Marconi – LINK T2 - LORA

Long Range, Low Energy Consumption Radio Link

Code APE-519/0025 User Manual - *Vers.1.0*

The LINK T2 Marconi is a transceiver designed for long-range communication using variable-code encoding. In combination with the LINK R2, it enables the control of two relays in pulse, bistable, and timed modes, while also providing relay status feedback and radio link quality indication.
It provides three different operating modes:
- Continuous: the LINK R2 relays follow the status of inputs A and B of the LINK T2.
- Remote control: allows control of relays A and B using the monostable, bistable and timer programming options.
- State-change mode: similar to Continuous mode, but transmission and acknowledgements only occur when inputs A and B change state and at predefined intervals, in order to comply with the RF bandwidth occupancy limits specified by EN 300 220-2.

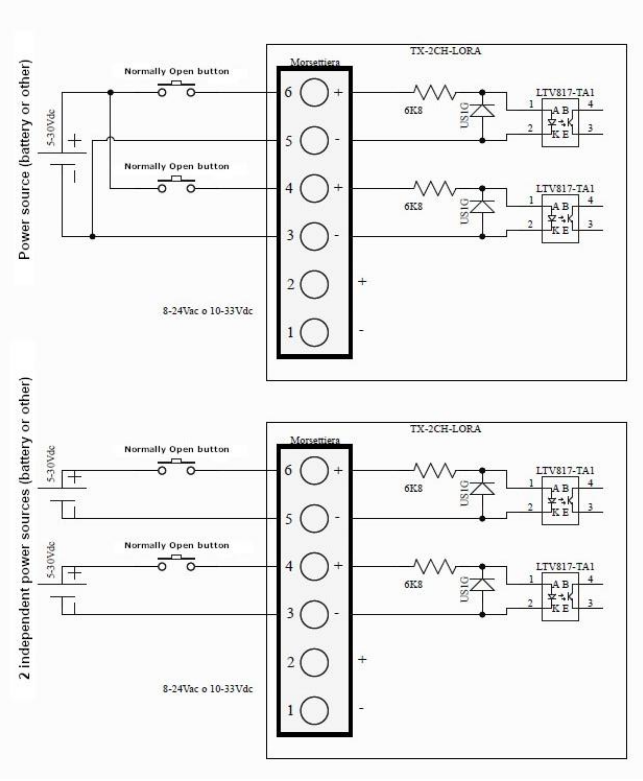
The unit is housed in a plastic enclosure designed for wall mounting. It features two buttons for programming and two RGB LEDs used to indicate operating status, programming status, and acknowledgements from relays A and B of the LINK R2. A red LED indicates the power supply, which must be within the range of 8–24 Vac or 10–33 Vdc.

Connections are made using 3.81 mm-pitch pluggable terminals, suitable for wires with a nominal cross-section of up to 1.5 mm^2.

Connections

No.	Name	Description
1	Power Positive	Connect to 8-24Vac or +10÷33Vdc power supply.
2	Power Negative	Connect to the negative pole of the power supply or GND.
3	Input + Opto B	Positive input for channel B activation. Activated with +5÷30Vdc.
4	Input - Opto B	Negative input for channel B activation. Connect to GND or negative.
5	Input + Opto A	Positive input for channel A activation. Activated with +5÷30Vdc.
6	Input - Opto A	Negative input for channel A activation. Connect to GND or negative.
7	Antenna Ground	Connect to the 50Ω coaxial cable shield or GND.
8	Antenna	Connect to a 50Ω single-pole antenna or the central pole of a coaxial.

Wiring examples for a button connected to the opto-isolated input of the TX-2CH-LORA



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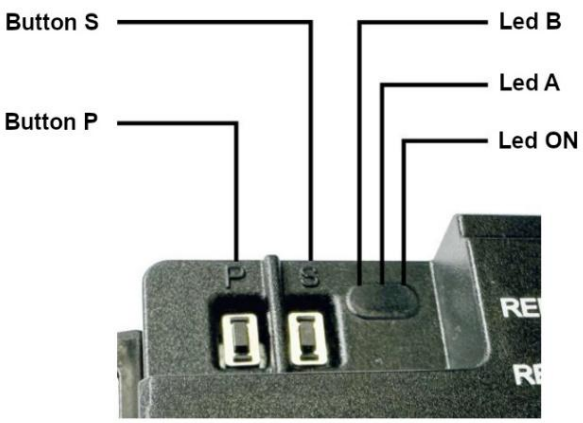
Buttons and LEDs



In the upper-left corner of the enclosure there is a recess housing two clearly visible buttons, which can be operated with the index finger or an insulated tool, identified as Button P and Button S. To their right, a transparent window in the enclosure allows the three LEDs to be viewed.

