



 **temaline Modular terminal**

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## Installation Manual

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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.

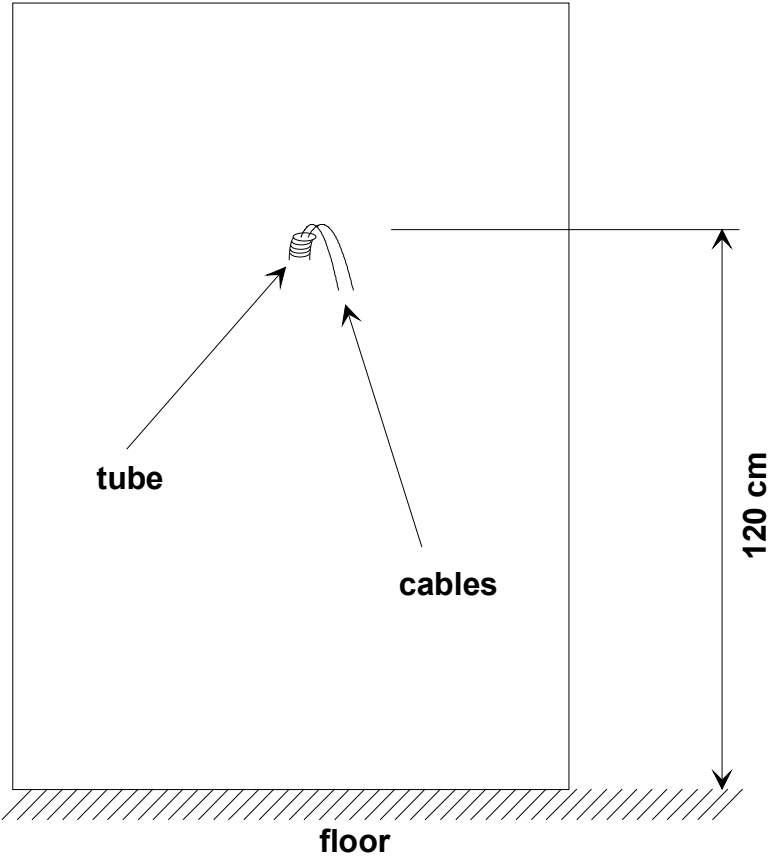
Cet appareil numérique de la classe B respecte les exigences du Règlement sur le matériel brouilleur du Canada.

# PRELIMINARY OPERATIONS

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## 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*

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# Arranging the Cable Tubes and Junction Boxes

All the cables consist of 4 wires that must be connected in parallel from one node to the next. It is possible to link nodes in free topology, i.e. by means of a star or bus configuration.

## Cabling: Recommendations

Figure 2 provides an example of a typical free topology installation.

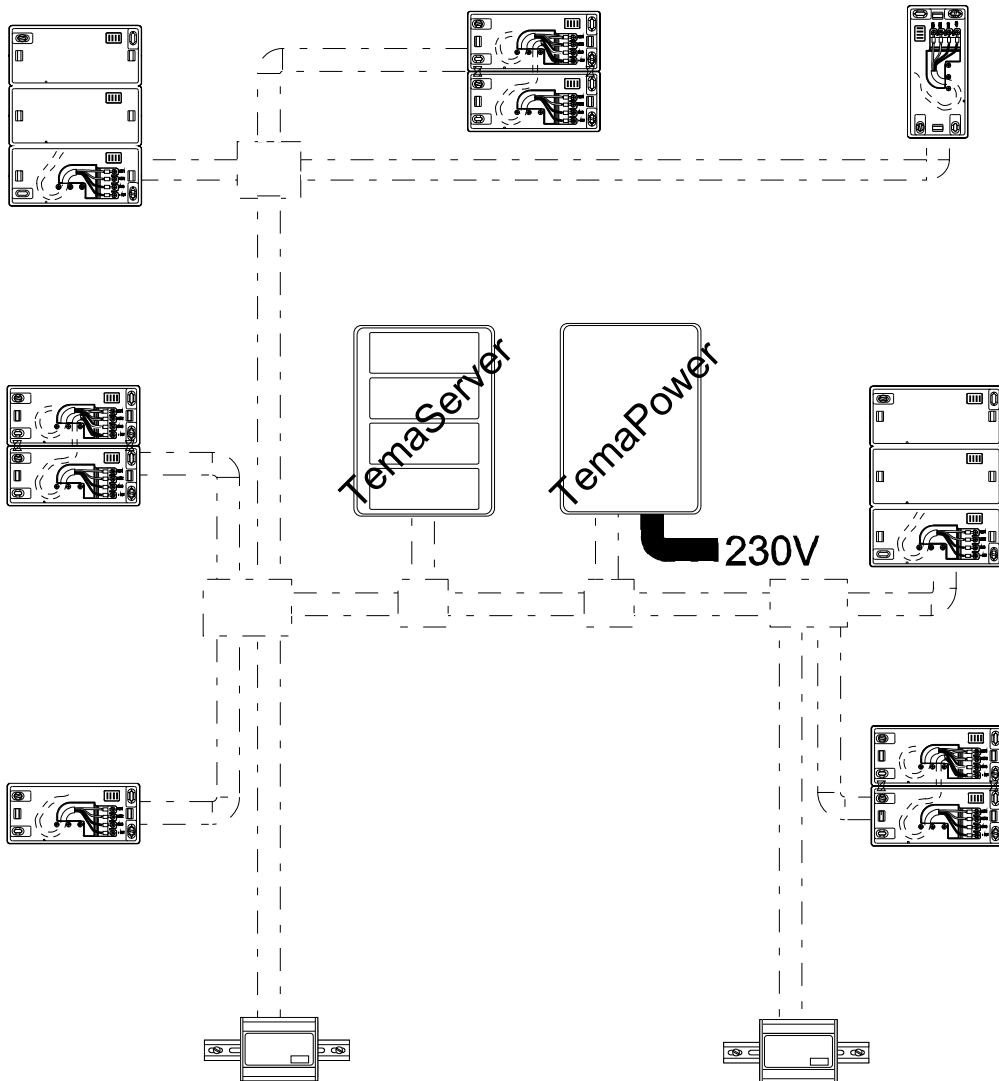
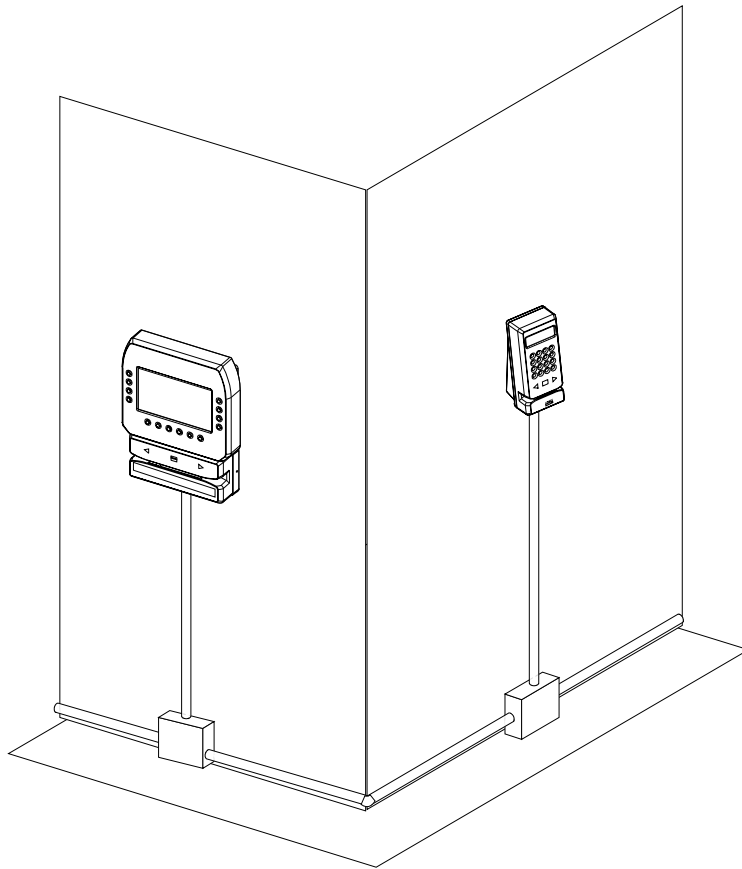


