temaline

TKL12 (RTUL12)

Installation Manual

temaline
Creative solutions

CONTENTS

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, these 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 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 expressely 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 numerique de la classe B respecte les exigences du Reglement sur le material broilleur du Canada.

PREPARATIONS

1.1 Wall Set Up for the Cable Trays

The cables must:

1) Protrude from the wall.
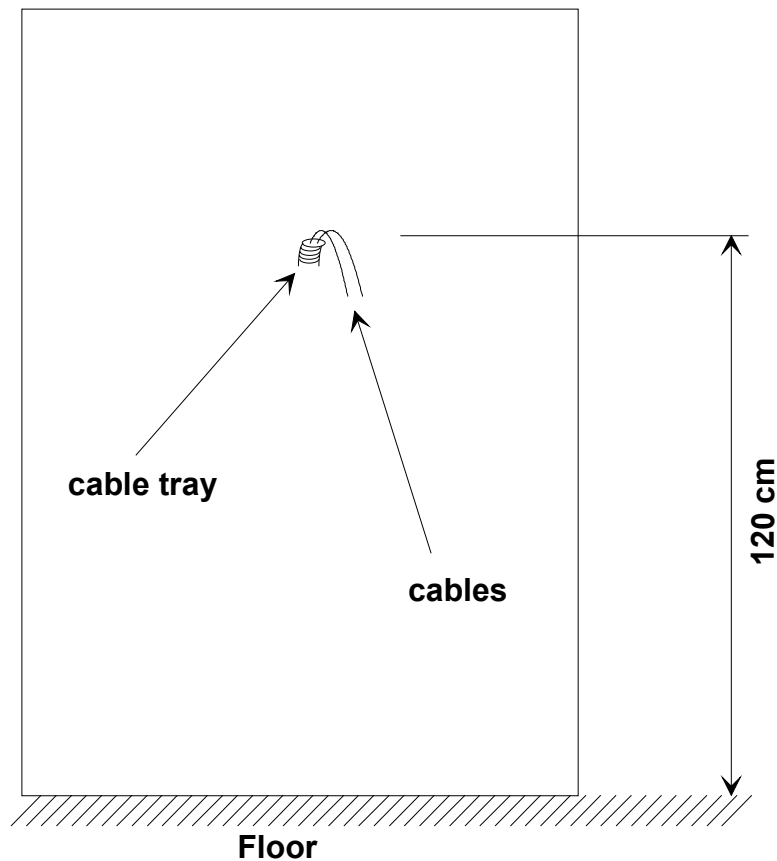
2) Come out at 120cm from ground (see Figure 1) (advised).

Figure 1: Wall Set Up for the Cable Trays

1.2 Electrical Connections

The RTU is powered at low voltage (12VDC 160mA), preferably using a power supply module with battery backup (RTU-Qxx), or using an ordinary power supply having the same characteristics. The power cables must be dimensioned as indicated in the table below. The maximum allowable voltage drop on the power cable is 1V.

- Cable length(m) = 1V / (I[A] load x 2 x (res [Ohm/km] /1000))

Cable Type			Extension [m] based on load		
AWG	mm2	ohm/Km	160 [mA]	320 [mA]	
12	3.3	5.7	548	274	
14	2	8.8	355	178	
16	1.3	14	223	112	
18	0.9	21	149	74	
20	0.6	34	92	46	
22	0.35	52	60	30	
24	0.2	85	37	18	

The device is equipped with 2 non-removable cables of 3m length:
- Two-pole, twisted, unpolarized cable dedicated to the LON line connection
- LON a $\qquad$ 0,325 mm^2 white
- LON b $\qquad$ 0,325 mm^2 orange
- Six-pole cable, providing the following signals:
- +12VDC $\qquad$ 0,2 mm^2 red
- GND $\qquad$ 0,2 mm^2 black
- INPUT 1 + $\qquad$ 0,2 mm^2 brown
- INPUT 2 + $\qquad$ 0,2 mm^2 orange
- OUT OC1 $\qquad$ 0,2 mm^2 yellow
- OUT OC2 $\qquad$ 0,2 mm^2 green

The signals must be connected using a shunt box with IP protection level in conformance with the type of environment in which it is to be used:
- IP55 for moist environments
- Recessed box or IP31 at least for inside installations

The shunt box must be positioned within the perimeter controlled by the access control system.
The repeater relays must be inserted inside the box for electrical locking commands and the signal light.
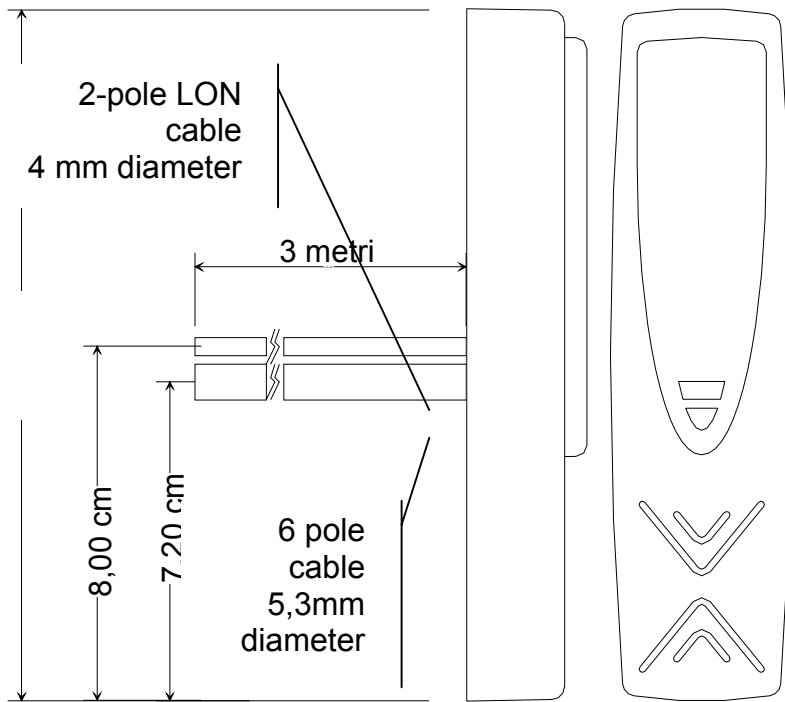
2-pole LON
cable
4 mm diameter