The following table lists the names and main functions of the LEDs and buttons:

Name	Description
Led ON	Red LED: blinks for 1 second at power-up, then every 2 seconds to indicate the board is on.
Led A	RGB LED: indicates the operating status of the associated relay RX output.
Led B	RGB LED: same as LED A for relay B.
Button S	Configures operating mode. Details are explained in later sections.
Button P	Indicates radio link status, also used for exiting the menu.

Control unit activation

After powering up, the three LEDs flash for 1 second: A and B flash white, ON flashes red.

Under normal conditions, LEDs A and B remain off, while the ON LED flashes every 2 seconds.

First starting operation

In factory-default conditions, the LINK T2 remains in standby with an average current consumption of 7 mA at 12 V; the radio section is disabled until one of the two opto-isolated inputs, A or B, is activated.

If LINK T2 is not yet connected to a LINK R2, applying power to the + Opto and - Opto terminals of inputs A or B will start transmission and the LED of the corresponding channel (LED A for Opto A, LED B for Opto B) will light up red for the entire duration of activation, with interruptions caused by the absence of a response from an associated receiver.

Operating mode configuration

The unit provides three different operating modes. To access the menu and select the desired mode, press the S button for 5 seconds. The ON LED will begin to flash in a series of sequences, as shown in the table below, to indicate the operating mode:

1) 1 flash = CONTINUOUS
2) 2 flashes = REMOTE CONTROL
3) 3 flashes = STATUS CHANGE

Press the **S button** again to navigate between modes, each time you press the button, the ON LED will flash more frequently, from 1 to 3, and then resume the single flash sequence.
Once you have selected the desired mode, you can exit the menu by pressing the P button.
The device configuration is sent to the decoder via radio communication.
The factory default setting for the LINK T2 is CONTINUOUS mode.

CONTINUOUS mode: when Opto input A or Opto input B (or both) is activated, transmission starts and keeps the corresponding LINK R2 relay, A or B, active for the entire duration of the transmission. If additional inputs are activated during transmission, they are forwarded to the corresponding outputs. After approximately 200 ms, status LEDs A and B will flash rapidly in cyan to indicate that the command has been received.
They will be red if the transmission has not been received. In Continuous mode, during association, the acquisition of one TX-2CH-LORA input automatically involves the acquisition of the other, assigning inputs A and B of the TX to the corresponding relays A and B of the RX-2CH-LORA.

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REMOTE CONTROL mode: in this mode, the LINK T2 functions as a remote control; the configuration settings of the LINK R2 relays are reflected on LEDs A and B of the LINK T2, namely:

1. Impulsive output: the LED turns blue and flashes rapidly after approximately 200 ms when the command is received; if it is not received, the LED turns red.
2. Bistable output: the LED remains solid blue (2 s) when the output is active, solid red (2 s) when it is inactive; it flashes rapidly if no ACK is received from the decoder.

In Remote Control mode, automatic learning is not provided as in the previous case; each input of the TX-2CH-LORA can be associated with any output of the RX-2CH-LORA.
It is not possible to activate relays A and B simultaneously with a single input.

STATUS CHANGE mode: each time there is a change in one of the LINK T2 Opto inputs, a packet is transmitted reporting the update with the status of both inputs.
If there are no status changes, the LINK T2 still sends an update at 30-second intervals.
The LEDs representing the status of the outputs are updated each time an ACK is received from the RX-2CH-LORA as follows:

1. Steady green LED = output ACTIVE
2. Steady red LED = output INACTIVE
3. Rapidly flashing red LED = no feedback received

Unlike the previous modes, LEDs A and B on LINK T2 remain constantly illuminated according to the three cases described above, continuously displaying the status of relays A and B on LINK R2.
The same learning rules as in Continuous mode apply: registering one input of the LINK T2 automatically registers the other, mapping inputs A and B of the T2 to relays A and B of the LINK R2.

NB: To connect multiple LINK T2 units to the same LINK R2 unit, use Remote Control mode.
Continuous and Status Change modes are designed for operation in pairs between a single LINK T2 unit and a LINK R2 unit.
If multiple LINK T2 devices are paired with the same LINK R2 device, the mode settings defined during the learning process for the last LINK T2 device remain active.

