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# PRELIMINARY OPERATIONS

## Primary Power Isolation

A readily accessible disconnect device shall be incorporated in the building installation wiring to disconnect the equipment from the 115/230Vac supply for servicing.

## Voltage Supply Adjustment

CAUTION: 115/230$V_{AC}$ input voltage can be selected by switch. Check input voltage to avoid damage before power on.

See next figure for details regarding switch positions.

The factory setting of the voltage selection is 230Vac.

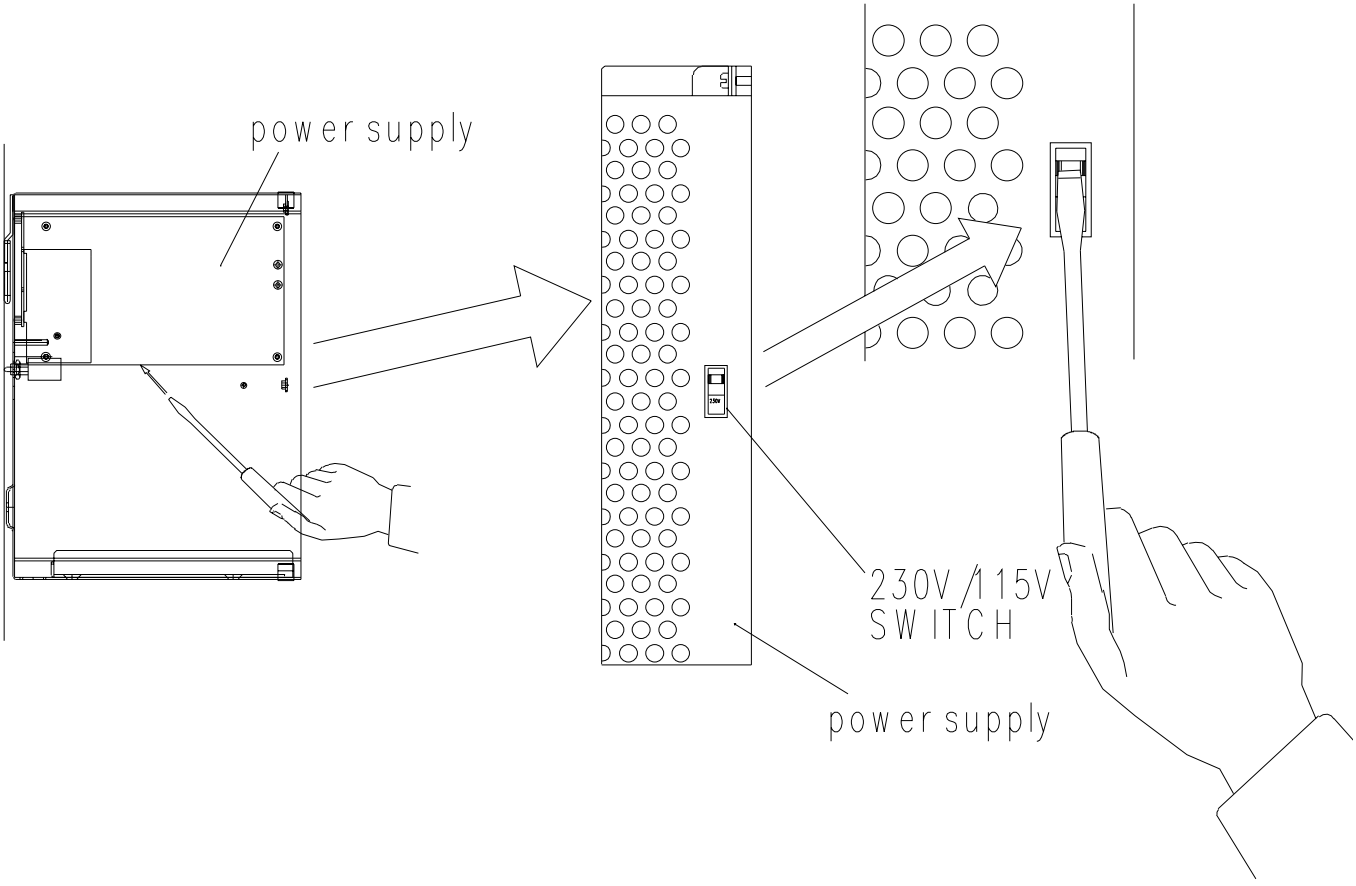


*Figure 1. Input voltage adjustment*

# Mounting Instructions

For mounting on a wall where a wall-box is installed with wires coming out of it.