Figure 2: Example of a free topology installation

If you want to mount the tubes on the surface of the walls, it is advisable to place the junction boxes under each terminal (see example in Figure 3).



*Figure 3: Location of the junction boxes*

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## Electrical Connections

The RTU is powered at low voltage ( $12V_{DC}$  120mA) by a battery-operated power supply module (RTU-Qxx). When determining the correct size for power cables, refer to the table below.

Type of cable			Length (m) in relation to effective load					
AWG	mm <sup>2</sup>	ohm/Km	100 [mA]	200 [mA]	500 [mA]	1 [A]	2 [A]	5 [A]
12	3,3	5,7	1754	877	351	175	88	35
14	2	8,8	1136	568	227	114	57	23
16	1,3	14	714	357	143	71	36	14
18	0,9	21	476	238	95	48	24	10
20	0,6	34	294	147	59	29	15	6
22	0,35	52	192	96	38	19	10	4
24	0,2	85	118	59	24	12	6	2



## LONWORKS<sup>®</sup> Data Cables

- The LONWORKS<sup>®</sup><sup>1</sup> 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 each end of the bus
- Check that the length of the LONWORKS<sup>®</sup> data cable corresponds to the norms indicated in Table 1.

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

Table 1: Length/capacity of LONWORKS<sup>®</sup> data cables (m)

<sup>1</sup> LONWORKS<sup>®</sup> is a trademark of Echelon Corporation

- The FTT10A Echelon<sup>®</sup> v1.2 User Guide recommends the cables indicated in Table 2.

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

*Table 2: Recommended LONWORKS<sup>®</sup> cables*

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# Mounting the Unit on the Wall

## Horizontal Assembly - Single Module

To assemble the unit in a horizontal position, follow these steps:

1. Drill two holes in the wall (to accommodate the 2 plastic dowels), so that the frame will cover the hole through which the cables pass.
2. Insert the cables in the cable clamp without pulling out the screws.
3. Use the dowels to fasten the frame to the wall. Make sure that the lamellar connector is in the **UP** position.
4. Adjust the length of the cables so that they protrude by ~10cm from the wall, and fasten them to the cable crimp.
5. Fasten the cable crimp to the contacts in the direction shown in Figure 4.
6. Place the remainder of the cable inside the frame and lock the cable clamp.

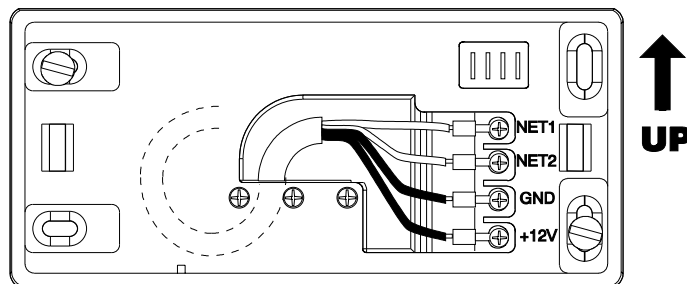


Figure 4: Wall position – horizontal position (single module)

## Horizontal Assembly - Triple Module

To assemble the unit in a horizontal position, follow these steps:

1. Drill two holes in the wall (to accommodate the 2 plastic dowels), so that the frame will cover the hole through which the cables pass.
2. Insert the cables in the cable clamp without pulling out the screws.
3. Use the dowels to fasten the frame to the wall. Make sure that the lamellar connector is in the **UP** position.
4. Adjust the length of the cables so that they protrude by ~10cm from the wall, and fasten them to the cable crimp.
5. Fasten the cable crimp to the contacts in the direction shown in Figure 5.
6. Place the remainder of the cable inside the frame and lock the cable clamp.

