

temaline

TK C12 (RTUK12)



Installation Manual ver.1.1

temaline
Creative solutions

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FCC NOTICE

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by tuning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: any modification or change not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Compliance Statement

This Class B Digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte les exigences du Règlement sur le matériel brouilleur du Canada.

FCC ID: HS9-RTU-K12

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received,
including interference that may cause undesired operation.

PRELIMINARY OPERATIONS

Mounting Instructions

The cables are attached to an encased box. **Make sure that you place the box at a height of 120cm from the floor** (see Figure 1).

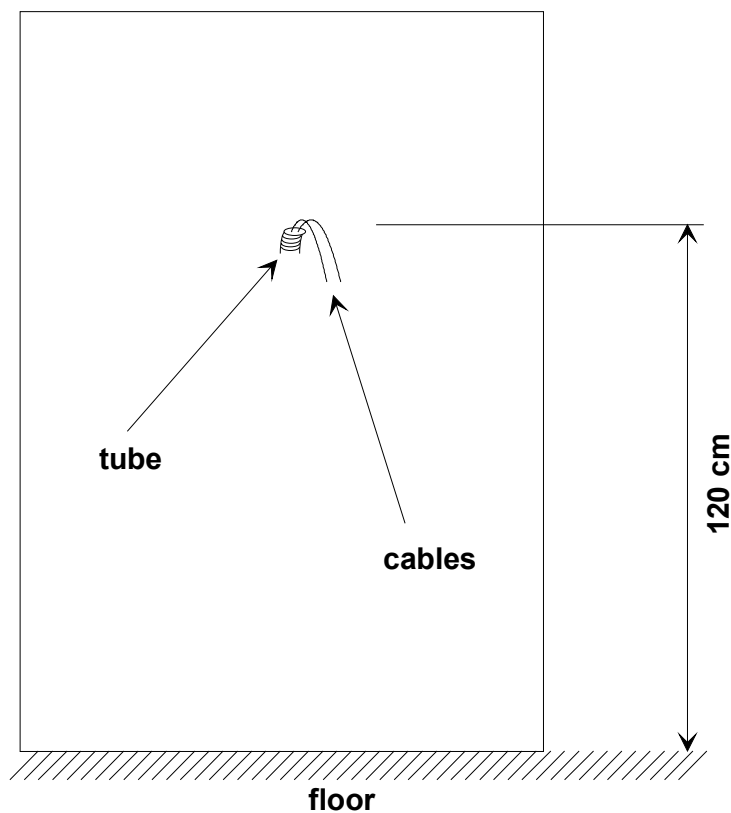


Figure 1. Space Requirements for Mounting

Attaching the Terminal Support Plate

To attach the terminal support plate, follow these steps:

1. Drill two holes into the wall to accommodate the plastic anchors that hold up the support plate (you must use M4 screws).
2. Make sure that the box attached to the wall is aligned with the niche on the lower part of the support plate
3. Use a $\varnothing$ 4mm slotted screwdriver.

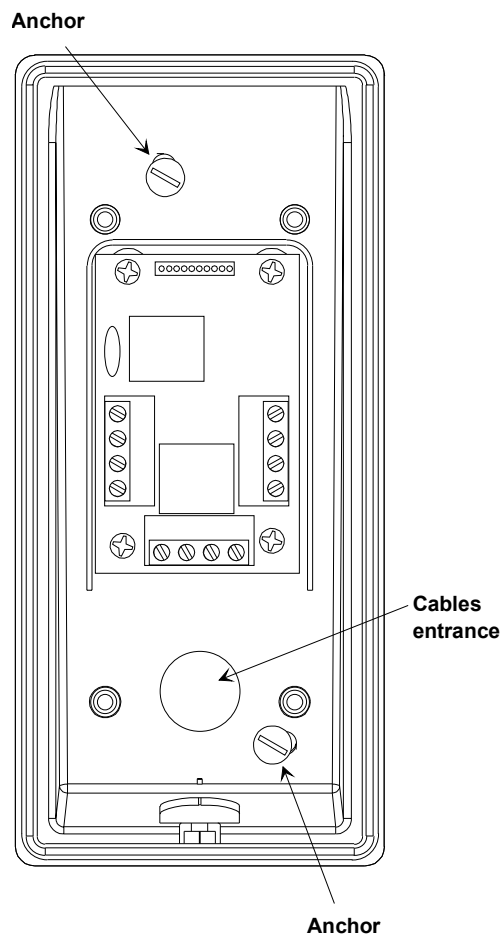


Figure 2. Attaching the Support Plate

Channeling the Cables from the Bottom of the Box

As an alternative, you can channel the cables so that they issue from the bottom of the box (see Figure 3). This alternative procedure consists of the following steps:

1. Drill a hole in the breakaway tab and apply a cable clamp with a clutch for the cable tube.
2. Remove the cable clamps from the rear side and apply the stopper.

