (channel 9). Default frequency is fixed to 869,525 MHz (channel 7). In addition, 915 MHz (channel 10) frequency is also available for networks in USA, Canada, Australia, Singapore or Israel.

In reference to **transmission and reception mode**, the device includes 10 modes to choose between 300 bps and 21875 bps considering that increasing bitrate affects to signals coverage. Communication modes are chosen using the dip-switch.

The following table shows the properties of each mode:

Mode	Bits per second	Commentaries
0	292,97 bps	<i>Maximum distance. Minimum bitrate. Default mode.</i>
1	585,94 bps	-
2	976,56 bps	-
3	1171,88 bps	-
4	1953,13 bps	-
5	2148,44 bps	-
6	3515,63 bps	-
7	7031,25 bps	-
8	12500 bps	-
9	21875 bps	<i>Minimum distance. Maximum bitrate.</i>

## ALARMS CONFIGURATION

The configuration of temperature alarms is based on an activation and a deactivation value exceeded during a chosen time, for example, a fridge that exceeds 5°C during 30 minutes.

Similarly, open and closed contact alarms will be notified after a change of state of a digital input during a configured time.

## MAP OF VARIABLES

Magnitude	Symbol	Unity	R or RW
Hardware version			r
Software version			r
Serial number			r
Data sending rate		s	rw
Digital input 1 mode			rw
Digital input 2 mode			rw
Impulse duration		ms	rw
Maximum temperature threshold		°C x 10	rw
Maximum temperature alarm time		s	rw
Minimum temperature threshold		°C x 10	rw
Minimum temperature alarm time		s	rw
Digital input 1 alarm value			rw
Digital input 1 alarm time		s	rw
Digital input 2 alarm value			rw
Digital input 2 alarm time		s	rw
Instant temperature probe 1	TINS1	°C x 10	r
Average temperature probe 1	TAVG1	°C x 10	r
Maximum temperature probe 1	TMAX1	°C x 10	r
Minimum temperature probe 1	TMIN1	°C x 10	r
Instant temperature probe 2	TINS2	°C x 10	r
Average temperature probe 2	TAVG2	°C x 10	r
Maximum temperature probe 2	TMAX2	°C x 10	r
Minimum temperature probe 2	TMIN2	°C x 10	r
Digital input 1	IN1		r
Digital input 2	IN2		r
Relay 1	OUT1		rw
Relay 2	OUT2		rw

## MODEL REFERENCE

Model	Reference	Protocol	Communication
TIR Two	C005	LoRa™	Radiofrequency

## TEMPERATURE PROBE REFERENCE

In case that an extra temperature probe is needed:

Model	Reference	Cable length	Connection type
Probe NTC 15	E002	1,5 meters	2 wires
Probe PTC 15	E003	1,5 meters	2 wires

## EXTERNAL ANTENNA REFERENCE

In case that an external antenna is needed:

Model	Reference	Cable length	Connector type
External antenna	E001	2 meters	SMA

## **SAFETY PRECAUTIONS**



### **DANGER**

Warns of a risk, which could result in personal injury or material damage caused by an incorrect handling or installation of the unit. In particular, handling with voltages applied may result in electric shock, which may cause death or serious injury to personnel. Defective installation or maintenance may also lead to the risk of fire. Read the manual carefully prior to connecting the unit. Follow all installation and maintenance instructions throughout the unit's working life. Pay special attention to the installation standards of the National Electrical Code.

## **DISCLAIMER**

PickData, SL reserves the right to make modifications to the device or the unit specifications set out in this instruction manual without prior notice.

PickData, SL on its web site, supplies its customers with the latest versions of the device specifications and the most updated manuals.

## **MAINTENANCE AND TECHNICAL SERVICE**

Device doesn't require maintenance.

In the case of any query in relation to unit operation or malfunction, please contact the PickData, SL technical support service.

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