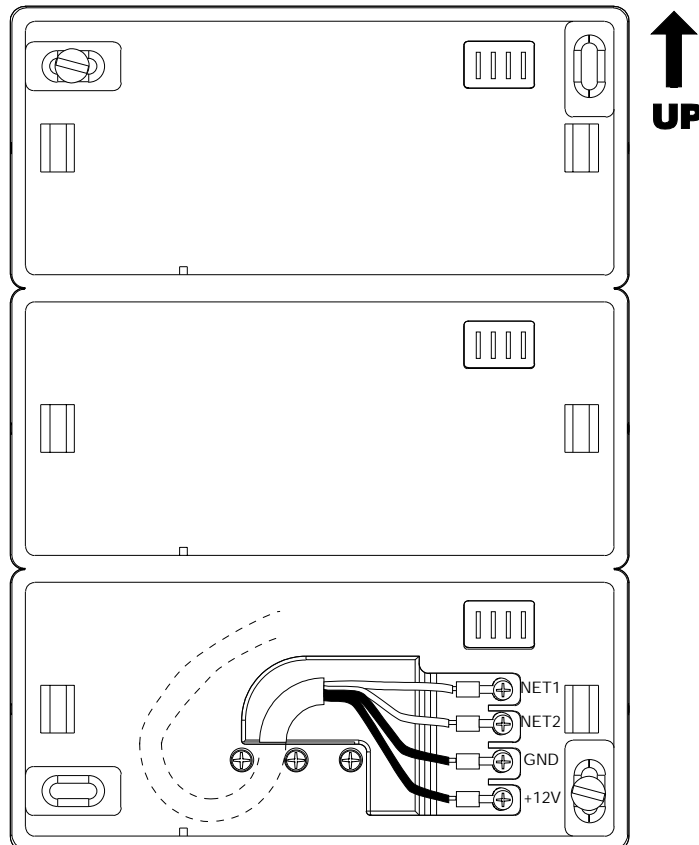


Figure 5: Wall position – horizontal position (triple module)

## Combined Assembly - Single and Triple Modules

A combined wall assembly of single and triple modules allows you to create units consisting of 2, 4 and 5 units. This procedure consists of the following steps:

1. Drill the necessary holes in the wall (2 plastic dowels for each module), so that the lower plate will cover the hole through which the cables pass.
2. Insert the cables in the cable clamp without pulling out the screws.
3. Link the frames together by inserting the two enclosed attachment clips at the rear of the frames (see Figure 6 and Figure 7).
4. Use the dowels to fasten the frame to the wall. Make sure that the lamellar connector is in the **UP** position.
5. Adjust the length of the cables so that they protrude by ~10cm from the wall, and fasten them to the cable crimp.
6. Intertwine the terminators of the cables from the wall and the extension cable terminators, and fasten them to the cable crimps.
7. Fasten the cable crimp to the contacts in the direction shown in Figure 6 and Figure 7.
8. Place the remainder of the cable inside the frame and lock the cable clamp.

