

Temaline TK_S014 (RTU A08)



Installation Manual

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INTRODUCTION

What TK_S014 (RTU A08) is?

TK_S014 is a Temaline device acting as a single door controller.

It can manage up two third party Wiegand readers (on the two sides of the doors), the inputs / outputs used for the management of such readers (led and buzzers) and the inputs / outputs needed for the management of the door (door state, REX button, lock commands).

The device can be used to manage these two door scenarios:

- Reader on one side of the door, REX button on the other
- Readers on both the door sides



Be aware that, even if the device can manage two third party Wiegand readers, it cannot manage two different doors. When the device manages two readers the only allowed configuration is to have them on the two sides of the same door

The device needs to be wired by mean of a Lonwork connection to a Temaline TemaServer device that acts as a controller.

RTU A08 together with other Temaline devices

The RTU A08 device can be used together with other Temaline devices to compose a TemaKey; there are different TemaKey types that differ from the type of Human Machine Interface they have.

Each TemaKey consists of one or more RTU modules that must be positioned and connected to their respective wall attachment frames (RTU-Sxx) as indicated in the table below.

Here below the list of TemaKeys can be composed using the RTU A08 device and their characteristics.

Readers

Code	Composition	Notes
TK_S014	RTU-A08 + third party Wiegand reader	Weight=0.2Kg Power=0.9W Current=70mA (Excluding reader current)
	RTU-A08 + 2 third party Wiegand readers	Weight=0.2Kg Power=0.9W Current=70mA (Excluding readers current) The 2 readers are on the same door one in entry and one in exit direction

Interactive Terminals

Code	Composition	Notes
TK_D214	RTU-A08 + third party Wiegand reader + RTU-C02 + 2 RTU-S01	Weight=1.15Kg Power=6.2W Current=450mA (Excluding reader current)
	RTU-A08+ 2 third party Wiegand readers + RTU-C02 + 2 RTU-S01	Weight=1.15Kg Power=6.2W Current=450mA (Excluding readers current) The 2 readers are on the same door one in entry and one in exit direction

Compositions with phased out devices

Note: These compositions are done including some phase out devices cannot anymore be purchased. This list is left here just for maintenance reference.

Terminals

Code	Composition	Notes
TK_D014	RTU-C01 + RTU-A08 + RTU-S01 + third party Wiegand reader	Horizontal mounting. Weight=0.65Kg Power=2.8W Current=210mA (Excluding reader current)
	RTU-C01 + RTU-A08 + RTU-S01 + 2 third party Wiegand readers	Horizontal mounting. Weight=0.65Kg Power=2.8W Current=210mA (Excluding readers current) The 2 readers are on the same door one in entry and one in exit direction

Terminals with Keyboards

Code	Composition	Notes
TK_T014	RTU-C01 + RTU-T01 + RTU-A08 + 2 RTU-S01 + 1 third party Wiegand reader	Horizontal mounting. Weight=1.05Kg Power=3.3W Current=240mA (Excluding reader current)
	RTU-C01 + RTU-T01 + RTU-A08 + 2 RTU-S01 + 2 third party Wiegand readers	Horizontal mounting. Weight=1.05Kg Power=3.3W Current=240mA (Excluding reader current) The 2 readers are on the same door one in entry and one in exit direction

Interactive Terminals with Keyboards

Code	Composition	Notes
TK_T214	RTU-C02 + RTU-B01 + RTU-A08 + 2 RTU-S01 + 1 third party Wiegand reader	Horizontal mounting. Weight=1.4Kg Power=6.6W Current=480mA (Excluding reader current)
	RTU-C02 + RTU-B01 + RTU-A08 + 2 RTU-S01 + 2 third party Wiegand readers	Horizontal mounting. Weight=1.4Kg Power=6.6W Current=480mA (Excluding reader current) The 2 readers are on the same door one in entry and one in exit direction

Related documentation

Document	Content
EBI Temaline Interface - Temaline Access Control Configuration Guide	Further information on the EBI Tema system, complete commissioning steps and system configuration are included in the, which is provided with EBI documentation package.
Temaline - installation in Harsh Environment:	It is a whitepaper with Temaline system rules on this topic.

PREPARING FOR INSTALLATION

Contents of the kit

Before you begin, unpack the shipment and check the parts list against the components in the shipment.