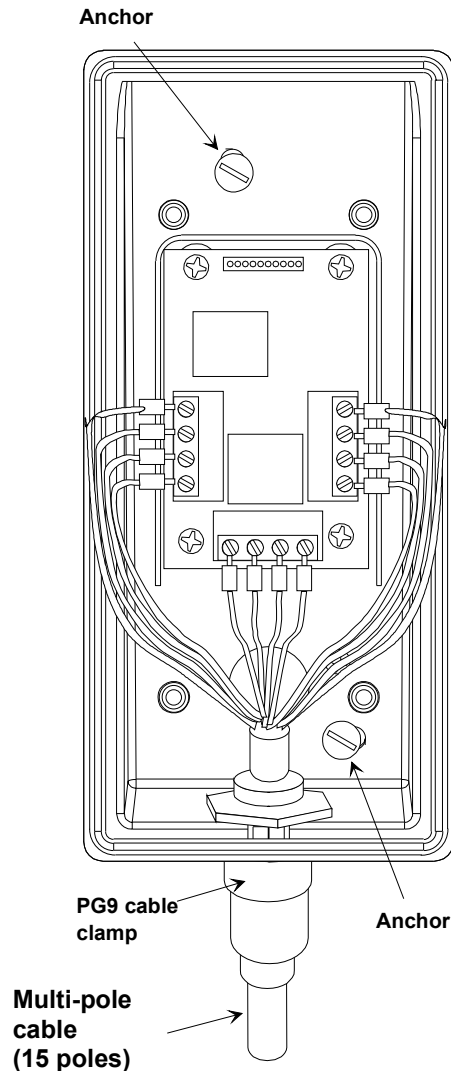


Figure 3. Channeling the Cables from the Bottom of the Box

INSTALLATION

Fixing and cable breakaway tab

Insert and fasten the power, data, and I/O cables in the connector (see Figure 4 and Figure 5). If there is also a small grounding cable, use a cable clamp to connect it to the screw supporting the card.

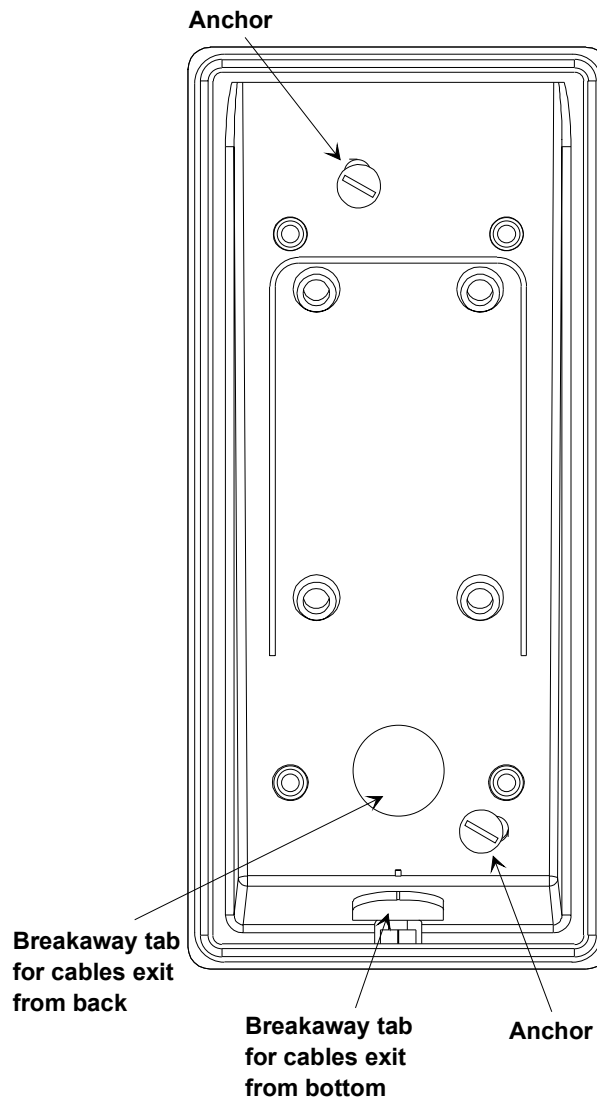


Figure 4. Fixing and Breakaway tab

Connectors and Jumpers

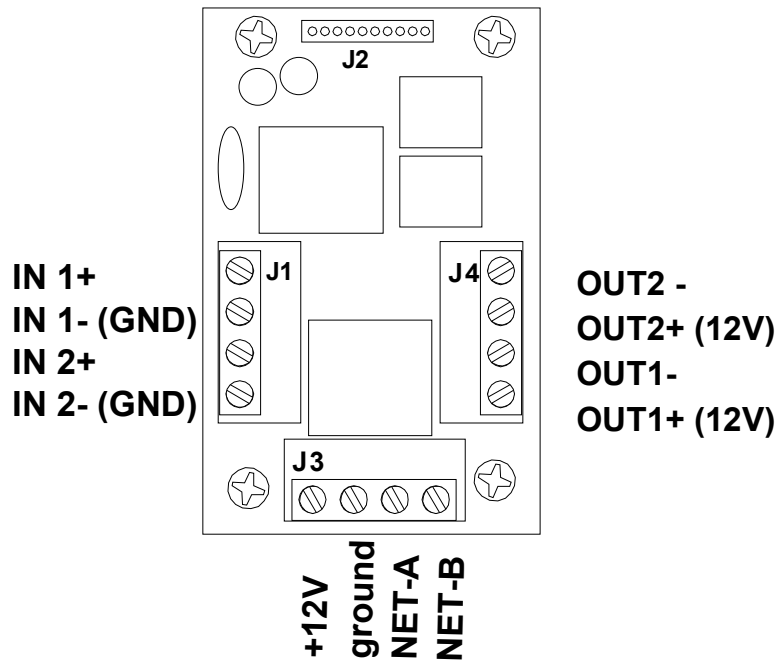
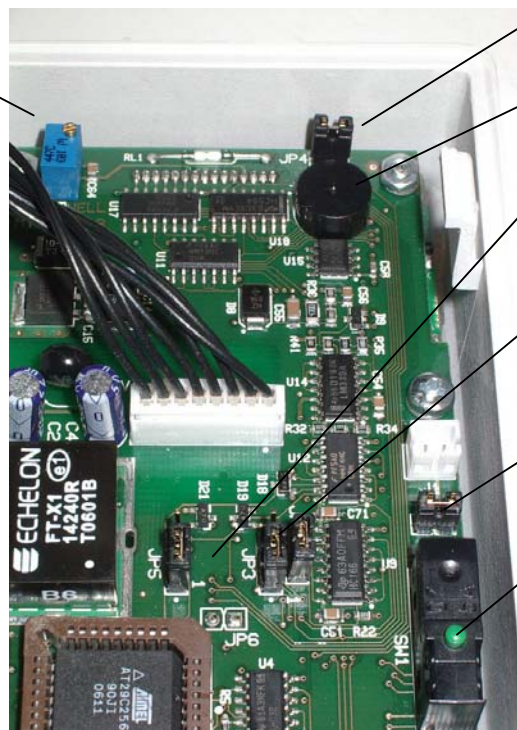