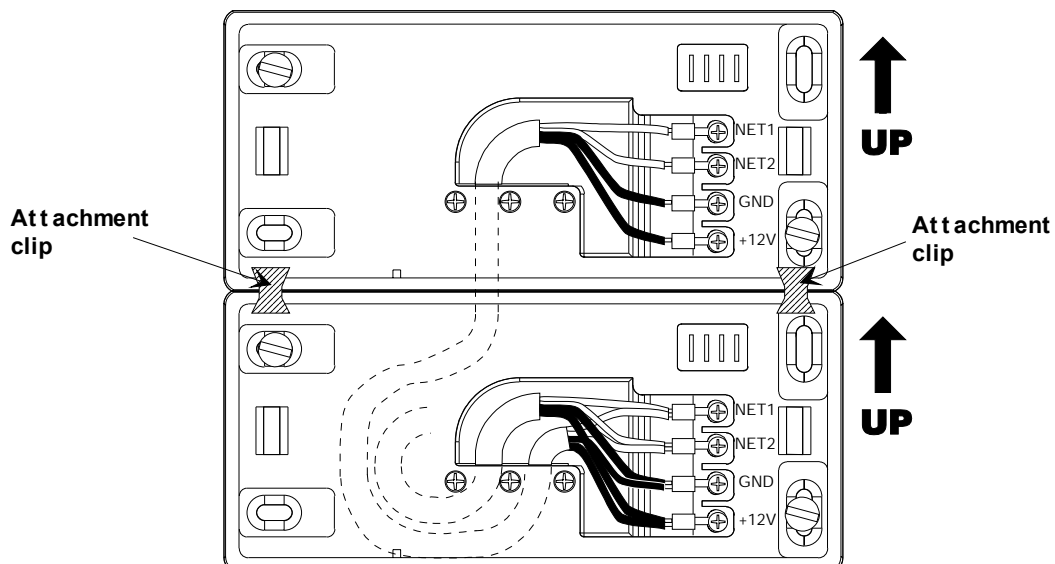


Figure 6: Combined assembly of two single module wall units

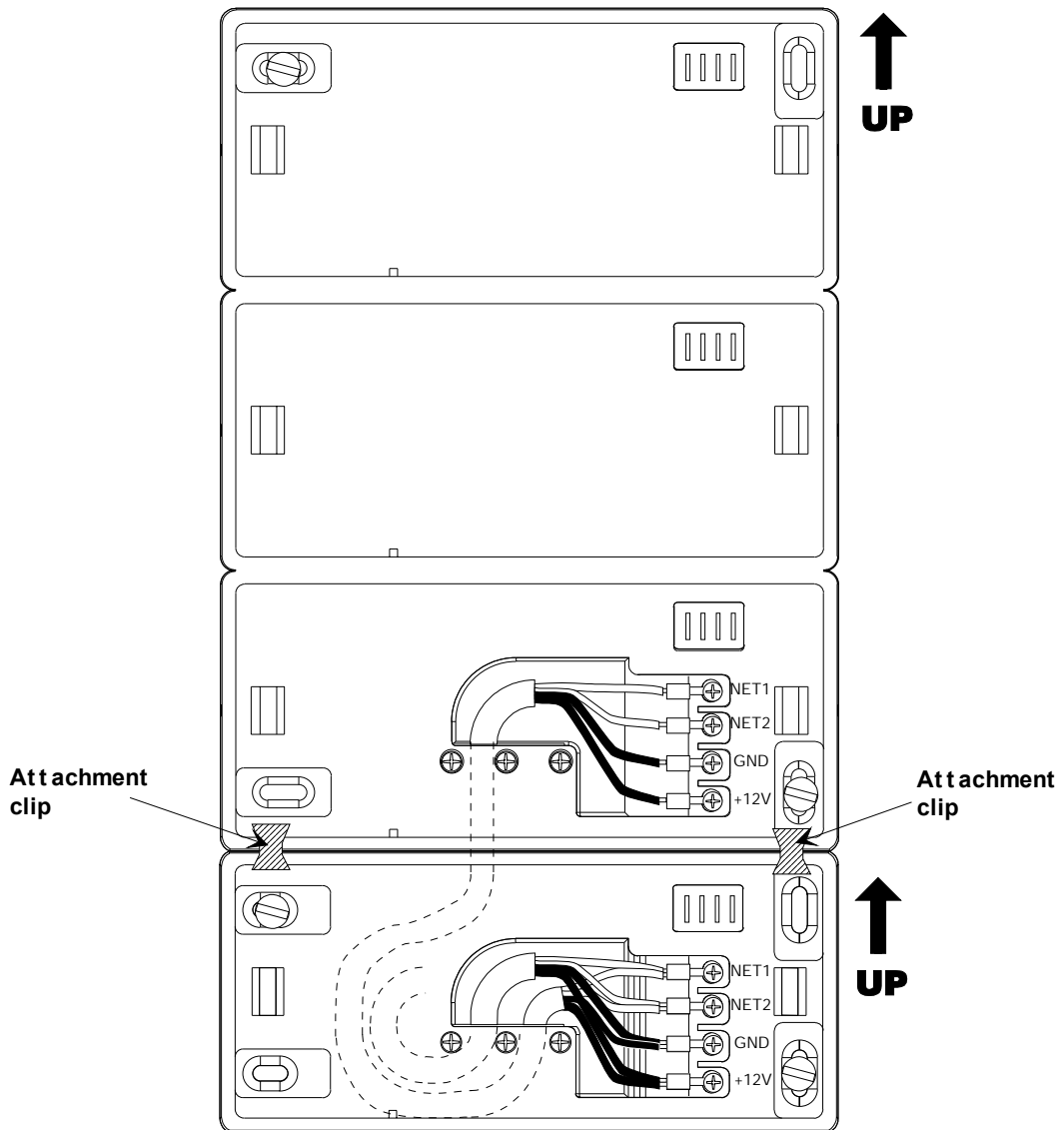


Figure 7: Combined assembly of single and triple module wall units

## Fastening the Cables

Fasten the cable clamps to the cable bar so that the cables are arranged towards the **inside** of the frame (see Figure 8).

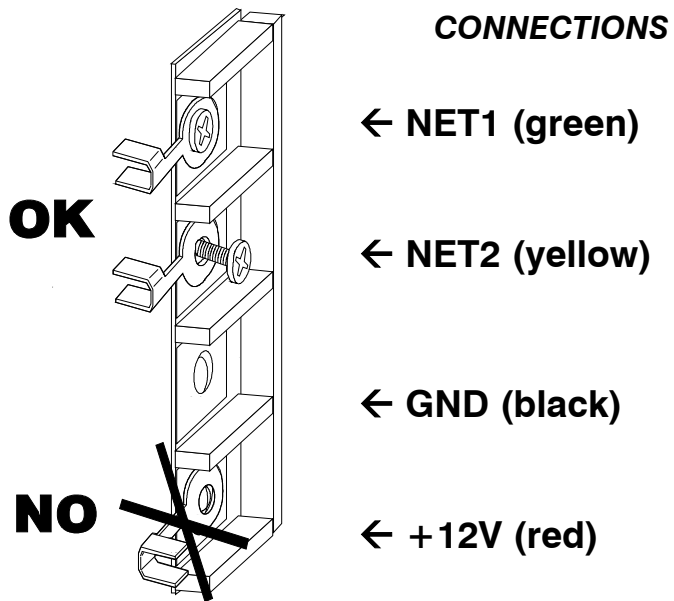


Figure 8: Fastening the cables

## Vertical Assembly

To assemble the unit in a vertical position, follow these steps:

1. Drill two holes in the wall (to accommodate the 2 plastic dowels), so that the frame will cover the hole through which the cables pass.
2. Insert the cables in the cable clamp without pulling out the screws.
3. Use the dowels to fasten the frame to the wall. Make sure that the lamellar connector is in the **UP** position.
4. Adjust the length of the cables so that they protrude by ~10cm from the wall, and fasten them to the cable crimp.
5. Fasten the cable crimp to the contacts in the direction shown in Figure 9.
6. Place the remainder of the cable inside the frame and lock the cable clamp.

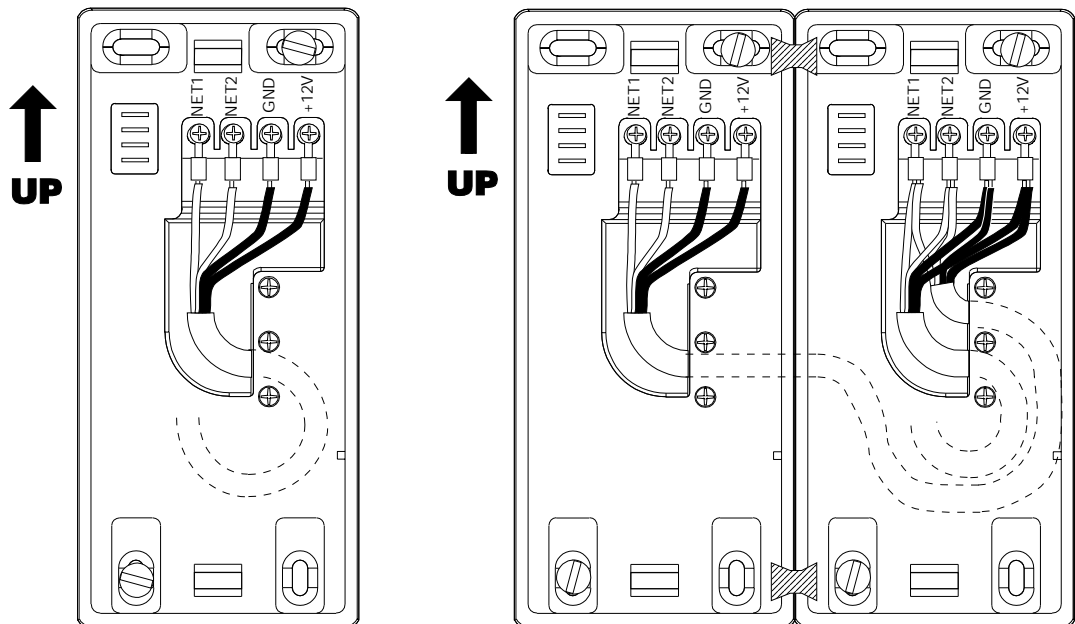


Figure 9: Wall position – vertical assembly



## Channeling the Cables from the Bottom of the Box

As an alternative, you can channel the cables so that they exit from the bottom of the frame. This alternative procedure consists of the following steps:

1. Drill a hole in the wall so that the hole from which the cables exit is in the center of the lower plate.
2. Break off the lower removable tab from the upper support.
3. Break off the upper and lower tab from the lower support.
4. Insert both the cables from the wall and the remainder of the cable in the cable clamp (be careful not to pull out the screws).
5. Use the dowels to attach the frame to the wall.
6. Adjust the length of the cables so that they protrude by ~10cm from the wall.
7. Roll up the terminators of the cables from the wall and the extension cables, and fasten them to the cable crimps (see Figure 10).
8. Fasten the cable crimp to the contacts in the direction shown in Figure 10.
9. Place the remainder of the cables inside the frame and lock the cable clamps.