Your shipment should contain:

- RTU A08 device
- Support kit with the following:
 - 2 white resistors (392Ω 1% 1/4W)
 - 2 yellow resistors (1210Ω 1% 1/4W)
 - 2 diodes (1N4004)
 - 4 self-tapping screws (used to screw the device cover)

Mounting tools

The following screwdrivers are required for the installation:

- One small flat screwdriver
- One 0-1 flat head screwdriver

System Architecture

This is a typical system architecture in which the RTU-A08 is inserted:

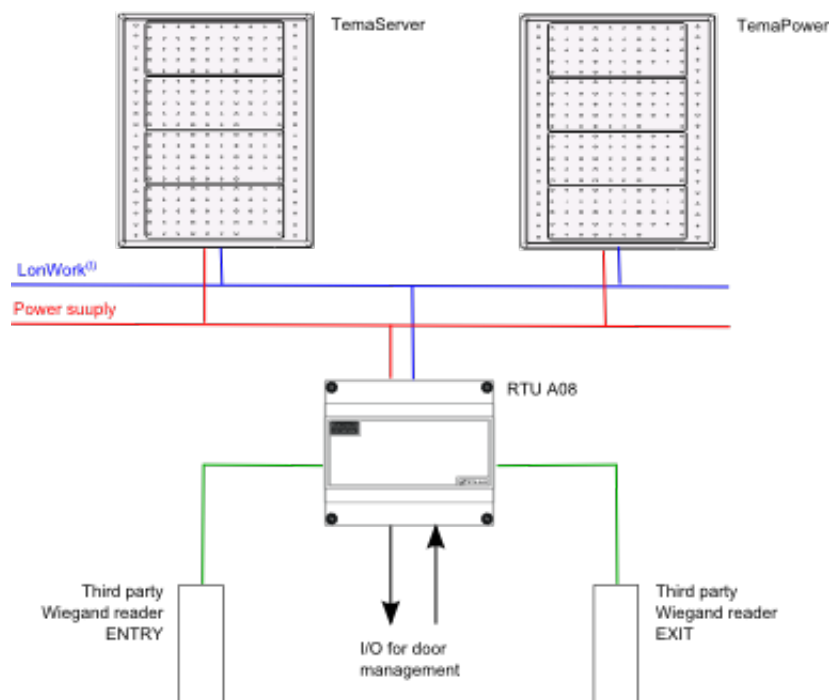


Figure 1 RTU-A08 architecture

The devices represented are:

- TemaServer: is the controller that manages the RTU-A08. It can be both a TS AC and a TS2 device
- TemaPower: is the power supply used to supply the devices. It can be one Temaline TPU-xx device or a third party power supply.
- Third Party Wiegand readers: are used to control the access to the door on entry and Exit direction

The connections shown are:

- The Power supply connection: it connects the Power Supply device whit other Temaline devices
- The LonWorks connection: to connect the TemaServer with the RTUs
- The Input and Output are used to connect the physical door managed (lock, Door sense, REX and others)
- The Reader connections: are Wiegand lines that connect RTU-A08 with the third party readers.

Wiring Characteristics

Power supply wire

The RTU is powered at low voltage (12V_{DC}) by a battery-operated power supply module (RTU-Qxx). When determining the correct size for power cables, refer to the table below. (Voltage cable drop max = 0,7V)

Cable Length (m) = $0,7V / (I [A] \text{ load} \times 2 \times (R [\text{Ohm/km}] / 1000))$

Type of cable			Length (m) in relation to base load					
AWG	mm ²	Ohm/Km	100 [mA]	200 [mA]	500 [mA]	1 [A]	2 [A]	5 [A]
14	2	8.8	398	199	80	40	20	8
16	1.3	14	250	125	50	25	13	5
18	0.9	21	167	83	33	17	8	3
20	0.6	34	103	51	21	10	5	2
22	0.35	52	67	34	13	7	3	1

Table 1. Length/Capacity of Power Cables (m)

LONWORKS® Data Cables

The LONWORKS® data cable must be twisted-pair.

In a free topology configuration, the total length of the sections must not exceed 500m.

In a bus configuration, the total length of the sections must not exceed 2700m.

In a free topology configuration, activate the 51 ohm terminator by placing the appropriate jumper on the related TemaServer device:

- For TS AC close the jumper on LonWorks plug-in.
- For TS2 close JP1 on the LonWorks MIP board.

For further details please refer to the related TemaServers Installation guides.

In a bus configuration, place two terminators (with resistance values of 100ohm 1% ½W) at each end of the bus.

Check that the length of the LONWORKS® data cable corresponds to the norms indicated in Table 2.

Type of cable			Length [m] in relation to cable capacity				
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
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Table 2. Length/Capacity of LONWORKS® Data Cables (m)

The FTT10A Echelon® v1.2 User Guide recommends the cables indicated in Table 3.

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 3. Recommended LONWORKS® Cables

Input wires

Use a twisted pair cable for the contacts connections.

For outdoor wiring is mandatory to use shielded cables. The cables' shielding must be connected to the respective ground connectors (-V).

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

The following table lists wire gauges and distances for Inputs.

Cable type			Max distance (m)*
AWG	mm2	Ohm/km	
12	3.3	5.7	2193
14	2	8.8	1420
16	1.3	14	893
18	0.9	21	595
20	0.52	34	368
22	0.35	52	240
24	0.2	85	147
26	0.13	137	93

Table 4 Length of Input cables

*One-volt voltage drop is considered typical.