Figure 5. Connectors

LCD contrast
regulation Trimmer



JP4 → Buzzer
ON/OFF

BUZZER

JP3, 5 →
Outs NC/NO

JP2 → Inputs Mode

JP1 → Close (RFU)

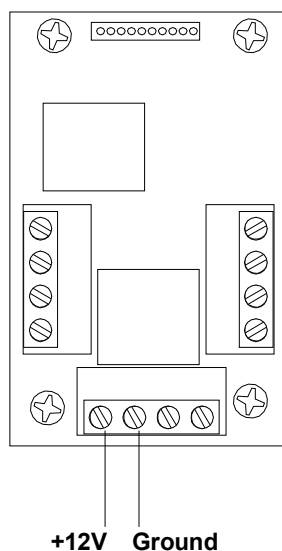
Tamper

Figure 6: Jumpers

Power

The RTU is powered at low voltage (12V_{DC} 150mA) by a battery-operated power supply module (RTU-Qxx). In order to determine the correct size for power cables, refer to the table below. Max voltage cable drop = 1,0VDC for assure that in battery power working, when battery min voltage is 10,5V the min RTU power supply → 9,5V (min RTU voltage).

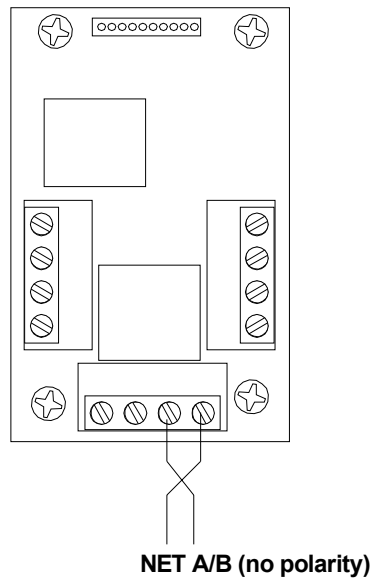
Type of cable			Length (m) in relation to effective load				
AWG	mm2	ohm/Km	150 [mA]	300 [mA]	600 [mA]	1,2 [A]	2,4 [A]
12	3,3	5,7	585	292	117	58	29
14	2	8,8	379	189	76	38	19
16	1,3	14	238	119	48	24	12
18	0,9	21	159	79	32	16	8
20	0,6	34	98	49	20	10	5
22	0,35	52	64	32	13	6	3
24	0,2	85	39	20	8	4	2



When the cables go out-of-doors is mandatory to use shielded cables. The cables' shielding must be connected to the ground connector.

For internal wiring without shielded cables is recommended an electrical environment where the cables are well separated, even at short runs, especially to the power cables or external cables which can be essentially subjected to interference or lighting.

NET



LONWORKS[®] Data Cables

- The LONWORKS[®]¹ data cable must be twisted-pair.
- In a free-topology configuration, the sum total of the sections must not exceed 500m.
- In a bus configuration, the sum total of the sections must not exceed 2700m.
- In a free-topology configuration, activate the 50ohm terminator by placing the appropriate jumper on the FTT10A plug-in of the CTU-PLG06 board inside the TemaServer.
- In a bus configuration, place two terminators (with resistance values of 100ohm 1% ½W) at the two ends of the bus.

¹ LONWORKS[®] is a trademark of Echelon Corporation

- Check that the length of the LONWORKS[®] data cable corresponds to the norms indicated in Table 1.

Type of cable			Length [m] in relation to cable capacity				
AWG	mm2	Ohm/Km	50nF/Km	100nF/Km	200nF/Km	500nF/Km	1uF/Km
12	3,3	5,7	2676	1892	1338	846	598
14	2	8,8	2153	1523	1077	681	482
16	1,3	14	1707	1207	854	540	382
18	0,9	21	1394	986	697	441	312
20	0,6	34	1096	775	548	346	245
22	0,35	52	886	626	443	280	198
24	0,2	85	693	490	346	219	155

Table 1. Length/Capacity of LONWORKS[®] Data Cables (m)

- The FTT10A Echelon[®] v1.2 User Guide recommends the cables indicated in Table 2.

Producer and Model	AWG	Connection to bus -maximum total length [m]	Connection in free topology –maximum node-node length max. [m]	Connection in free topology –maximum total wire length. [m]
Belden 85102	16	2700	500	500
Belden 8471	16	2700	400	500
Level IV (twisted-pair, typically solid and unshielded)	22	1400	400	500
JY (St) 2x2x0.8 (4-wire helical twist, solid shielded)	20	900	320	500
TIA Cat5	/	900	250	450

Table 2. Recommended LONWORKS[®] Cables

INPUTs

It is possible manage digital inputs or supervised inputs.

Usually the IN1 is dedicated to the Door contact

Usually the IN2 is dedicated to the push button (request to exit).