3 metri

8,00 cm

7,20 cm

6 pole
cable
5,3mm
diameter

Figure 2: Position and dimensions of the non-removable cables

Shunt Box

3 meters

RTUL12

Cable +12VDC

Cable LON
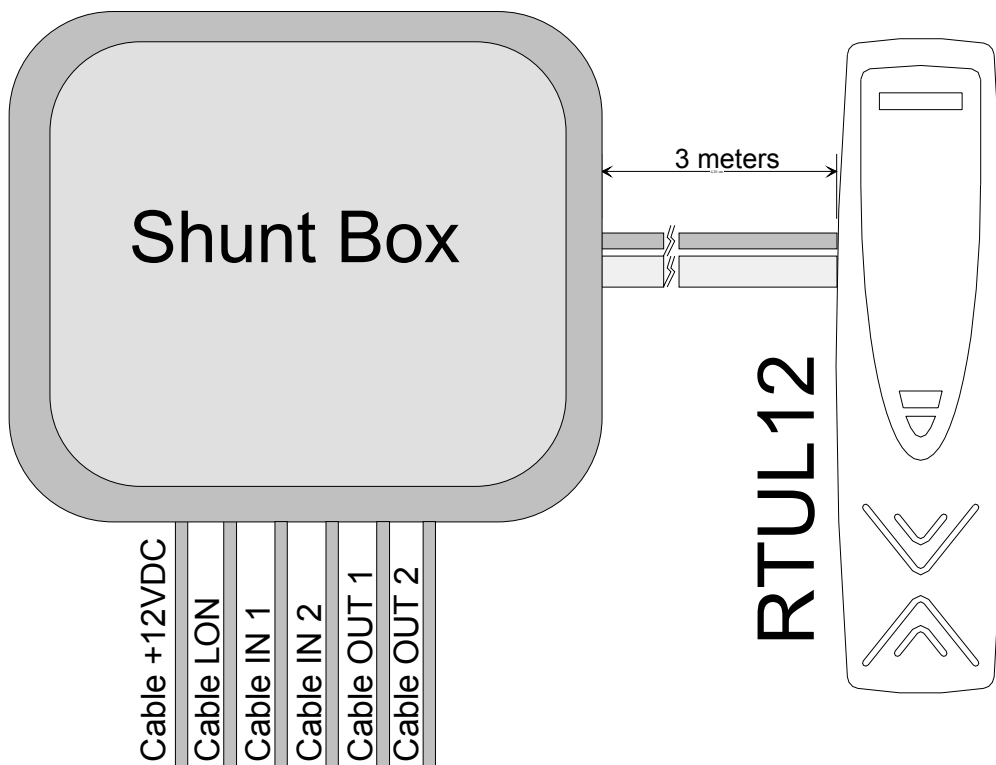
Cable IN 1

Cable IN 2

Cable OUT 1

Cable OUT 2

Figure 3: Shunt Box

1.3 LONWORKS® Data Cables

- The LONWORKS[1] data cables must be double twisted-pair cables

- In a free topology configuration, the overall length of the sections must not exceed 500m

- In a bus configuration, the overall length of the sections must not exceed 2700m

- In the free topology configuration, the 50ohm terminator must be enabled by inserting the appropriate jumper into the FTT10A plug-in on the CTU-PLG06 board inside the TemaServer

- In a bus configuration, two terminators must be inserted at the two ends of the bus (resistance of 100ohm 1% ½W)

- The LONWORKS[1] data cables must be dimensioned according to the indications in Table 1

Cable Type			Extension [m] based on cable capacitance				
AWG	mm^2	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/Capacitance of LONWORKS®[1] Cables

- The FTT10A Echelon® v1.2 User's Guide suggests using the cables as indicated in Table 2.