Readers wires

The wires used to connect the RTU-A08 to the reader(s) are those specified into the reader technical specification.

MOUNTING THE DEVICE

Mounting on DIN/omega rail

The device is mounted on standard DIN/omega rail; to mount it you should follow these steps:

1. Hook the bottom of the RTU-A08 onto the upper margin of the DIN/omega Rail.
2. Push until it clips onto the rail. (See Figure 2).

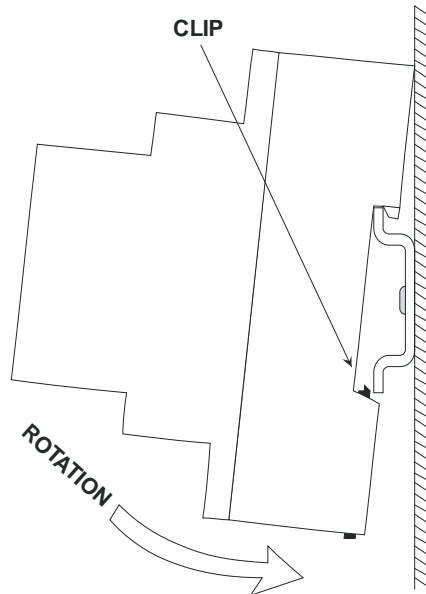


Figure 2. Mounting onto the DIN Rail

Mounting the device into enclosures

Often a device is mounted, together with others, inside large enclosures with DIN/omega rails that provide enough space for access and wire.

When a device need to be mounted into a small enclosure it minimum size must follow the dimensions reported in the next figure.

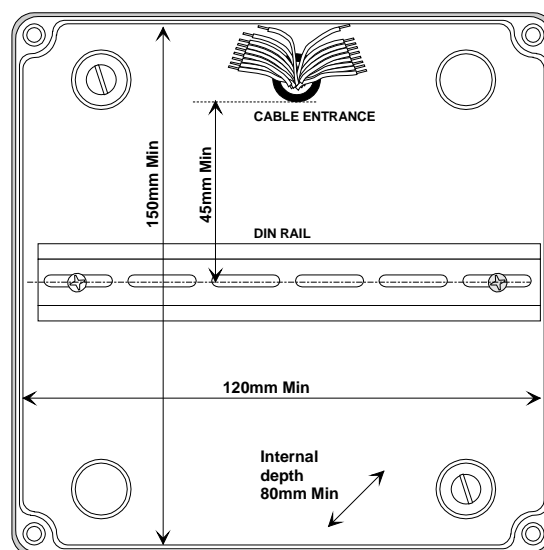


Figure 3. Box with DIN Rail

Closing the RTUA08 Module

To close the unit, follow these steps (see Figure 4):

- Clip the cover onto the module.
- Screw on the module cover with the 4 self-tapping screws (requires a 3mm cross-head screwdriver).

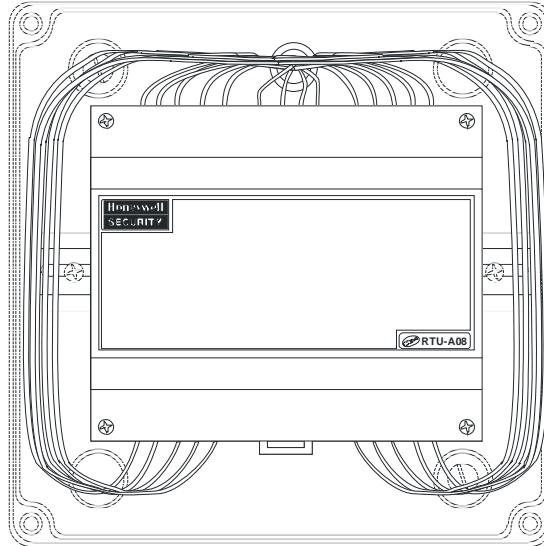


Figure 4. Closing the RTUA08 Module

WIRING OPERATION

Elemental Detail

Figure 12 shows a detail of the electronic board, including the positions of the main connectors and service elements.