However the inputs can be also used as general purpose inputs

Mode select by JP2

- JP2 → Close → Supervised inputs (default)
Supervised inputs 4 status: normal, alarm, cut, short
- JP2 → Open → Digital inputs
Digital inputs status: open or Close

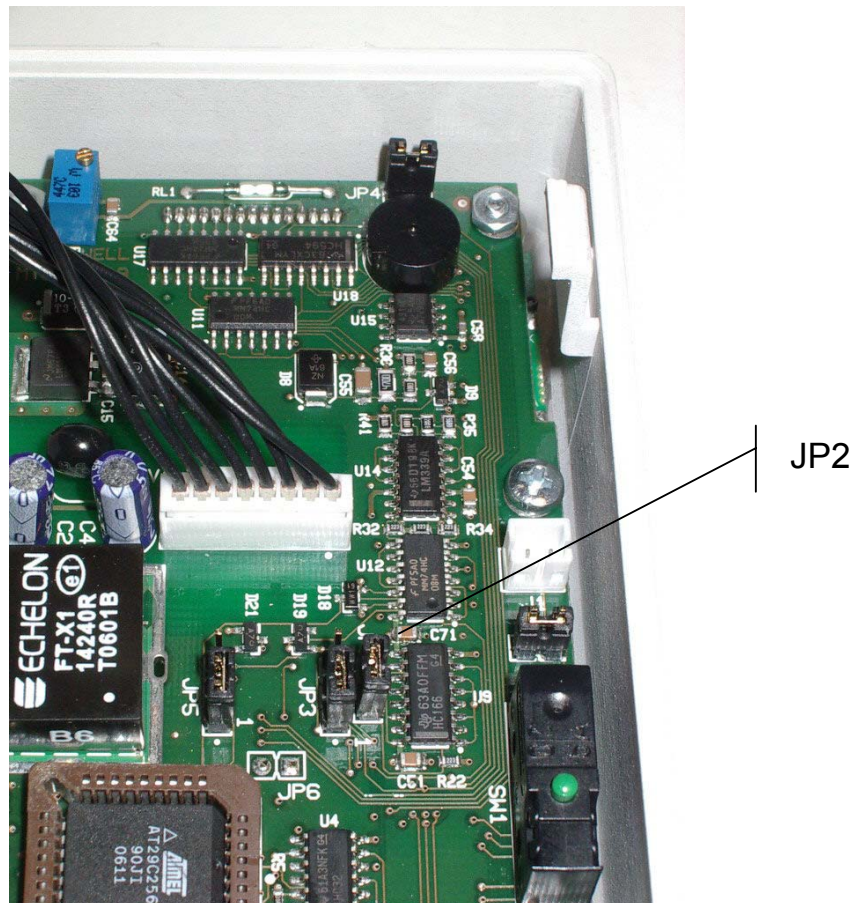


Figure 7: JP2 position

Digital INPUTs

The typical connection for digital dry contacts is shown in the next figure.

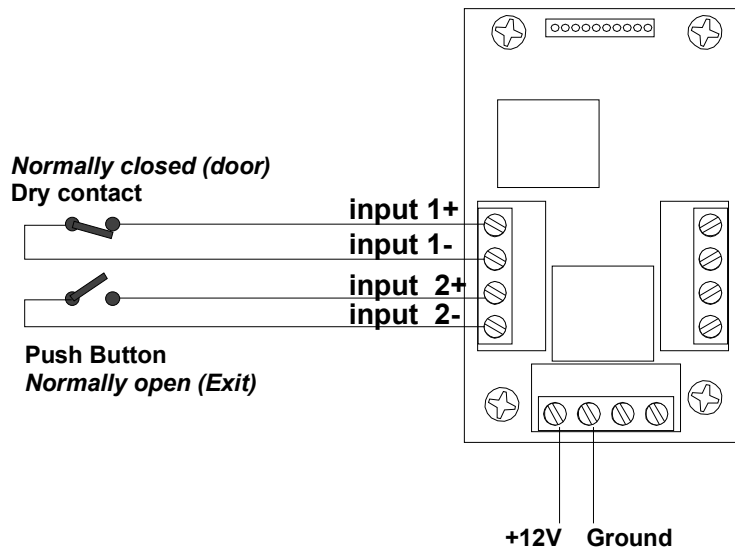


Figure 8. Clean Contacts Connection Example

When the cables go out-of-doors it is mandatory to use shielded cables. The cables' shielding must be connected to the ground connector.

For internal wiring without shielded cables is recommended an electrical environment where the cables are well separated, even at short runs, especially to the power cables or external cables which can be essentially subjected to interference or lighting.

Use a twisted-pair cable for the contact cables. Make sure that the cables correspond in size to the norms indicated in.

Max resistance = 25 Ohm

AWG	mm ²	ohm/Km	[m]
22	0,35	52	240
24	0,2	85	147

Table 3. Length of Contact Cables

Supervised INPUTs

The typical connection for supervised dry contacts is shown in the next figure.