Make and Model	AWG	Bus Connection Max Length total [m]	Free Topology Connection Node-to-Node Max Length [m]	Free Topology - Connection Max Length total [m]
Belden 85102	16	2700	500	500
Belden 8471	16	2700	400	500
Level IV (twisted pair, solid, unshielded)	22	1400	400	500
JY (St) 2x2x0,8 (4 solid wires, spiral-twisted, shielded)	20	900	320	500
TIA Cat5	/	900	250	450

Table 2: Suggested LONWORKS® Cables

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[1] LONWORKS® is a trademark of the Echelon Corporation

1.4 Mounting the Wall Bracket

Mount the bracket onto the wall as follows:

1. Placing the bracket against the wall and mark the proper positions of the three holes, make the holes for the three bolts that will go into the wall to hold the bracket and the bolt for the tamper switch (the bolts are included in the installation kit)

2. Make sure that the cable tray matches with the hole for the passage of the cables
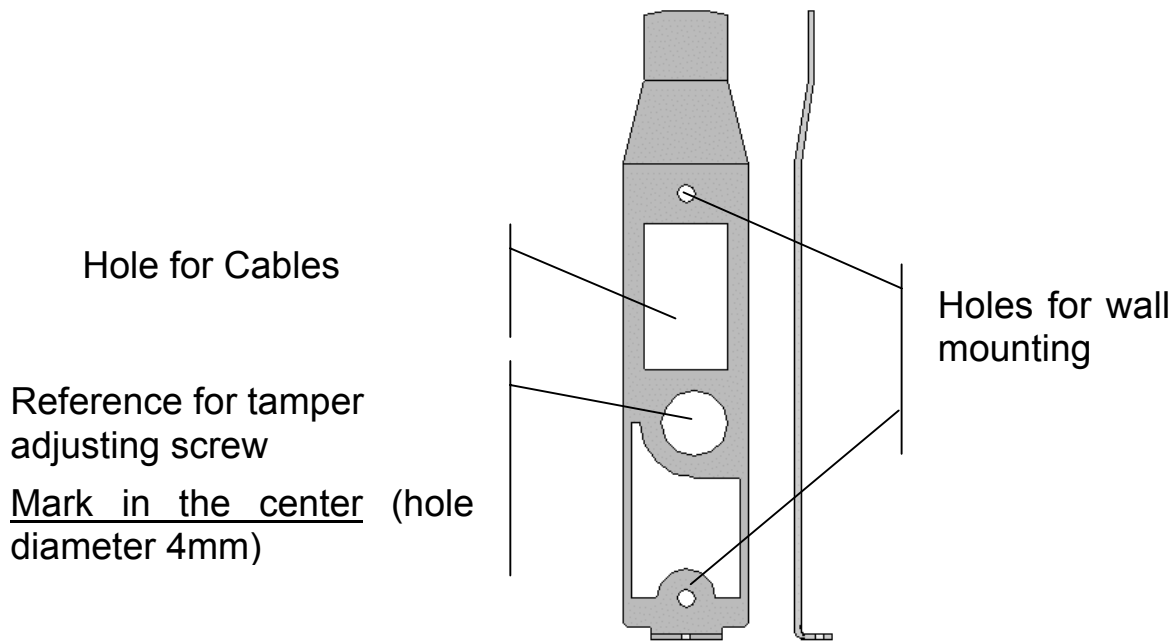
3. Fix the plate and adjust the tamper screw.

Hole for Cables

Reference for tamper adjusting screw

Mark in the center (hole diameter 4mm)