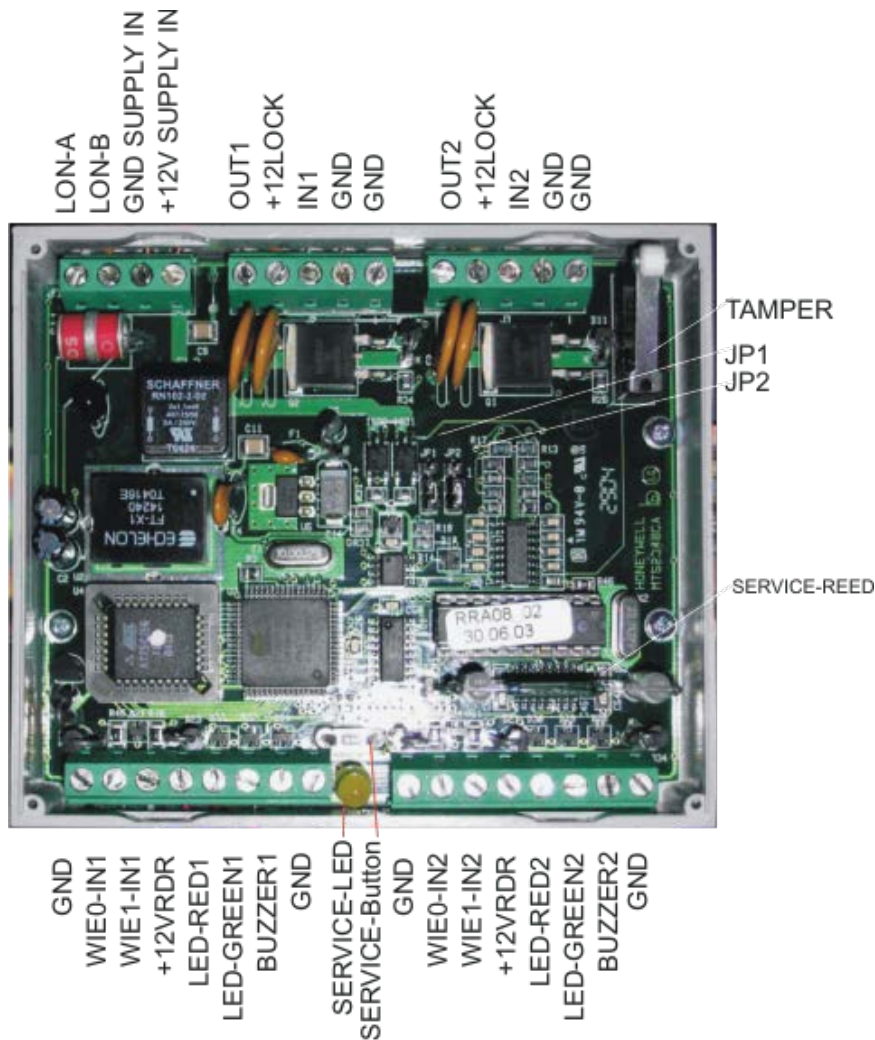


Figure 5. Elemental Detail

Connection of power supply cables

The RTU A08 device must be powered with a 12V DC power supply. To determine the correct size of the power cable please refer to Table 1. Length/Capacity of Power Cables (m)Table 1.



Figure 6 Power Supply connection

Connection of the Lonwork cables

It is possible to connect TemaServer and the RTU in two different ways:

- Daisy chain (also known as Bus)
- Free topology (also known as Star)

Based on the type of connection used in your plant some terminator resistors are required; if you don't install them the RTU A08 device will not work in a proper way.

Daisy chain connection (BUS)

The LONWORKS® data cable must be twisted-pair.

In a bus configuration, the total length of the sections must not exceed 2700m.

Check that the length of the LONWORKS® data cable corresponds to the norms indicated in Table 2.

In a bus configuration, place two terminators (with resistance values of 100ohm 1% ½W) at each end of the bus.

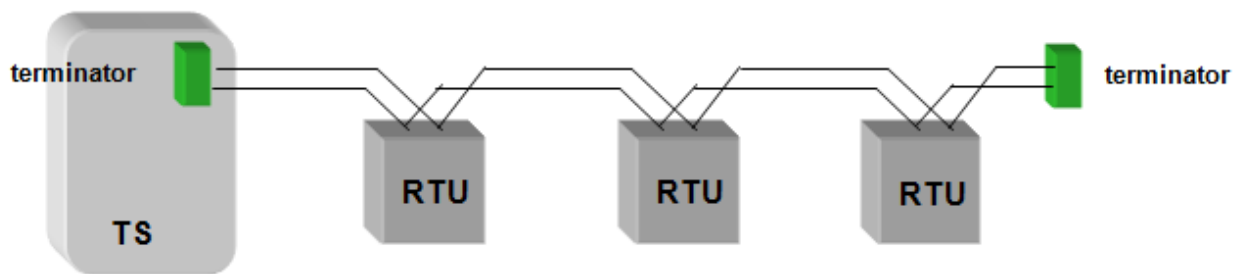


Figure 7 Daisy chain (BUS) connection

Free topology connection (STAR)

The LONWORKS® data cable must be twisted-pair.

In a free topology configuration, the total length of the sections must not exceed 500m.

Check that the length of the LONWORKS® data cable corresponds to the norms indicated in Table 2

In a free topology configuration, activate the 51 ohm terminator by placing the appropriate jumper on the related TemaServer device:

- For TS AC close the jumper on Lonwork plug-in.
- For TS2 close JP1 on the Lonwork MIP board.

For further details please refer to the related TemaServers Installation guides.