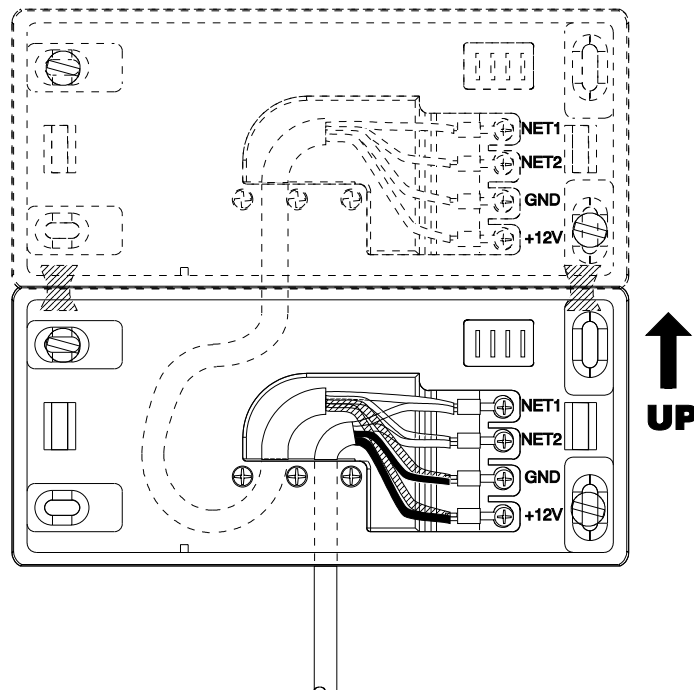



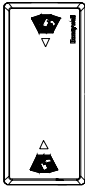

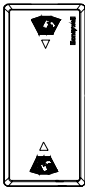
Figure 10: Channeling the cables from the bottom of the box

# INSTALLATION

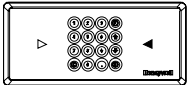

## Combining the Modules

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.

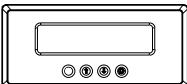
### Reader

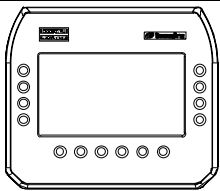
Code	Grouping	Horizontal	Vertical	Notes
<b>TK-S07</b>	1 x RTU-B07 1 x RTU-S01			Weight=0.45Kg Power=0.8W Current=60mA
<b>TK-S012</b>	1 x RTU-B12 1 x RTU-S01			Weight=0.45Kg Power=1.0W Current=90mA

### Keyboards

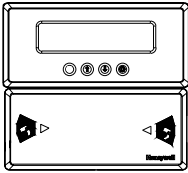
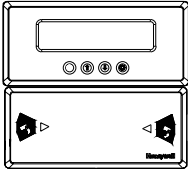
Code	Grouping	Horizontal	Vertical	Notes
<b>TK-S31</b>	1 x RTU-T01 1 x RTU-S01			Weight=0.4Kg Power=0.4W Current=30mA

### Display

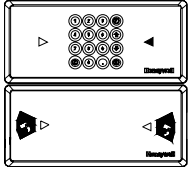
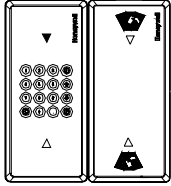
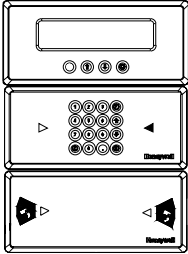
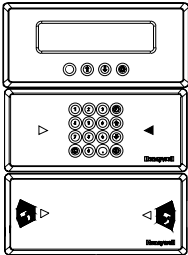
Code	Grouping	Horizontal	Vertical	Notes
<b>TK_S21</b>	1 x RTU-C01 1 x RTU-S01		NO	Weight=0.45Kg Power=1.9W Current=140mA
<b>TK-S22</b>				

	1 x RTU-C02 2 x RTU-S01		NO	Weight=0.95Kg Power=5.2W Current=380mA
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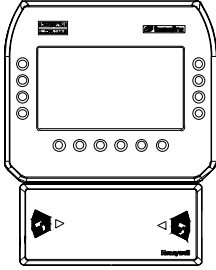
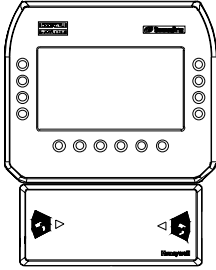
## Terminals

Code	Grouping	Horizontal	Vertical	Notes
<b>TK-D07</b>	1 x RTU-C01 1 x RTU-B07 2 x RTU-S01		NO	Weight=0.9Kg Power=2.7W Current=200mA
<b>TK-D012</b>	1 x RTU-C01 1 x RTU-B12 2 x RTU-S01		NO	Weight=0.9Kg Power=2.9W Current=200mA

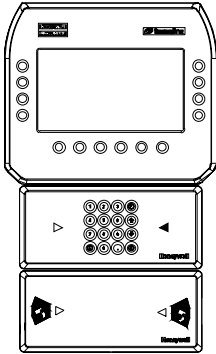
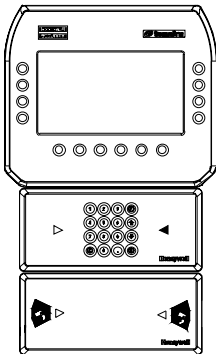
## Terminals with Keyboards

Code	Grouping	Horizontal	Vertical	Notes
<b>TK_D37</b>	1 x RTU-T01 1 x RTU-B07 2 x RTU-S01			Weight=0.85Kg Power=1.2W Current=90mA
<b>TK-T07</b>	1 x RTU-C01 1 x RTU-T01 1 x RTU-B07 1 x RTU-S03		NO	Weight=1.15Kg Power=3.1W Current=230mA
<b>TK_T012</b>	1 x RTU-C01 1 x RTU-T01 1 x RTU-B12 1 x RTU-S03		NO	Peso=1.0Kg Potenza=3.3W Corrente=260mA