Holes for wall mounting

Figure 4: Wall Bracket: Front and Side View

Adjust the screw so that is in line with the bracket surface

Figura 5: Tamper adjusting screw

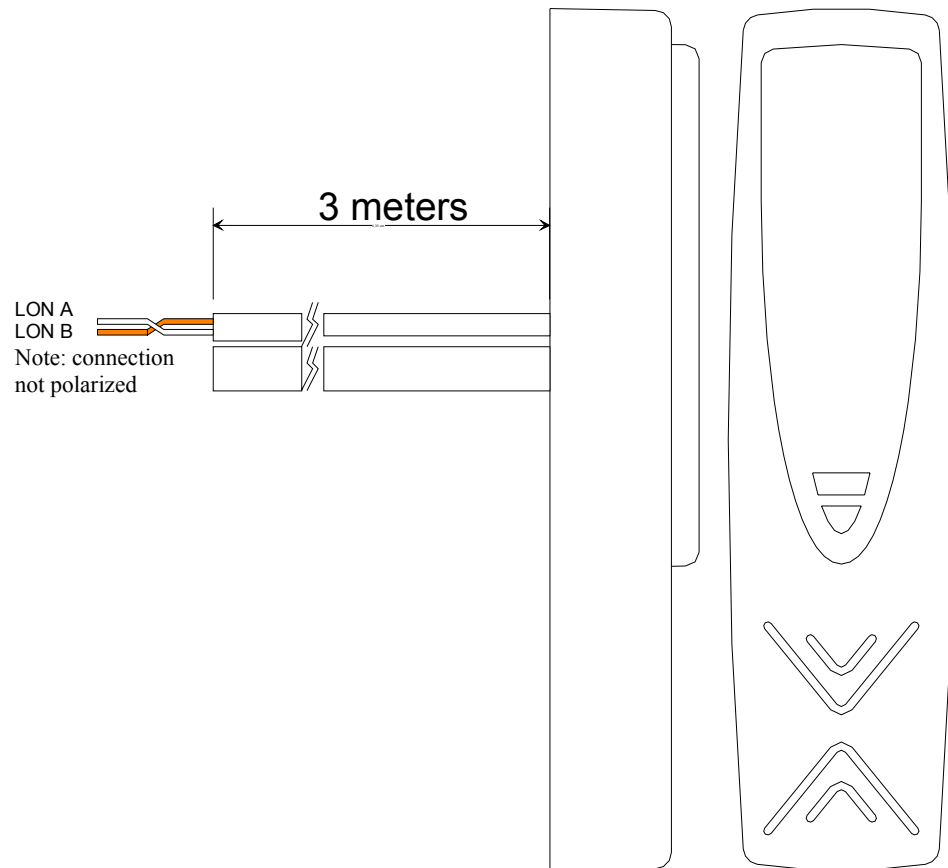# 1.5 LON, power and door wiring

1.5.1 LON Cable

LON A
LON B
Note: connection
not polarized

3 meters

Figure 6: LON (1) Cable Connection

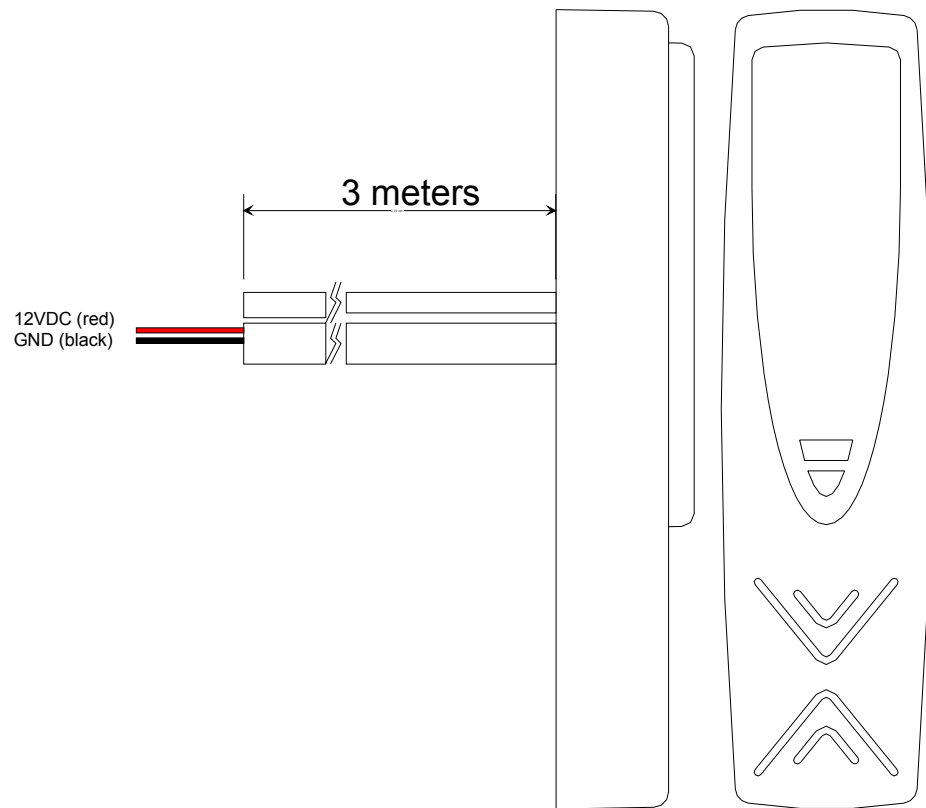## 1.5.2 Power Supply Cable +12VDC

3 meters

12VDC (red)
GND (black)

Figure 7: Power Supply Connection

1.5.3 Input Cable 1 – Door Contact

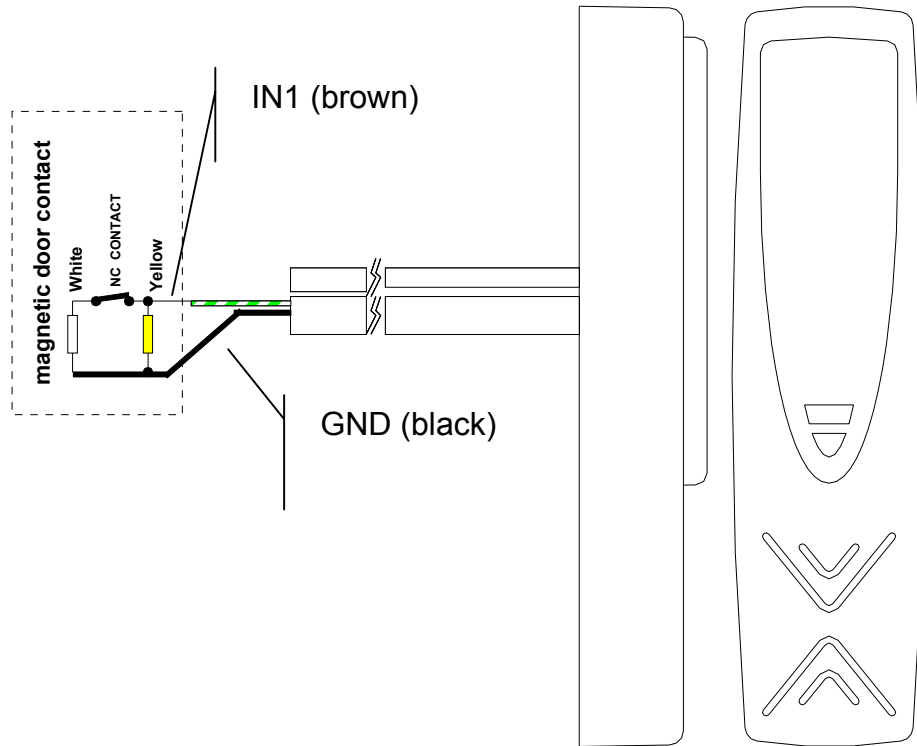Supervised input1 is for the door status control; resistors must be installed at the door contacts.