1. Choose an area that satisfies the specified requirements for mounting and being able to open the unit (see Figure 2).
2. Leave sufficient space to the right and bottom of the unit to be able to access the box with a screwdriver.
3. Make holes in the wall using the drilling template.
4. Install the wall anchors.

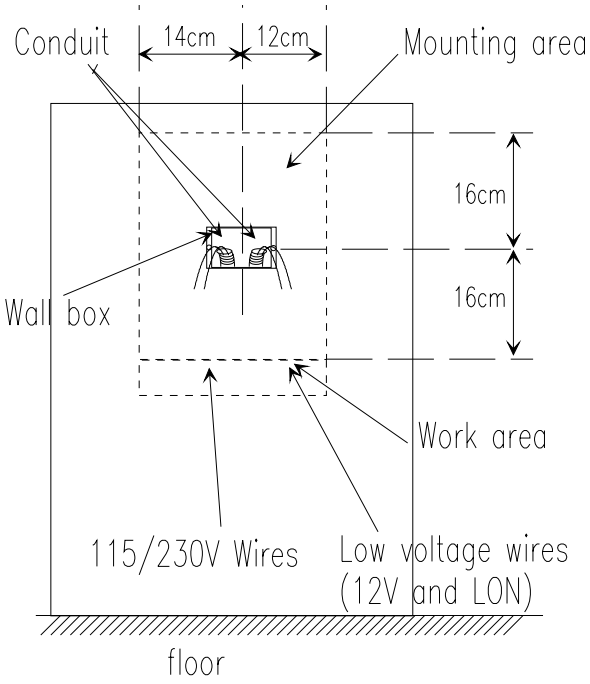


*Figure 2. Space Requirements for Mounting*

# Electrical Connections

Where a conduit is being used, it is necessary to lead two conduits to the RTU-Q03 to carry wires as follows:

- Conduit 1
  - 230V 50Hz 1.6A or 115V 60Hz 3.2A cable
- Conduit 2
  - 12VDC 5A (max) power cable
  - LONWORKS®[1] twisted-pair cable

The power supply provides the operating voltage for the Temaline System RTUxxx devices.

For connection of the RTUxxx devices, the size of the 12V wire must be calculated according to the following table (maximum voltage drop on the cable = 0.7V):

Cable length (m) = 0.7V / ((I[A] load x 2 x (res [Ohm/km] /1000))

| Concuctor size | | | Length of conductor (mt) based on load | | | | | |
|---|---|---|---|---|---|---|---|---|
| AWG | mm2 | Ohm/Km | 100 [mA] | 200 [mA] | 500 [mA] | 1 [A] | 2 [A] | 5 [A] |
| 10 | 5,25 | 3,41 | 1026 | 513 | 205 | 103 | 51 | 21 |
| 12 | 3,3 | 5,7 | 614 | 307 | 123 | 61 | 31 | 12 |
| 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 |

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

For the RTUA01s with 12V detectors connected, the size of the 12V cable can be calculated using the following table (maximum voltage drop on the cable = 0.5V):

Cable length(m) = 0.5V / (I[A] load x 2 x (res [Ohm/km] /1000))

| **Type of cable** | | | Length (m) in relation to base load | | | | | |
|---|---|---|---|---|---|---|---|---|
| AWG | mm2 | Ohm/Km | 100 [mA] | 200 [mA] | 500 [mA] | 1 [A] | 2 [A] | 5 [A] |
| 10 | 5,25 | 3,41 | 733 | 367 | 147 | 73 | 37 | 15 |
| 12 | 3,3 | 5,7 | 439 | 219 | 88 | 44 | 22 | 9 |
| 14 | 2 | 8,8 | 284 | 142 | 57 | 28 | 14 | 6 |
| 16 | 1,3 | 14 | 179 | 89 | 36 | 18 | 9 | 4 |
| 18 | 0,9 | 21 | 119 | 60 | 24 | 12 | 6 | 2 |
| 20 | 0,6 | 34 | 74 | 37 | 15 | 7 | 4 | 1 |
| 22 | 0,35 | 52 | 48 | 24 | 10 | 5 | 2 | 1 |

Normally, when a single power supply is operating, the voltage output uses the **J1** terminal block.