RADIO LINK TEST: by holding Button P for 5 seconds, the radio link quality test is started (a TX-2CH-LORA can be associated with only one RX-2CH-LORA). During this phase, the two status LEDs flash alternately in red; multiple packets are transmitted and, based on the feedback received, the link quality is indicated as follows:

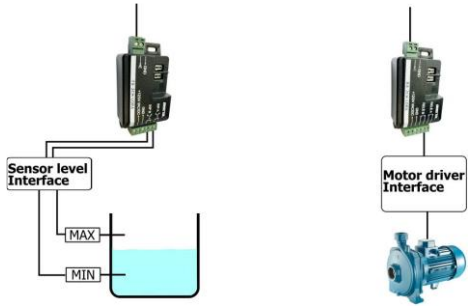
1) 2 steady green LEDs = EXCELLENT quality
2) 2 steady yellow LEDs = FAIR quality
3) 2 steady red LEDs = POOR quality
4) 2 flashing red LEDs = NO CONNECTION

Technical Specifications

	Min.	Typ.	Max.	Unit
Voltage Supply AC/DC				
Voltage DC	10	12	33	V
Voltage AC	9		24	V
Idle current consumption input A and B open (+Vs 12V)		7,5		mA
Current consumption during RF transmission with one or both active inputs (+Vs 12V)	22		30	mA
Vdc voltage between inputs +Opto and –Opto (A, B)	4		35	V
Current consumption input A or B between +Opto and –Opto (+Vs 12Vdc)		1,6		mA
Frequency		869,525		MHz
RF Power	19		22	dBm
RF Modulation		LORA™		
Receiver sensitivity		-127		dBm
Operating temperature	-20		+70	°C
Stock temperature	-40		+100	°C
Size with connectors		77x42x18		mm

Application example: Status change mode

The following is an application diagram that uses the Status Change mode. It involves the activation of a pump via radio which, based on the status of level sensors, determines when to start and stop the motor.



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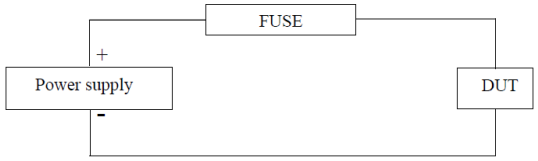
Remote control mode application example

The diagram below illustrates how to integrate a LINK R2 into an existing gate automation system, using the power supply and start contact to command the automation control unit. Up to 100 devices, including remote controls and LINK T2s, can be combined, operating in parallel with the automation system's integrated radio system.

Reference regulations

The device complies with the following harmonised standards:
- EN 62479
- EN 62368-1
- EN 301 489-3
- EN 300 220-2 Receiver class: 2

Regarding electrical safety (EN 62368-1), the product is considered a sub-assembly: the assembler is responsible for integrating it into the final equipment in order to ensure its overall safety. The device must be connected to external circuits classified as ES1 and powered by a source (battery or power supply) that is also ES1, complies with EN 62368-1 and is equipped with short-circuit protection.



Example of short-circuit protection

It should also be noted that EN 62368-1 requires sealed portable secondary cells and batteries (non-button type) containing alkaline electrolyte or other non-acid electrolytes to comply with IEC 62133.

EU Declaration of Manufacturer's Conformity

The manufacturer AB Tecno S.r.l. declares that the radio equipment model LINK T2 – LORA complies with Directive 2014/53/EU (RED).

The device operates at a frequency of 869.525 MHz (ISM band 869.4–869.6 MHz) with a maximum radiated power of 20 dBm. The equipment is classified as "Class 1" in accordance with Article 1(1) of the European Commission Decision No. 2000/299/EC of 06/04/2000. Class 1 radio equipment may be placed on the market and used without restrictions in all Member States of the European Union.

CEPT Recommendation 70-03

The device uses a harmonized frequency band and, in order to comply with regulations, must be used with a maximum hourly duty cycle of 10%: in practice, no more than 10 minutes of transmission every 100 minutes.

WEEE disposal

At the end of its life cycle, the product must be disposed of separately from household waste. It is the user's responsibility to take the equipment to collection points dedicated to waste electrical and electronic equipment. Improper disposal will result in the application of administrative penalties provided for in EU Member States.

Bologna, 10/12/2025

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