Figure 8: Supervised Input 1 connection – Door Contact

Yellow resistor: 1210 Ohm 1%

White resistor: 392 Ohm 1%

Close contact resistance: 296 Ohm

Open contact resistance: 1210 Ohm

Max wires resistance: 25 Ohm

1.5.4 Input Cable 2 – Push Button

Supervised input 2 is for the push button status; resistors must be installed at the door push button contacts.
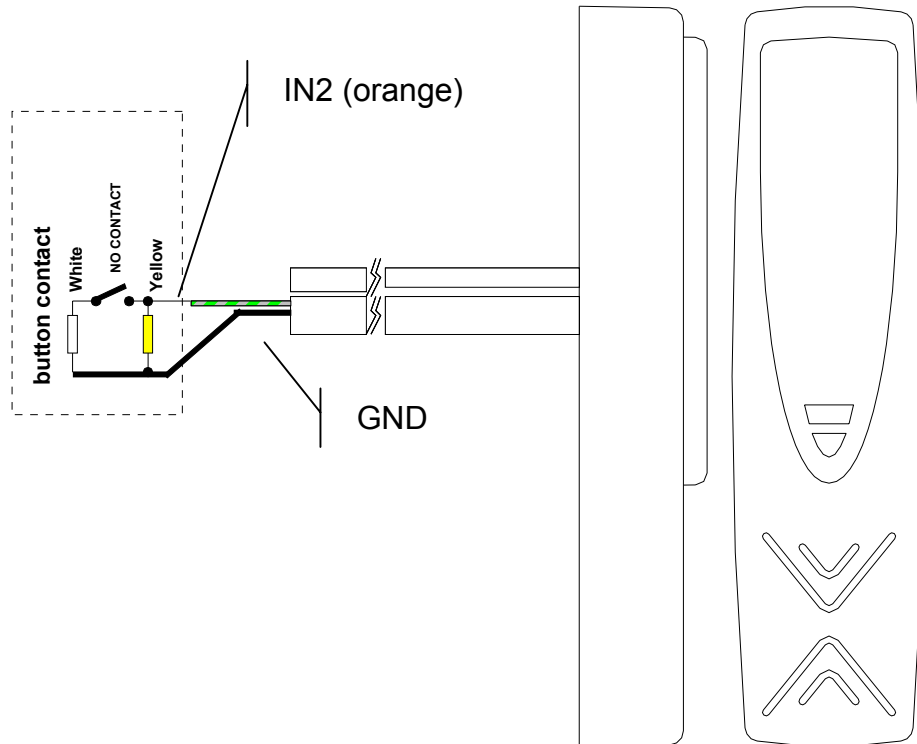

Figure 9: Supervised Input 2 connection– Push button

Yellow resistor: 1210 Ohm 1%

White resistor: 392 Ohm 1%

Push button close resistance: 296 Ohm

Push button open resistance: 1210 Ohm (normality)

Max wires resistance: 25 Ohm

Note: in case the push button is unused the INPUT has to be terminated with the Yellow resistor.

1.5.5 Output 1 – Door lock

The open collector output 1 (I max = 100mA) is used for door lock.

An external DC relay must be installed in accordance with the following limits:

- Max relay voltage = 28VDC

- Max relay current = 100mA

- Max Vce(sat at 100mA) = 1.2V

It is <u>mandatory</u> to use the 1N4004 (or equivalent) provided diode in parallel to the coil of the relay.
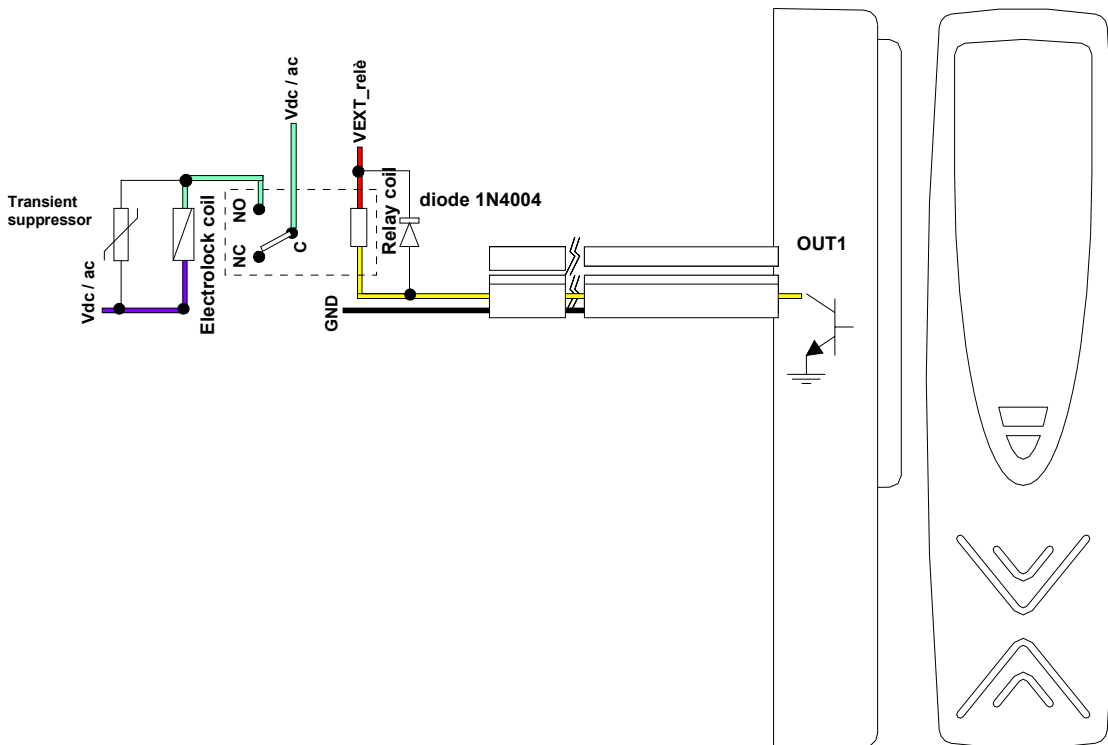
Inductive load with alternating current: not allowed