Put the resistors close to the dry contact

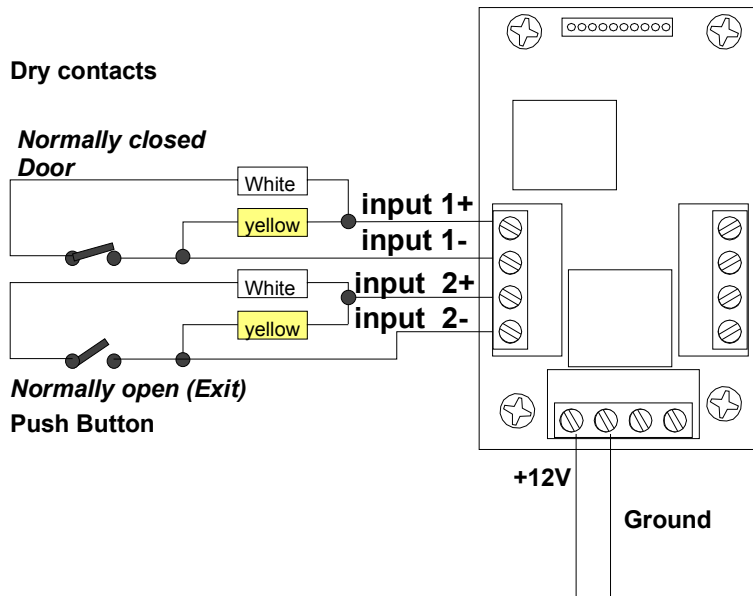


Figure 9. Supervised input connection

Yellow resistor: 1210 Ohm 1%

White resistor: 392 Ohm 1%

Close contact resistance: 296 Ohm

Open contact resistance: 1210 Ohm

When the cables go out-of-doors is mandatory to use shielded cables. The cables' shielding must be connected to the ground connector.

For internal wiring without shielded cables it is recommended an electrical environment where the cables are well separated, even at short runs, especially to the power cables or external cables which can be essentially subjected to interference or lighting.

Use a twisted-pair cable for the contact cables. Make sure that the cables correspond in size to the norms indicated in.

Max resistance = 25 Ohm

AWG	mm2	ohm/Km	[m]
22	0,35	52	240
24	0,2	85	147

Table 4. Length of Contact Cables

Power OUTs

It is possible manage 2 digital outputs NC (Normally Close) or NO (Normally Open)

Usually the OUT1 is dedicated to the Door Electrolock

Usually the OUT2 is dedicated to the Busy lamp.

However the Outputs can be also used as general purpose outputs

Mode NC/NO select by JP 3 and JP4

JP3 → 1-2 OUT 1 NO (default)
2-3 OUT 1 NC

JP5 → 1-2 OUT 2 NO (default)
2-3 OUT 2 NC

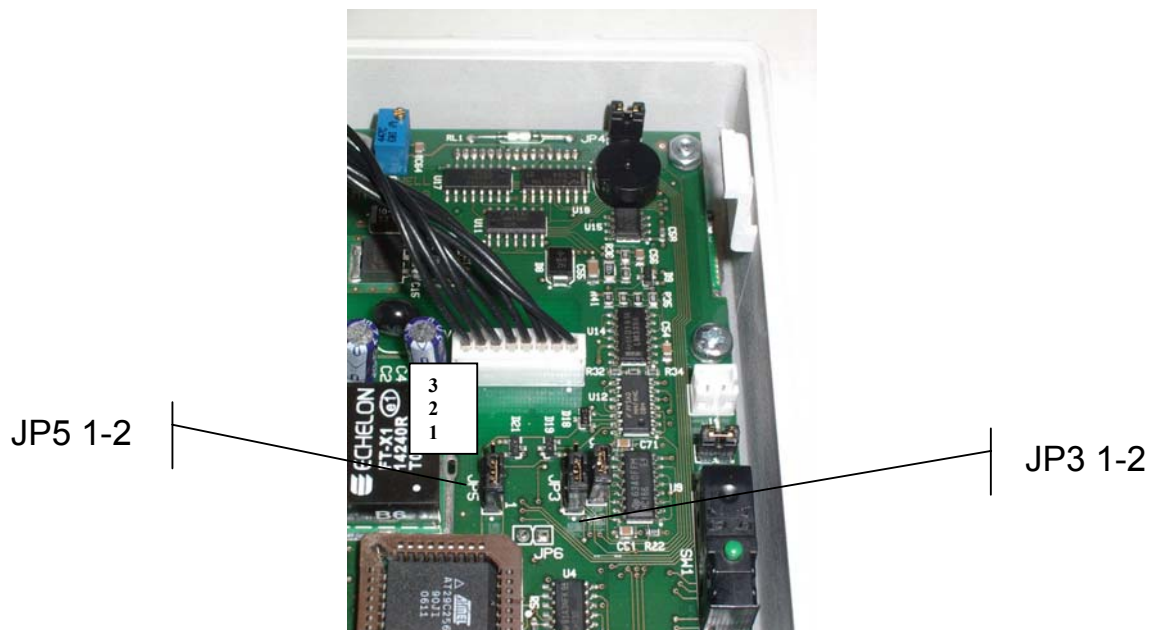


Figure 10: JP3 and JP5 position

Internally, the output lines are provided with Power Mosfet that can drive to ground:

1,2A 30V continuous

5A 30V (0,5 sec) peak current for inductive loads

When the cables go out-of-doors is mandatory to use shielded cables. The cables' shielding must be connected to the respective ground connectors (GND).

For internal wiring without shielded cables is recommended an electrical environment where the cables are well separated, even at short runs, especially to the power cables or external cables which can be essentially subjected to interference or lighting.