## Interactive Terminals

Code	Grouping	Horizontal	Vertical	Notes
<b>TK-D27</b>	1 x RTU-C02 1 x RTU-B07 1 x RTU-S03		NO	Weight=1.25Kg Power=6W Current=440mA
<b>TK-D212</b>	1 x RTU-C02 1 x RTU-B12 1 x RTU-S03		NO	Weight=1.25Kg Power=6,2W Current=460mA

## Interactive Terminals with Keyboards

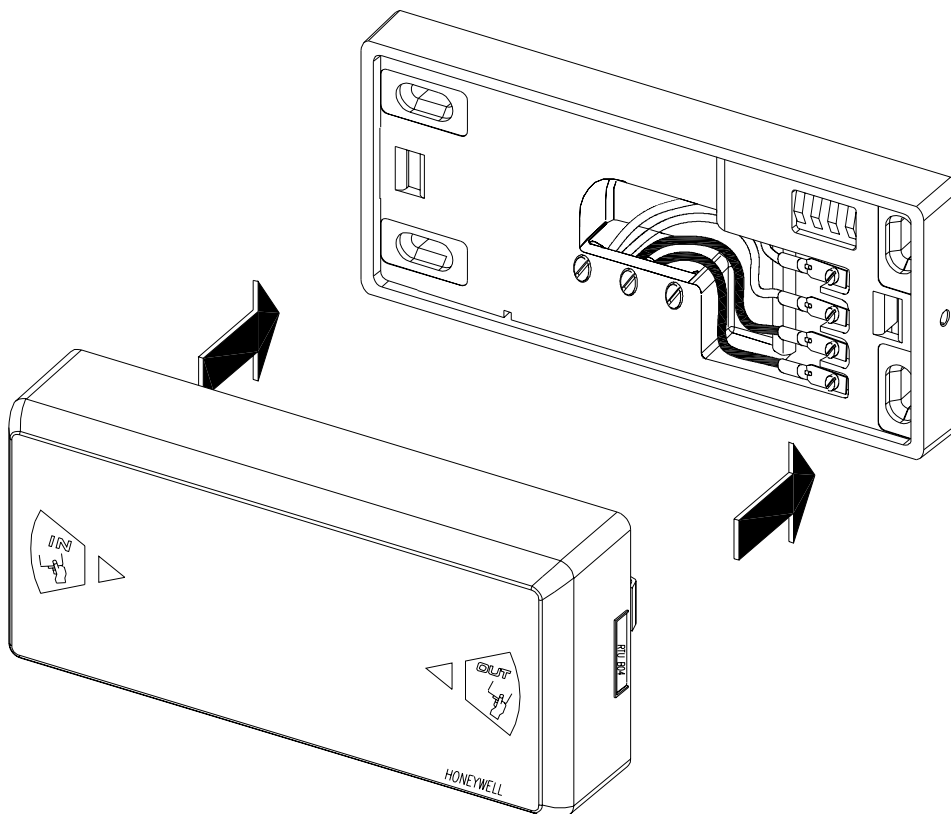
Code	Grouping	Horizontal	Vertical	Notes
<b>TK_T27</b>	1 x RTU-C02 1 x RTU-T01 1 x RTU-B07 1 x RTU-S03 1 x RTU-S01		NO	Weight=1.65Kg Power=6.4W Current=470mA
<b>TK_T212</b>	1 x RTU-C02 1 x RTU-T01 1 x RTU-B12 1 x RTU-S03 1 x RTU-S01		NO	Weight=1.65Kg Power=6.6W Current=490mA

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## Attaching the Modules to the Wall

All **tEmaline** modules are equipped with a simple attachment mechanism; the module clicks into position without the need for tools. To attach the module to the frame, follow these steps:

1. Check that the fitting at the back of the RTU modules is positioned correctly.
2. Attach each RTU module to the wall-mount frame as illustrated in Figure 11.

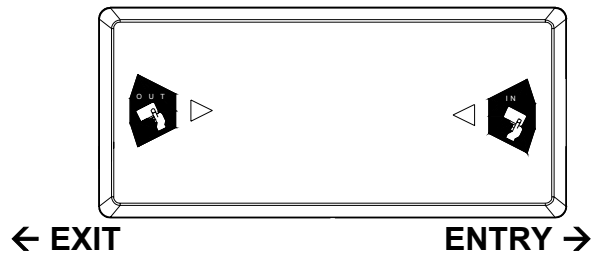


*Figure 11: Attaching the module to the wall-mount frame*

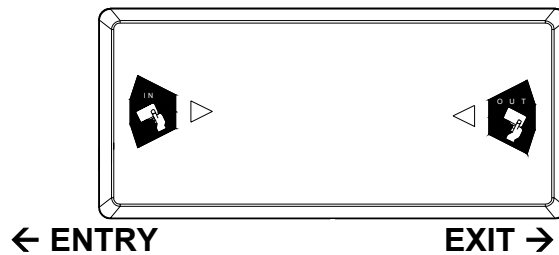
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## Applying the Entry/Exit Labels

Apply the two entry/exit labels to the magnetic reader according to the pre-configured transit direction. Make sure that you place the labels in the appropriate hollows (see details in Figure 12 and Figure 13).





*Figure 12: Entry/exit labels*



*Figure 13: Entry/exit labels*

## 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 3).

Description of location <i>Office entrance area, first floor - staircase E</i>	
Description of TemaServer <i>Panel 2 entrance area, first floor - staircase E</i>	
RTU  <i>C01</i>	<div style="border: 1px solid black; padding: 5px;">           PROG.ID= 4896873498696586  <small>(2/5 INTERLEAVED - DECIMAL)</small>    <b>255000255000255000</b> </div>
RTU  <i>T01</i>	<div style="border: 1px solid black; padding: 5px;">           PROG.ID= 34598763569634  <small>(2/5 INTERLEAVED - DECIMAL)</small>    <b>255001254002253003</b> </div>
RTU  <i>B07</i>	<div style="border: 1px solid black; padding: 5px;">           PROG.ID= 87607506970745  <small>(2/5 INTERLEAVED - DECIMAL)</small>    <b>001002003004005006</b> </div>
RTU  <i>-</i>	

*Table 3: Example of completed identification form*

# TECHNICAL DATA

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## Summary of Modular Devices