Figure 10: Output 1connection – Door Lock

1.5.6 Output 2 – Door status light

The open collector output 2 (I max = 100mA) is used for signaling the status of the door (gateway occupied / free).

An external DC relay must be installed in accordance with the following limits:

- Max relay voltage = 28VDC

- Max relay current = 100mA

- Max Vce(sat at 100mA) = 1.2V

It is mandatory to use the 1N4004 (or equivalent) provided diode in parallel to the coil of the relay.

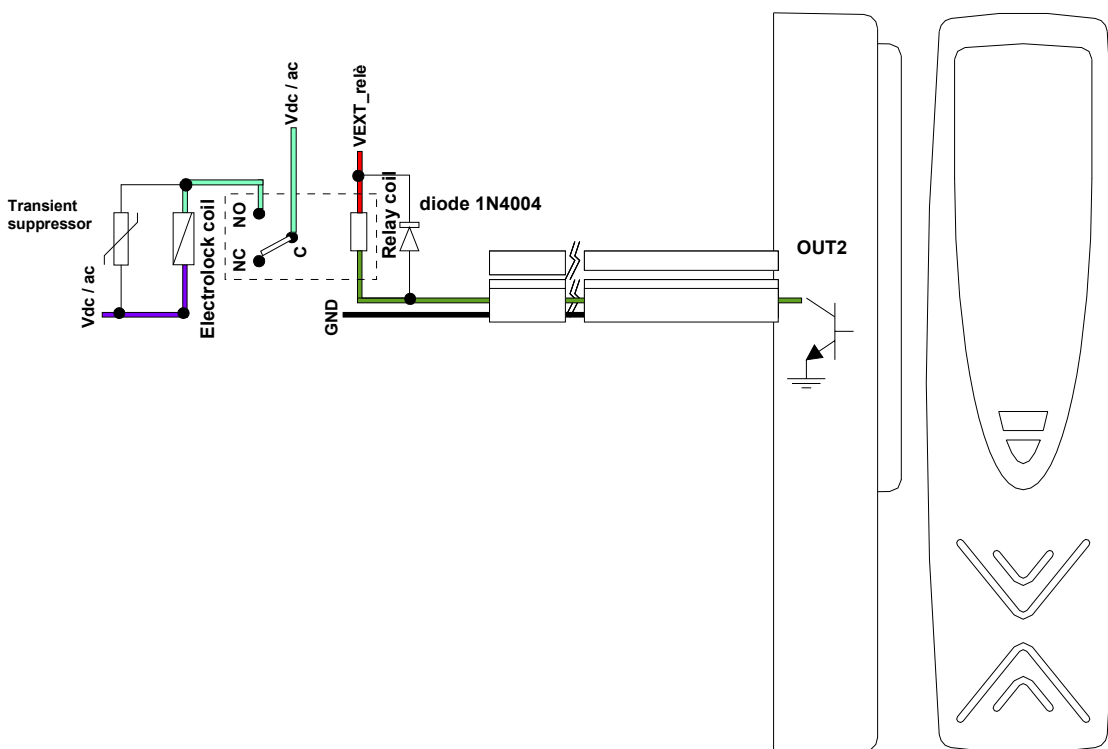Inductive load with alternating current: not allowed