Resistive load

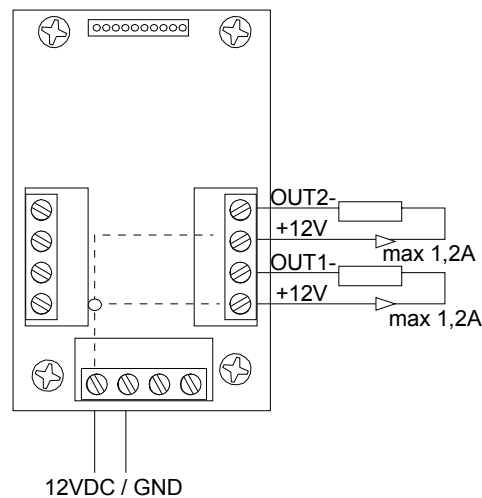


Figure 11: Connecting to resistive loads

Inductive load

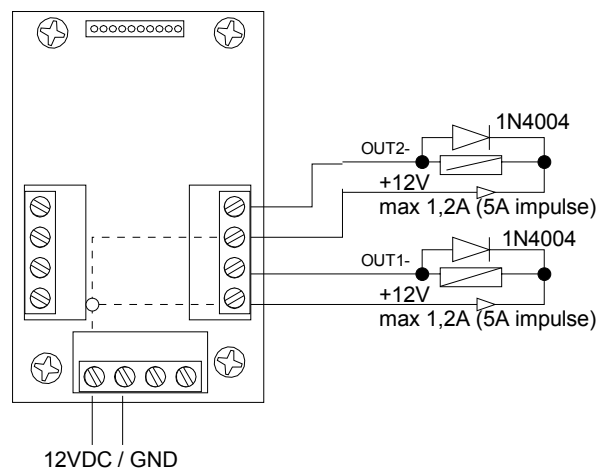


Figure 12: Connecting to inductive loads

Inductive load with external Power supply

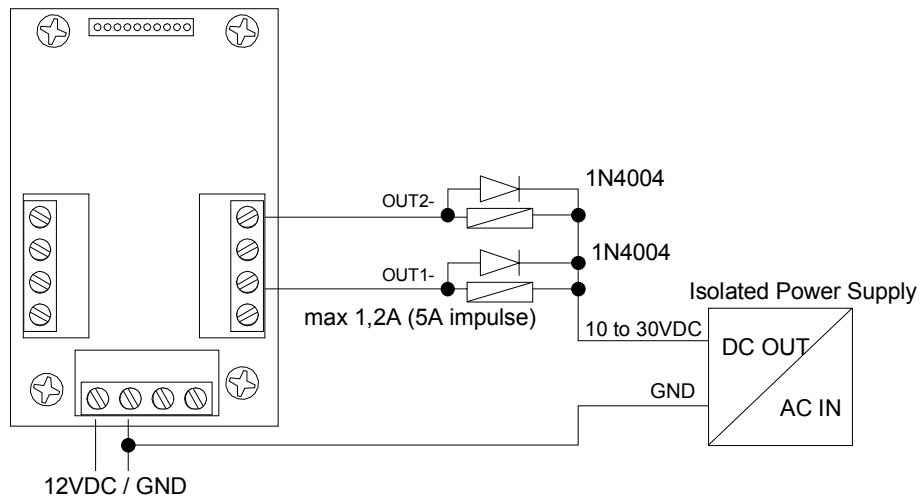


Figure 13: Connecting to inductive loads with an external isolated power supply

Note for inductive loads

- In this case is mandatory use the 1N4004 diodes as in figure. Two (2) Diodes are included in the product
- The external power supply has to be isolated

External relays

When the load exceeds the max internal Mosfet current it is possible to use external relays

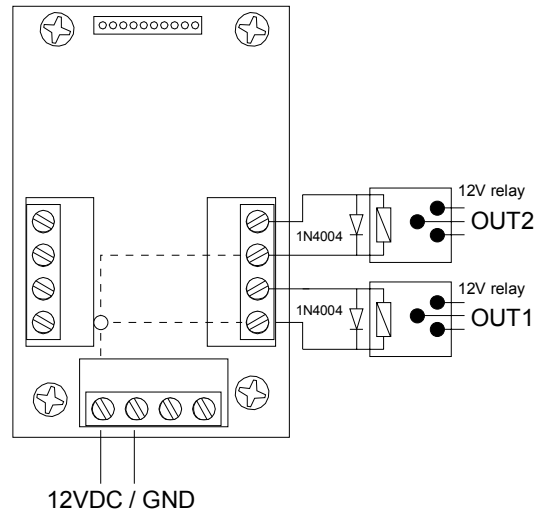


Figure 14. Relays OUT

Notes:

- Use 12VDC relay - max coil current = 100mA each.

In this case is mandatory use the 1N4004 diodes as in figure.

Assembling the Terminal Closure Guide

To assemble the terminal closure guide, follow these steps:

1. Use the 4 special screws to assemble and fasten the terminal closure guide.
2. Insert the nut and the special screw into the corresponding niche on the guide (see Figure 15).

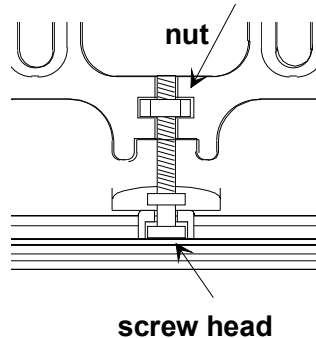


Figure 15. Mounting the Terminal Closure Guide (1)

Make sure that the fitting is correctly positioned, and then insert the flat cable from the front casing into the connector (see Figure 16).