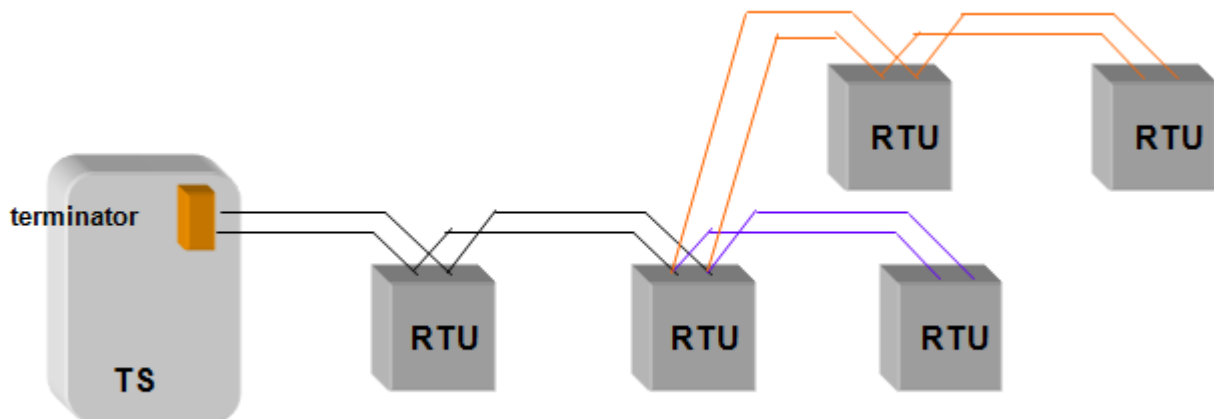


Figure 8 Free topology connection

Lonwork cables connection

Screw the twisted pair cable to LON-A and LON-B

The polarity of the LONWORKS® cables is not significant.



Figure 9 LON cable connectuion

A very common error in Lonwork cabling is to forget to terminate the lines; this can cause a variety of unpredictable errors in the system; so please remember to add resistors terminators on the LON cabling!

Refer to the above chapters on the different Lonwork wiring typologies for the related terminators details.

Connections of Reader cables

Connect the shielded cables coming from the readers to the terminal screws on the RTUA08 as shown in Figure 10. The shields must be connected directly to the main earth ground.

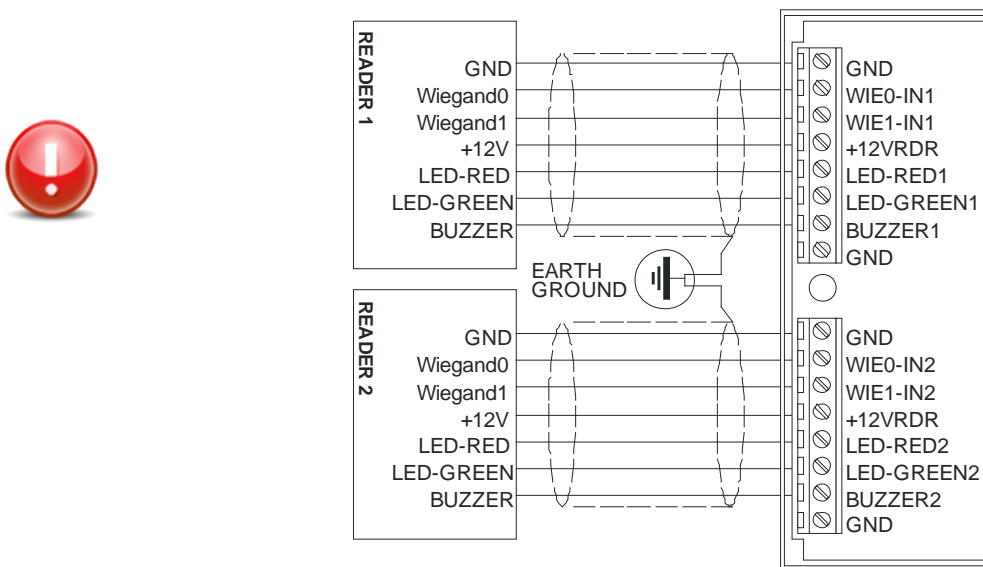


Figure 10. Cable Connection to RTU A08 Wiegand Module

Connecting the door

Door Connection (Using +14V Internal Power Supply)