Figure 11: Output 2 connection- door status light
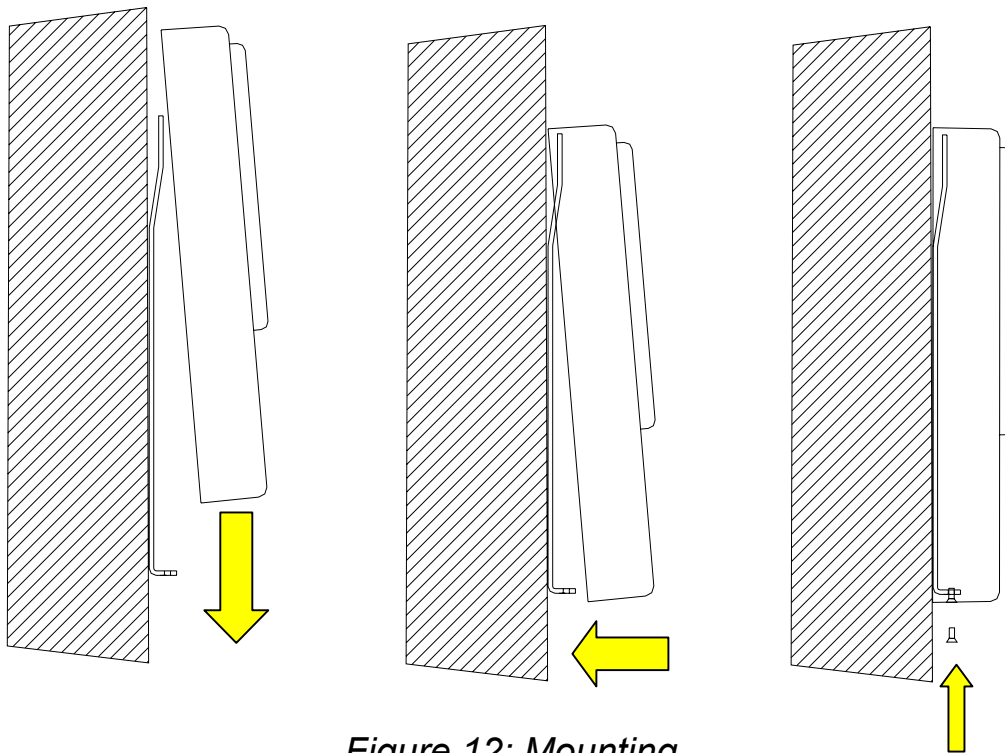
1.6 Mounting the Device on the Wall Bracket

Figure 12: Mounting

1) *The RTUL12 is positioned atop the wall bracket protrusion*

2) *The back part is aligned with the wall by rotating*

3) *The RTUL12 is mounted onto the bracket using screws*

1.7 Identification Using the Service Pin

To identify the node, you can call the service pin using the relay-reed found inside the device (see Figure 13). Use the following steps for this procedure:

1. Place a small magnet as indicated in Figure 13 to call the service pin. The signal is linked to the yellow service LED (at the center), which will blink throughout the operation.

2. The TemaServer will send a *wink* command in response to the service pin, which lights the yellow LED and the buzzer three times. This allows you to verify that communications are operational to and from the TemaServer.

3. Check to see that the service LED is off at the end of the operation.
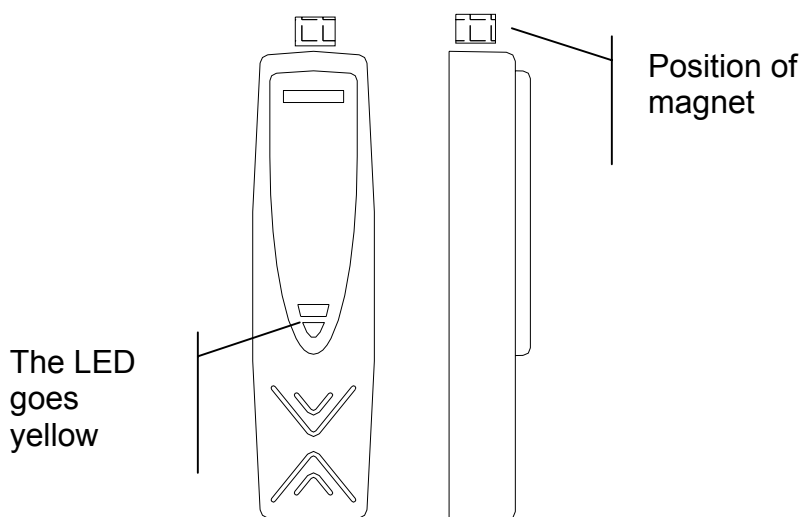
Position of
magnet

The LED
goes
yellow

Figure 13: Calling the Service Pin Using a Magnet

1.8 Identification Using the Neuron ID

The label with the neuron ID that comes with the kit must be applied by the installer on the appropriate identification sheet. You also must indicate the location of the terminal in the appropriate box (see example in Table 3).

Description of Location	
Entrance to Offices, First Floor, Stairway E	
Description of TemaServer	
Panel2, Entrance, First Floor, Stairway E	
RTUL19 ☐	PROG.ID= 4896873498696586 ‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖ 255000255000255000

Table 3: Example of Compiled Identification Sheet

2 TECHNICAL DATA

2.1 TemaKey TKL12 (RTU-L12 code 1500159XX)

Parameter	Value
Power Supply	$12V_{DC}\pm15\%$ 160mA (2W)
Weight	0.3 kg
Dimensions	156 x 40 x 27 mm (see Figure 14)
Degree of Protection	IP55
Operational Temperature	-20 to 60 °C
Storage Temperature	-20 to 70 °C
Relative Humidity of Storage	0 to 95 % without condensation
LED	1 LED tricolor Red / Green / Yellow
Buzzer	1
Inputs	2 supervised inputs with 4 statuses: normal, alarm, cut, short
Output OC 1	Electrical Locking Device Command Vmax = 28VDC I max = 100mA Vce(sat) max = 1,2V
Output OC 2	Lamp Command Vmax = 28VDC I max = 100mA Vce(sat) max = 1,2V
Antenna proxy	13,56MHz for 14443A / B cards Reading range: depending on technology of card. Typical 4 cm
LONWORKS®[2] Connection	"Free Topology" type connected with unshielded double twisted pair cable FT3150 Smart Transceiver, 78Kbps
Conformance to Norms	ϵ Directive EMC 89/336/EEC, 92/31/EEC, Low Voltage Directive 72/23/EEC, 93/68/EEC: EN60950 / EN55022-B / ETSI EN300-330 / EN55024
	FCC **FCC ID: HS9-RTU-L12** 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.