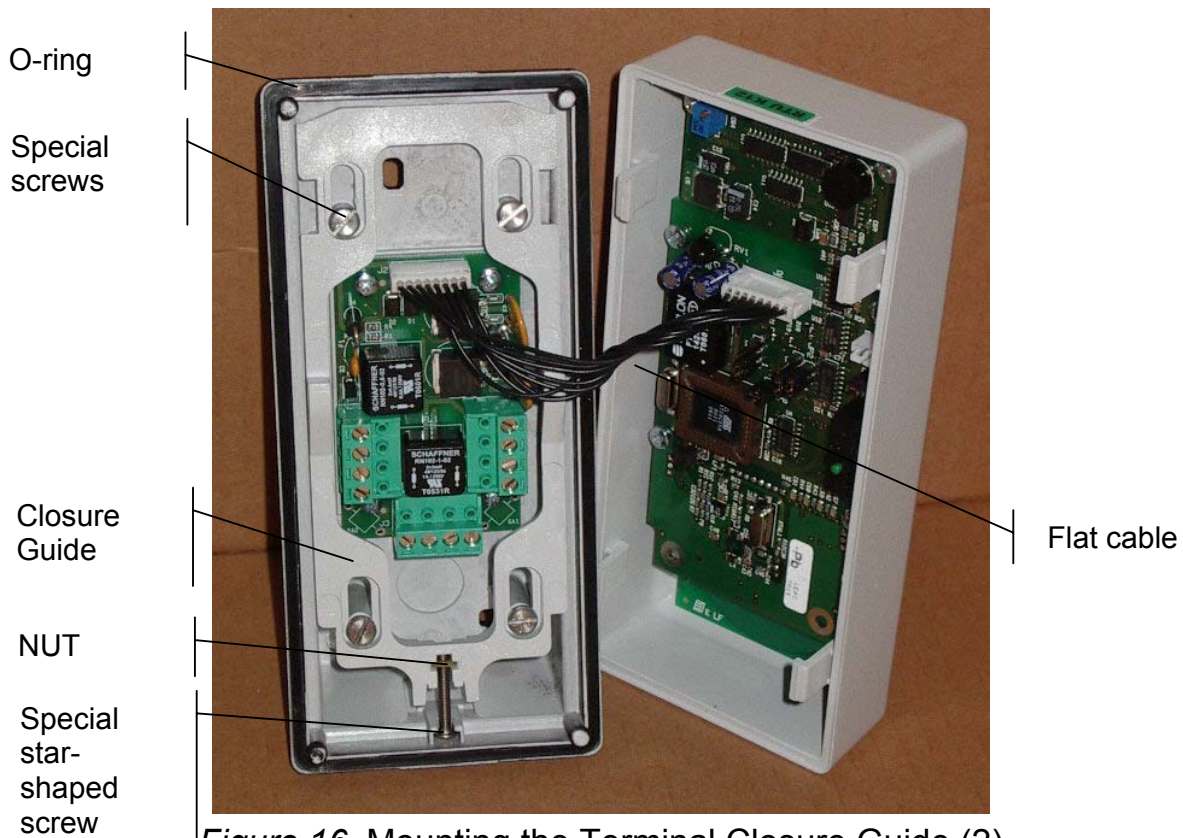


Figure 16. Mounting the Terminal Closure Guide (2)

Closing the Terminal (Wall-Mounted Assembly)

To close a wall-mounted terminal, follow these steps:

1. Unscrew the special closure screw by turning it counterclockwise so that the terminal closure remains fully open (in the direction of the wedge).
2. Insert the upper shell as indicated in Figure 17.
3. Fasten the special closure screw by turning it clockwise and pushing down on the shell, so that the fitting is completely secure.
4. Tighten the screw.

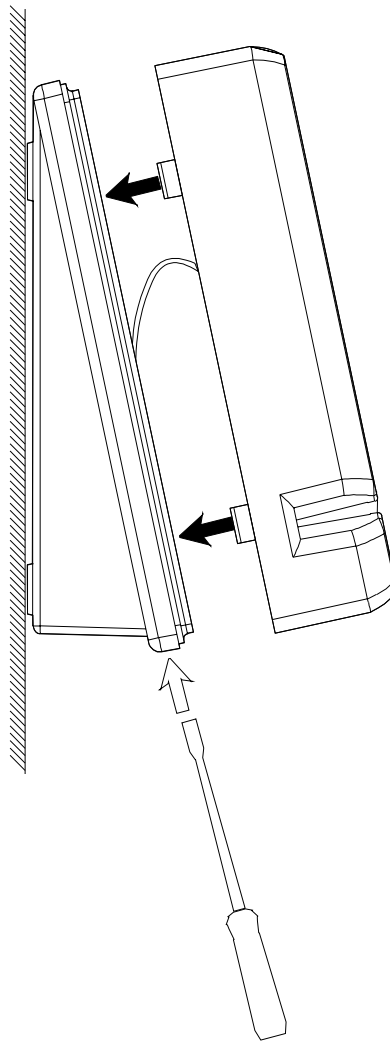


Figure 17. Closing the Terminal (Wall-Mounted Assembly)

Closing the Terminal (Turnstile-Mounted Assembly)

To close a turnstile-mounted terminal, follow these steps:

1. Unscrew the special closure screw by turning it counterclockwise so that the terminal closure remains fully open (in the direction of the wedge).
2. Insert the upper shell as indicated in Figure 18.
3. Fasten the special closure screw by turning it clockwise and pushing down on the shell, so that the fitting is completely secure.
4. Tighten the screw.

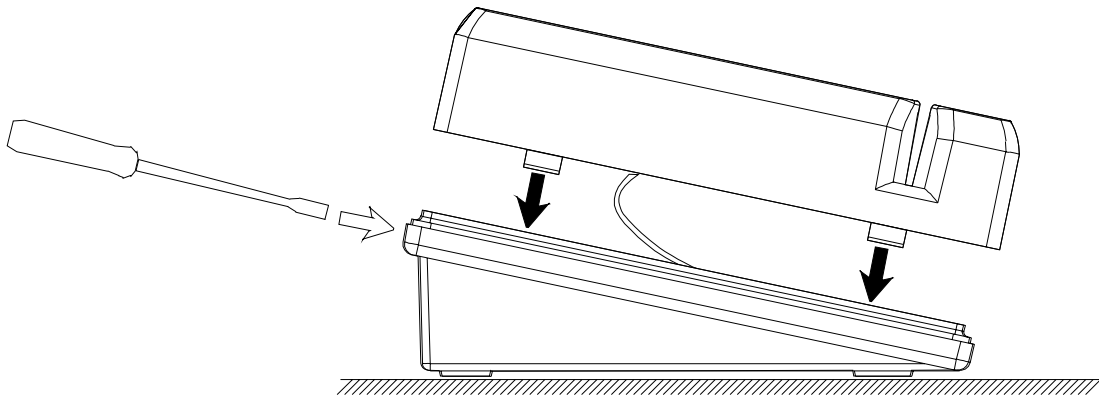


Figure 18. Closing the Terminal (Turnstile-Mounted Assembly)