This section contains technical data regarding the modular devices:

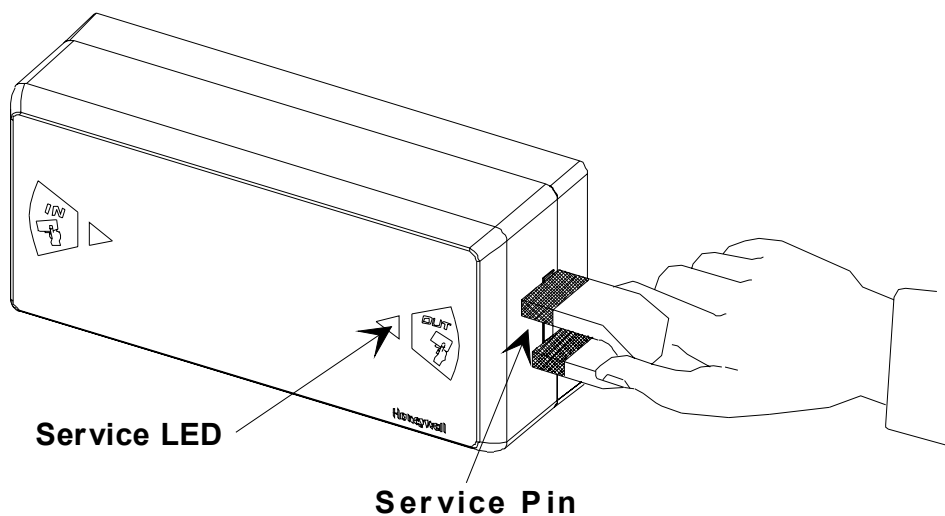
- RTU-B07 (Reader module for HID proxy cards)
- RTU-B12 (Reader module for Mifare proxy cards)
- RTU-C01 (Alphanumeric LCD module)
- RTU-C02 (Graphic LCD module)
- RTU-T01 (Numeric keyboard module)



# RTU-B07 (Proxy Reader for HID Cards)




Code 1520145

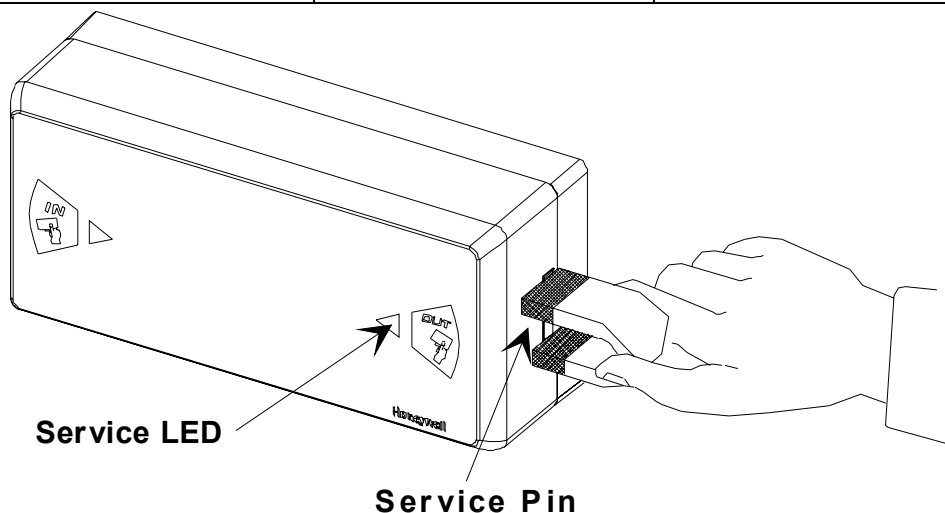
Parameter	Value
DC power supply	12V <sub>DC</sub> ±15% 60mA
Weight	0.30 Kg
Dimensions	72 x 160 x 52 mm
IP Protection Rating	IP55
Operating temperature	0-50 °C
Proxy receiver	For HID cards Double-antenna receiver (bidirectional)
LONWORKS® connection	Unshielded twisted pair cable (transceiver FTT10A, 78Kbps)
Signaling	2 LED tricolor (green/red/yellow) 1 buzzer
Regulations compliance	 Directive EMC 89/336/EEC, 92/31/EEC, Directive Low Voltage 72/23/EEC, 93/68/EEC: EN60950, EN55024, EN55022, EN 300 330
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>UL 60950 10D1</p> </div> <div style="text-align: center;">  <p>FCC ID: HS9-RTU-B07</p> </div> </div>



# RTU-B12 (Proxy Reader for MIFARE Cards)



Code 1500119

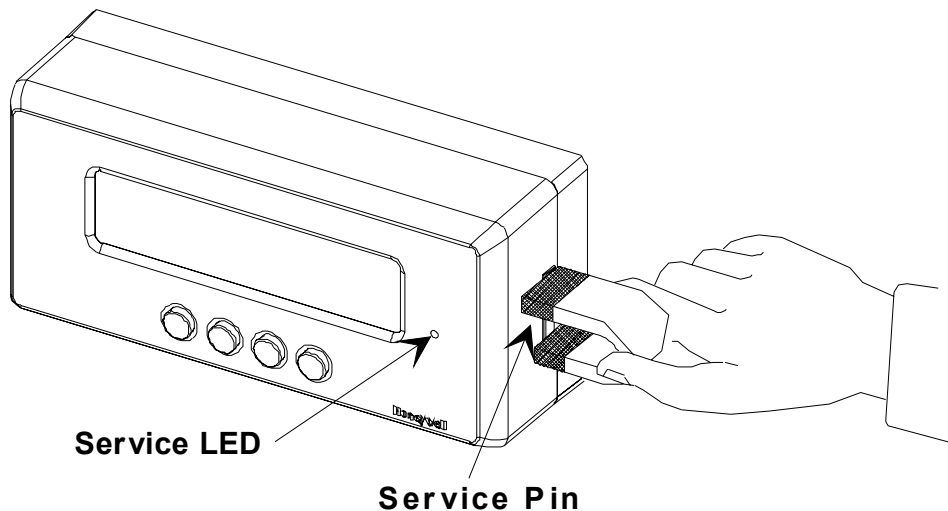
Parameter	Value
DC power supply	12V <sub>DC</sub> ±15% 90mA
Weight	0.30 Kg
Dimensions	72 x 160 x 52 mm
IP Protection Rating	IP55
Operating temperature	0-50 °C
Proxy receiver / Trasmitter	13.56MHz RX/TX for MIFARE (ISO14443-2A) cards
LONWORKS® connection	Unshielded twisted pair cable (transceiver FTT10A, 78Kbps
Signaling	2 LED tricolor (green/red/yellow) 1 buzzer
Regulations compliance	 Directive EMC 89/336/EEC, 92/31/EEC, Directive Low Voltage 72/23/EEC, 93/68/EEC: EN60950, EN55024, EN55022, EN 300 330
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>UL 60950 10D1</p> </div> <div style="text-align: center;">  <p>FCC ID: HS9-RTU-B12</p> </div> </div>