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[2] LONWORKS® is a trademark of the Echelon Corporation

2.1.1 Supplied Parts

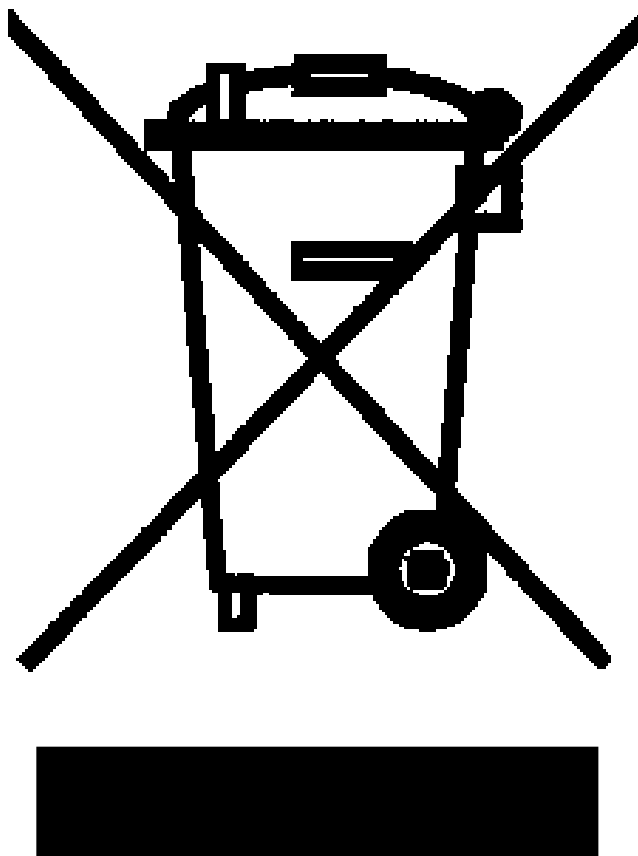|	
KIT of resistances for input balancing	2 White resistances 2 Yellow resistances
Fisher bolts for wall mounting	2 (S4 type) + screws
Fisher bolt for tamper	1 (S4 type) + screws
1N4004 Diode	2

2.1.2 Optional Parts

TORX TX10 Screwdriver	Code 1500108AA

2.2 Recycling

In application of directive 2002/96/EC regarding electrical and electronic waste devices, from 13 August 2005, Honeywell engages, when requested by the customer, to the collection, treatment, recovery, and proper disposal of all devices produced.

All users within the European Union are hereby informed of the requirement for the proper elimination of the product as regulated by laws, rules, and local procedures.
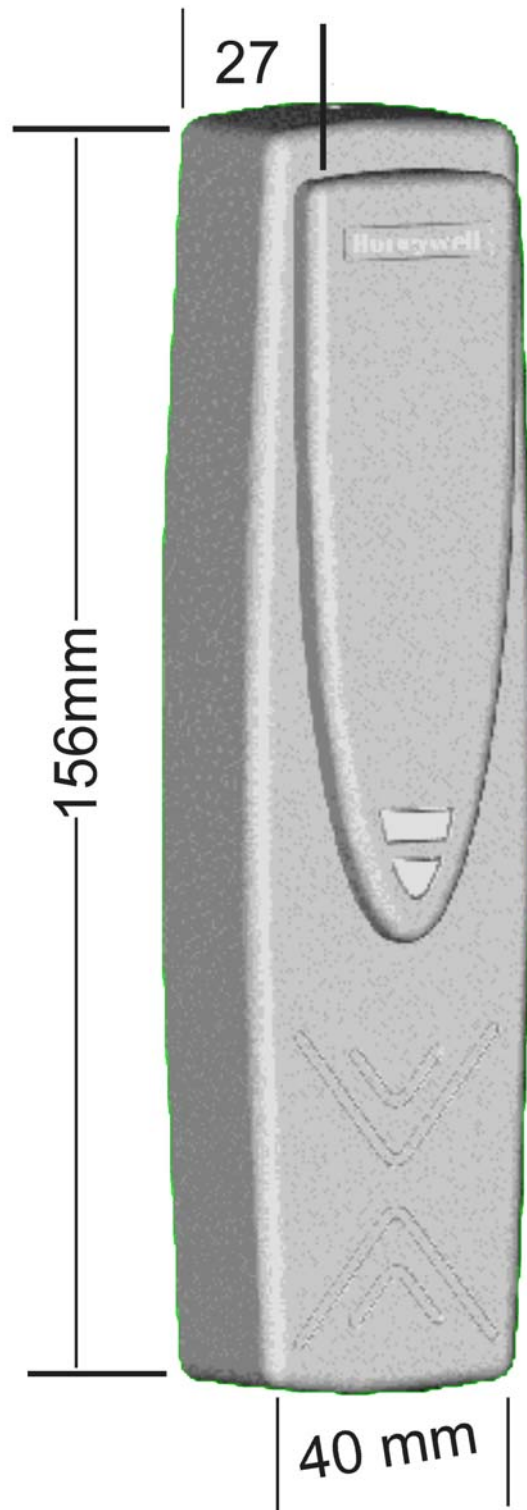
Figure 14: Temakey TKL12