Power supplies can be placed in parallel. In this case the actual load to be used for sizing the conductors is the sum of all the loads placed in parallel.

If placed in parallel, the total power will be equal to the sum of the individual power supplies less 5%, and a **J2** terminal block with a dedicated output diode must be used for the voltage output.

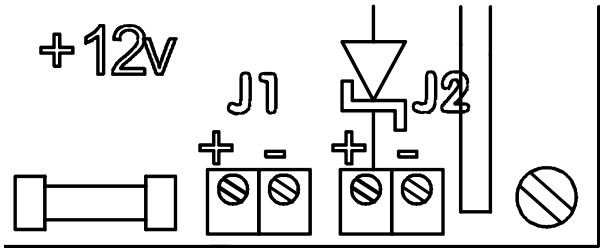


*Figure 3. V-Out Connections*

# LONWORKS® Data Cables

- Data cables used with LONWORKS®[2] must be twisted-pair.
- In a free-topology configuration, the total sum of the cable lengths must not exceed 500m.
- In a bus configuration, the total sum of the cable lengths must not exceed 2700m.
- In a free-topology configuration the 50-ohm termination is applied by inserting the jumper into the FTT10A plug-in board located in the CTU.
- In a bus configuration, two terminations (100-ohm resistors 1% ½W) are located at the two ends of the bus.
- Refer to Table 1 when sizing data cables to be used with LONWORKS®[2].

| Conductor Size | | | Length of conductor [m] based on its capacitance | | | | |
|---|---|---|---|---|---|---|---|
| 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/Capacitance of Cables to be Used with LONWORKS®*

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

- The suggested cables in the FTT10A Echelon® v1.2 User Guide are indicated in Table 2.

| Mfg description and part number | AWG | Bus connection - Max. total length [m] | Free topology connection - Max. node to node length [m] |
|---|---|---|---|
| Belden 85102 | 16 | 2700 | 500 |
| Belden 8471 | 16 | 2700 | 400 |
| Level IV (twisted pair, solid, non-shielded) | 22 | 1400 | 400 |
| JY (St) 2x2x0.8 (4-wire helical twist, solid, shielded) | 20 | 900 | 320 |

*Table 2. Cables Suggested for Use with LONWORKS®*

# INSTALLATION

## Wall Mounting

1. Attach the wall-mount frame to the wall using 2 anchors (see Figure 4).
2. Hook the power supply on to the wall (see Figure 5 ).
3. Separate the 115/230V wires. (Use a voltage tester first to make sure the power is off.)
4. Unscrew the two TORX STX/T10 tamper-resistant screws and open the power-supply cover.
5. While holding the power supply, feed all the cables coming from the wall box into the back of the unit.
6. Hook the power-supply box to the wall-mount frame and screw in the fastening screws (see Figure 5).
7. Select the correct voltage (230V/115V) on the power supply (see Figure 1); the factory setting of the voltage selection is 230Vac.