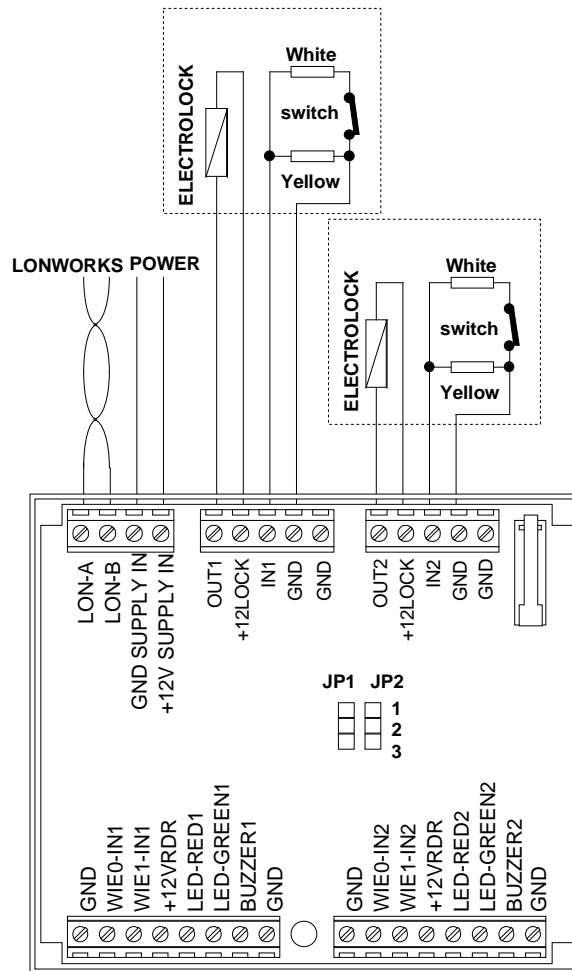


Figure 11. Door Connection Using +14V Internal Power Supply

Be aware that, even if the diode is already embedded in the unit, in some cases (long cable installed near the inputs cables) may be useful to add an external diode provided with the unit close to the relay device



Door Connection (Using +V External Power Supply)

You may power the electro lock doors using an external isolated power supply (Voltage between 10 and 28VDC).

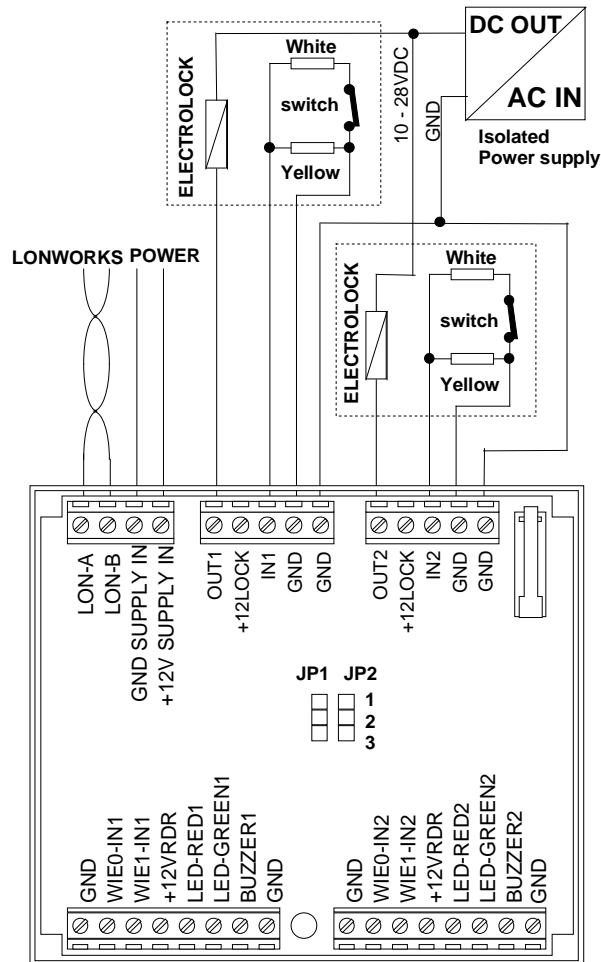


Figure 12. Door Connection Using +V External Power Supply



Be aware that, even if the diode is already embedded in the unit, in some cases (long cable installed near the inputs cables) may be useful to add an external diode provided with the unit close to the relay device

Setting the normality value for the outputs

Jumpers JP1 and JP2 are used to set the normality value for the Output of the device. The factory setting for the jumpers is Normally Open (NO).

- JP1 sets the normality value for the OUT 1
- JP2 sets the normality value for the OUT 2

When the jumper is set between position 2 and 3 the normality value for the related output is Normally Open (NO). This is the factory position for the jumper.

When the jumper is set between position 1 and 2 the normality value for the related output is Normally Closed (NC).

Rules for installation in harsh environment

For complete system details on this topic please refer: Temaline - installation in Harsh Environment whitepaper

General rules

In case of installation of the device in harsh environment apply the following rules:

- All the cables must run into an isolated and dedicated track;
- The cables must not run parallel to high voltage cables (> 50Vac).
- Distance from high electromagnetic source must be > 10mt (an Electromagnetic source is a device that generates high electromagnetic noise at frequency from 150Kz to 1 Ghz (tested up to 10V/m (61000-4-6)) or Power frequency magnetic noise (tested up to 100V/m (61000-4-8)).