ACTIVATION

Identification via the Service Pin

To identify the node, you can activate the service pin by means of a relay reed located inside the unit (see the below figure). This procedure consists of the following steps:

1. Position a small magnet as illustrated to activate the service pin. This signal is linked to the yellow central service LED, which flashes throughout the node configuration procedure.
2. The TemaServer, in response to the service pin, sends a *wink* command that makes yellow LED flash three times. This allows you to verify that communication to and from the TemaServer is working.
3. Check that the service LED remains off after you have completed this operation.

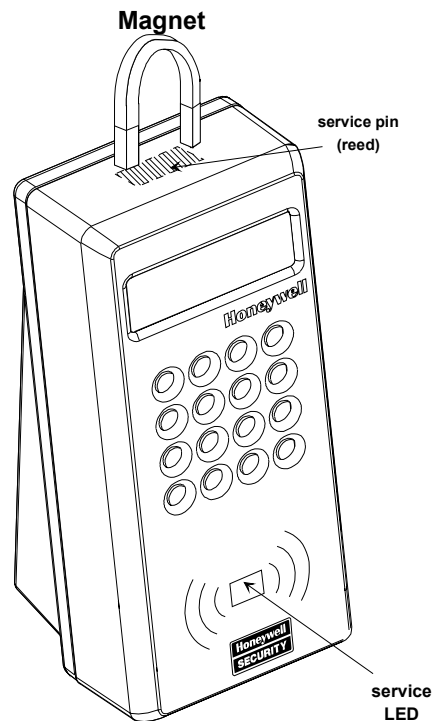


Figure 19. Using a Magnet to Activate the Service Pin

Identification via Bar Code

The components enclosed in the packaging include a bar code label. The person responsible for installing the terminal must apply this label to the corresponding identification form, and indicate the location of the terminal in the appropriate box (see example in Table 5).

Description of location Office entrance area, first floor - staircase E	
Description of TemaServer Panel 2 entrance area, first floor - staircase E	
TKC01 (RTU-K01) 	NID label
TKC02 (RTU-K02) 	
TKC03 (RTU-K03) 	
TKC12 (RTU-K12) 	

Table 5. Example of Completed Identification Form

TECHNICAL SPECIFICATIONS

TemaKey TK C12 (RTU-K12 code 1500164xx)

Parameter	Value
DC power supply	12V _{DC} ±20% 150mA (2W)
Weight	0.4 kg
Size	72x160x75 mm
Protection level	IP55
Operational temperature	-20 ÷ 60 °C
Storage temperature	-20 ÷ 70 °C
Storage relative humidity	0 ÷ 90 % without condensation
Display	Alphanumeric 16x2 – led backlight
Acoustic signal	1 Buzzer
LED	1 led with 3 color: - RED - Green - Yellow (Lon service Led)
Keyboard	4 x 4 keypad with soft epoxy / UL treatment on keys for harsh environment
Proxy receiver	13,56MHz for 14443A / B cards Reading range: depending on technology of card. Typical 7 cm for MIFARE ² full ISO14443A Typical 4 cm for STM ISO14443B

² MIFARE® is a registered trademark of Philips Electronics N.V.

Inputs	2 supervised or digital inputs. Mode select by JP2 JP2 = Close → Supervised inputs JP2 = Open → Digital inputs - Supervised inputs with 4 status: normal, alarm, cut, short - Digital inputs with status: open or Close Current 0 to 10mA for each input (internal reference 5Vdc) Voltage +14V max. 0V min
Outputs	Number 2 Type Power Open drain (MOSFET) Current 1,2A continuous 5A (0,5sec) impulsive Voltage 10V...+14V (internal Power supply) Voltage (absolute max) 10V...+30V (from external Power supply). Current 1,2A [5A / 0,5sec peak max – inductive load] Normality NO or NC via Jumper setting JP3 = 1-2 OUT 1 NO 2-3 OUT 1 NC JP5 = 1-2 OUT 2 NO 2-3 OUT 2 NC Wire length connection: it depends on cable diameter, load current sink and load min power supply On state resistance = typical 20 mOhm Load 1A = 0.02 V

Other Jumpers	JP4 → normally close Close = Buzzer enabled Open = Buzzer disabled JP1 → normally close (reserved for future use) JP6 → normally open (reserved for future use)
LONWORKS^{®3} connection	Unshielded twisted-pair cable in free topology (transceiver FTT10A, 78Kbps)
Compliance with Regulations	 Directive EMC 89/336/EEC, 92/31/EEC, Directive Low Voltage 72/23/EEC, 93/68/EEC: EN60950, EN55024, EN55022, EN 300 330
Environment friendly 	RoHS / WEEE compliant device Directives 2002/95/EC 2002/96/EC

Optional Parts

TORX screwdriver	TX10 code 1500108AA
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³ LONWORKS[®] is a trademark of Echelon Corporation

Recycling

In application of directive 2002/96/EC regarding waste electrical and electronic apparatus, effective beginning 13 August 2005, Honeywell commits, when requested by the customer, to the collection, treatment, recovery, and disposal of the apparatus produced.

Customers in European Union are advised to dispose this product, at the end of its useful life, as per applicable local laws, regulations and procedures