# RTU-CO 1 (Alphanumeric LCD Module)



Code 1500105

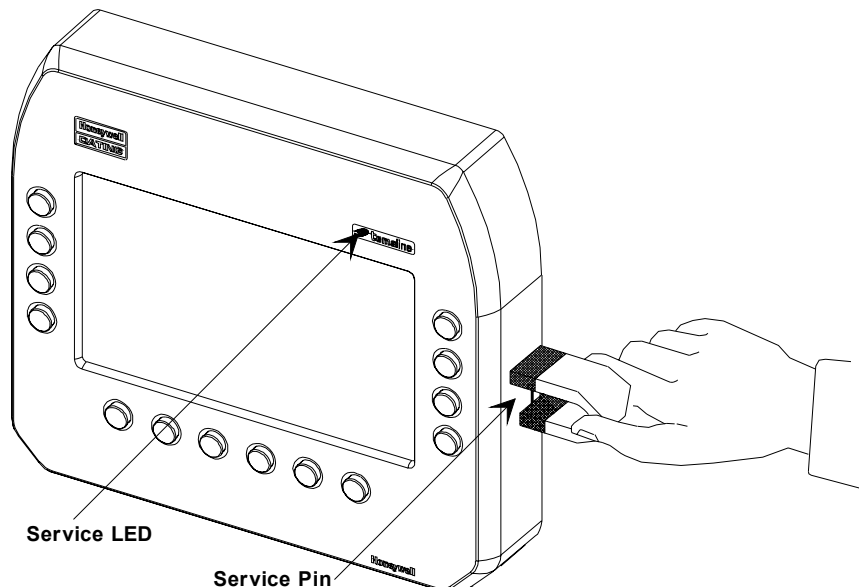
Parameter	Value
DC power supply	12V <sub>DC</sub> ±15% 140mA (nominal) 70mA (backlight off)
Weight	0.30 Kg
Dimensions	72 x 160 x 52 mm
IP Protection Rating	IP55
Operating temperature	0-50 °C
Display	Alphanumeric LCD with backlight 2 rows of 16 characters format
Keyboard	4 keys with symbols
LONWORKS® connection	Unshielded twisted pair cable (transceiver FTT10A, 78Kbps)
Signaling	1 LED yellow 1 buzzer
Regulations compliance	 Directive EMC 89/336/EEC, 92/31/EEC, Directive Low Voltage 72/23/EEC, 93/68/EEC: EN60950, EN55024, EN55022   <b>UL US LISTED</b> UL 60950 10D1



# RTU-C02 (Graphic LCD Module)



Code 1500101

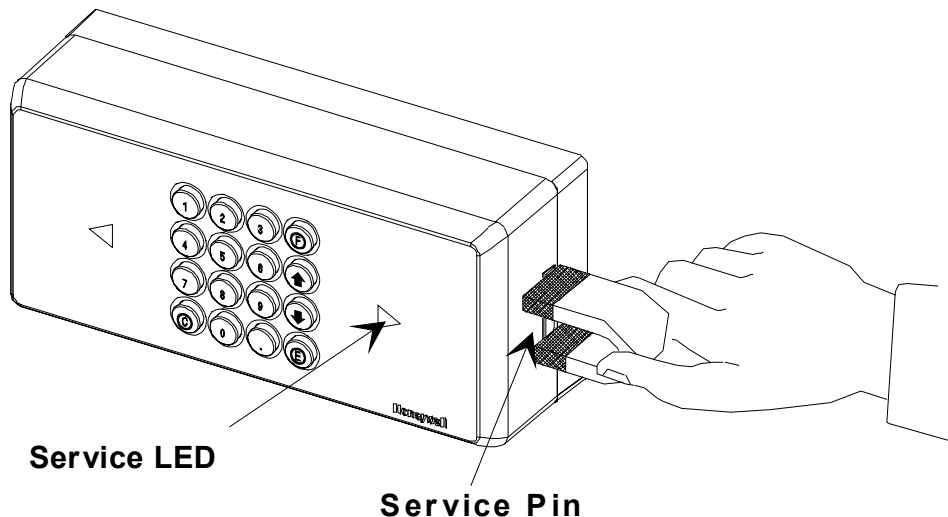
Parameter	Value
DC power supply	12V <sub>DC</sub> ±15% 380mA (nominal), 140mA (backlight off)
Weight	0.65 Kg
Dimensions	166 x 190 x 52 mm
IP Protection Rating	IP55
Operating temperature	0-50 °C
Display	Graphic LCD with backlight 240 x 128 pixels format
Keyboard	14 function keys
LONWORKS® connection	Unshielded twisted pair cable (transceiver FTT10A, 78Kbps)
Signaling	1 LED yellow 1 buzzer
Regulations compliance	 Directive EMC 89/336/EEC, 92/31/EEC, Directive Low Voltage 72/23/EEC, 93/68/EEC: EN60950, EN55024, EN55022
	 UL 60950 10D1



# RTU-T01 (Numeric Keyboard Module)

Code 1500104

Parameter	Value
DC power supply	12V <sub>DC</sub> ±15% 30mA (nominal), 50mA (max)
Weight	0.25 Kg
Dimensions	72 x 160 x 52 mm
IP Protection Rating	IP55
Operating temperature	0-50 °C
Keyboard	16 keys with symbols
LONWORKS® connection	Unshielded twisted pair cable (transceiver FTT10A, 78Kbps)
Signaling	2 LED bicolor (red/green/yellow) 1 buzzer
Regulations compliance	 Directive EMC 89/336/EEC, 92/31/EEC, Directive Low Voltage 72/23/EEC, 93/68/EEC: EN60950, EN55024, EN55022
	 UL 60950 10D1



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# Optional Parts

Unlocking tool	code 3900695AB
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