Cables rules

- INPUT cables (door side) – shielded to local Earth ground (Shield type: braid shield 90% coverage)
- OUT Cables (door side) – shielded to local Earth ground (Shield type: braid shield 90% coverage)
- POWER SUPPLY cables – connected to RTUQs or other PWS - unshielded
- LON cable – unshielded – twisted pair
- WEIGAND cable (reader side) - shielded to local Earth ground – length max 3mt (Shield type: braid shield 90% coverage)

ACTIVATION

This chapter shows only the preliminary steps required for the RTU activation.

The complete configuration of the device is beyond the scope of this manual; please refer to **EBI Temaline Interface - Temaline Access Control Configuration Guide** for further details on these activities.

Checking the communication between RTUA08 and TemaServer

To do this verification procedure it is required to:

- Have the RTU A08 wired with the TemaServer device that manages it through the Lonwork wire.
- RTU A08 powered and working
- The TemaServer powered and working

To check the RTU A08 communication, you can activate the device service pin using the button located inside the module.

To do this, follow these steps:

1. Push the internal «service» button
2. The TemaServer will send a wink, in response to the service pin that will cause the yellow Led to remain illuminated for a couple of seconds. This allows you to verify that communication to and from the TemaServer is operational
3. Make sure that the yellow service LED is off at the end of the operation.

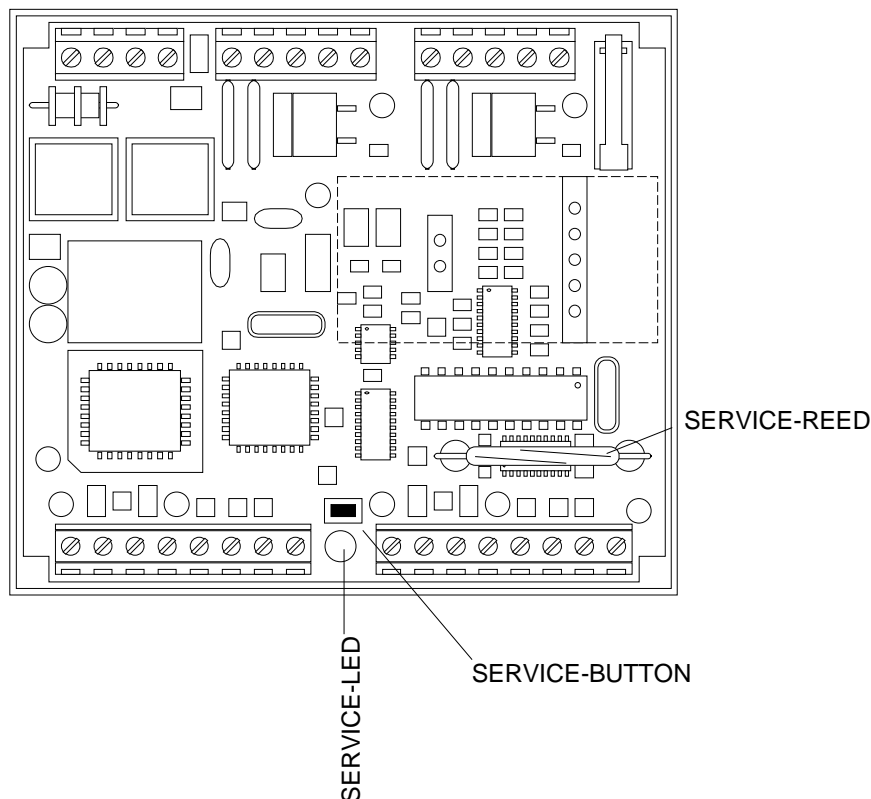


Figure 13. RTUA08 Service Elements

Collecting device information

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).

The information collected can then be used for the RTU configuration on EBI Temaline application.


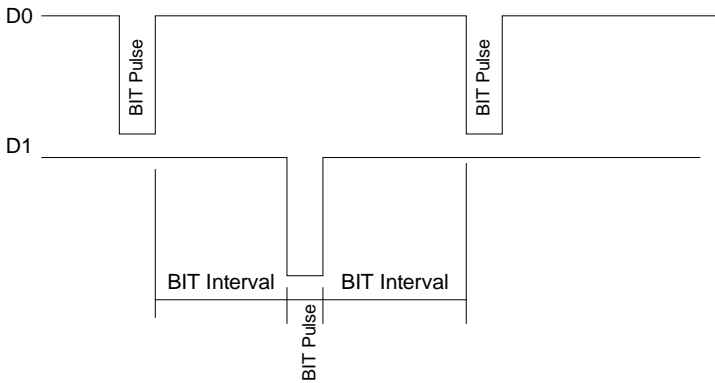
Description of location <i>Office entrance area, first floor - staircase A</i>	
Description of TemaServer <i>Panel 2 entrance area, first floor - staircase A</i>	
RTU <i>A08</i>	<div> <div> PROG.ID= 4896873498696586 <small>(2/5 INTERLEAVED - DECIMAL)</small> </div>  <div>255000255000255000</div> </div>
RTU -	
RTU -	
RTU -	

Table 5. Example of Completed Identification Form

TECHNICAL DATA

Parameter	Value
DC power supply	12V +/-15% 70mA [nominal internal] [up to 2.5A when driving power loads]
Weight	0,2 Kg
Dimensions (LxWxH)	105x93x61 mm
Mounting	Standard DIN/omega rail
Operating temperature	-10 ÷ 55°C
Storage temperature	-20 ÷ 70 °C
Storage relative humidity	0 ÷ 90 % without condensation
LONWORKS® connection	Unshielded twisted-pair cable in free topology connection FT3150 smart transceiver 78Kbps
Controlled Inputs	Type: Controller on 5 states (open, close, cut, short, tamper) Number: 2 Supply Voltage: 0V...+10V Supply current: 0...3 mA Voltage (absolute max): -24V...+40V Wire length connection: total resistance < 10 Ohm – not shielded Min detection time: 250 ms
Wiegand Inputs	Type Wiegand (normally high) Number: 2 Voltage: 0V...+5V nominal (TTL) +14V Max Timing BIT Pulse width: min 50us – max 10ms BIT Interval time: min 500us – max 20ms  Wire type and length connection: see the reader installation manual – usually shielded
Power supply output for readers	Voltage: 12V +/-15% (line voltage) Current: 200mA Max (per channel) Wire length connection: it depends on cable diameter, reader current sink and reader min power supply– usually shielded – see reader installation manual. Example: Cable 0,35mmq: Resistance 52 Ohm/Km Reader: V min 10 VDC Current max 50mA

	Power supply min : $12V - 15\% = 10,2V$ Voltage drop max : $10,2 - 10 = 0,2V$ Cable resistance: Voltage drop / reader current max = $0,2 / 50mA = 4$ Ohm Cable length (m: Resistance / (cable resistance / 1000) / 2 = $= 4 / (52 / 1000) / 2 = 38$ mt
Outputs to control LEDs and buzzer	Type: Open Collector Number: 3 each Wiegand channel Function: Red LED, Green LED, Buzzer Voltage: 0V...+14V max Current: 80mA Max Wire length connection: see installation manual – usually shielded
Outputs	Type: Power Open Collector (Drain) Number: 2 Voltage: 10V...+14V (internal Power supply) Voltage (absolute max): 10V...+30V (from external Power supply). Current: 1,2A [5A / 2sec peak max – inductive load] Normality ¹ NO or NC via JP1 and JP2 Default = NO Wire length connection: it depends on cable diameter, load current sink and load min power supply – Not shielded

¹ In the RTUA08 without jumpers the normality OUT status is NO

REGULATION COMPLIANCE

CE Compliance



Company name: Honeywell S.r.l. Via Philips, 12 20052 Monza Italy

Product name: TK_S014M (RTU A08M)

Is in conformity with the European Union following harmonization legislation:

Directives:

Electromagnetic Compatibility Directive (2014/30/EU)

General Product Safety Directive (2001/95/EC)

RoHS EU Directive (2011/65/EU)

Standards:

EN 55022:2010 Class B

EN 50130-4:2011

EN 55024:2010

EN 60950-1:2006+A11:2009 +A1:2010 +A12:2011+A2:2013

EN 50581:2012

FCC Notice



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.

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, this 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.

Canadian and United States UL listed



UL60950

Reference File: E221152.

UL's investigation of this product has been completed under the above Reference Number and the product was determined to comply with the applicable requirements.

RoHS compliance



2011/65/EU

The device is compliant with the European Parliament and Council Directive on the restriction on the use of certain Hazardous Substances in electrical and electronic equipment devices.

WEEE Compliance



2012/19/EU

In application of directive 2012/19/EU regarding waste electrical and electronic apparatus (WEEE), effective beginning 14 February 2014, Honeywell commits, when requested by the customer, to the collection, treatment, recovery, and disposal of 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








China RoHS declaration



This product contains toxic and hazardous substances or elements over the defined maximum concentration values defined by the regulation. The product can be used safely during its environmental protection use period (15 years) and needs to enter into the recycling system when this period is over.

MEANING OF GRAPHICAL SYMBOLS USED

In compliance with “EN60950 Amendment 2 – Information Technology – Safety, General Requirements” this appendix shows the list of graphical symbols used in the product and their meanings.

Symbol	Meaning	Located on
	Keep away from rain To indicate that the transport package shall be kept away from rain and in dry conditions.	Carton Box
	Fragile; handle with care To indicate that the contents of the transport package are fragile and the package shall be handled with care.	Carton Box
	This way up To indicate correct upright position of the transport package.	Carton Box
	Conformité Européenne To indicate the manufacturer declares that the product meets the requirements of the applicable EC directives	Label
	Canadian and United States UL Listed To indicate that the product meets the requirements of the UL60950 regulation	Label
	Recycling To indicate compliance with EC directive regarding waste electrical and electronic apparatus.	Label
	China RoHS environmental protection use period Indicates the environmental protection use period of the product.	Label