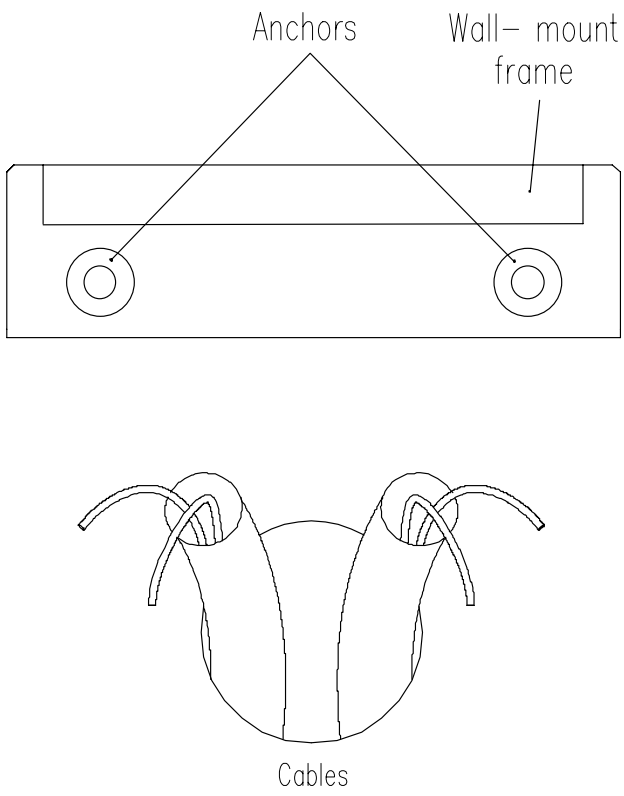


*Figure 4. Attaching the Wall-Mount Frame*

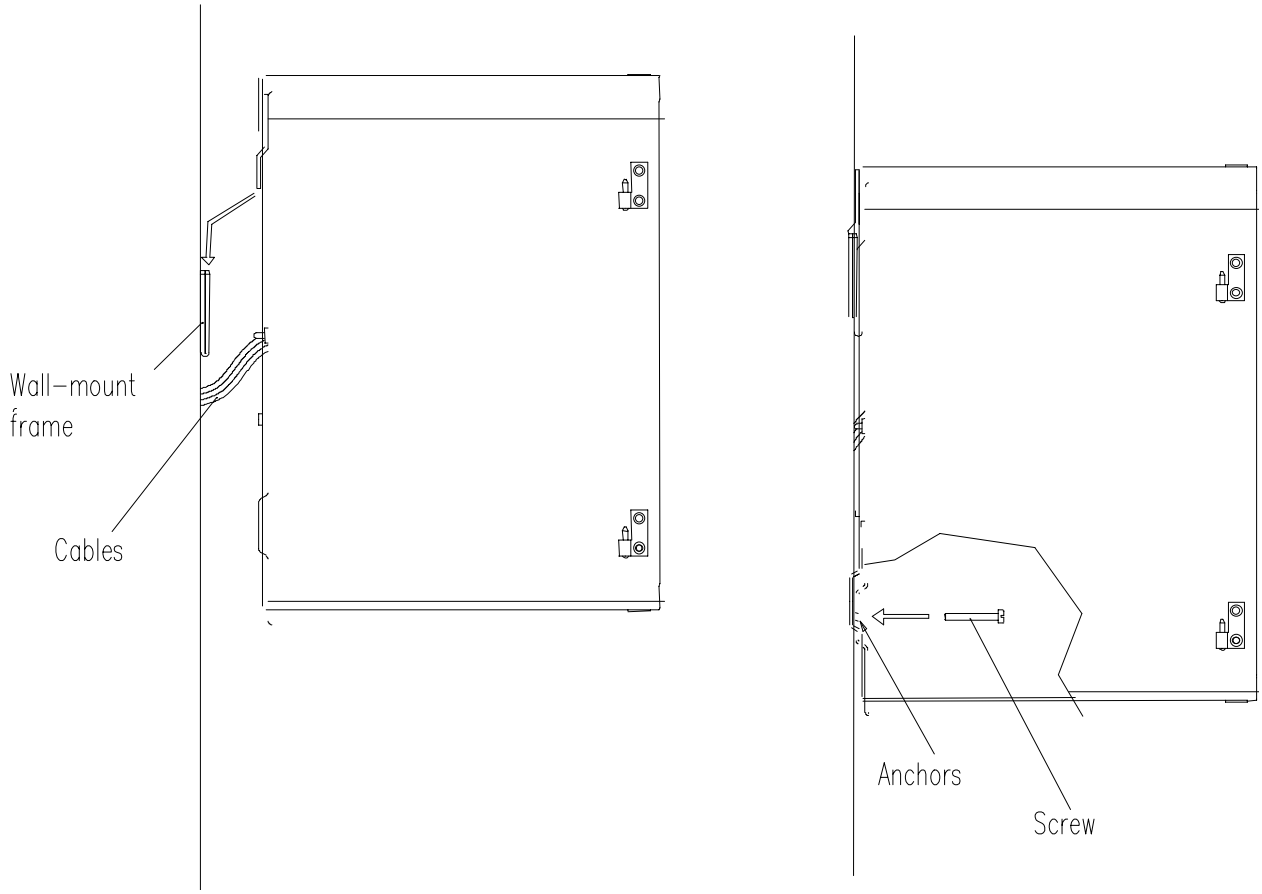


*Figure 5. Hooking on to the Wall-Mount Frame*

# Cable Arrangement

To arrange the cables, follow these steps (see Figure 6):

1. If the cables come from the cable conduit, place the cables on the tie wrap bases and tighten the tie wraps.
2. If the cables come directly from the wall, go to the “Cable Connections” section and follow procedures there.

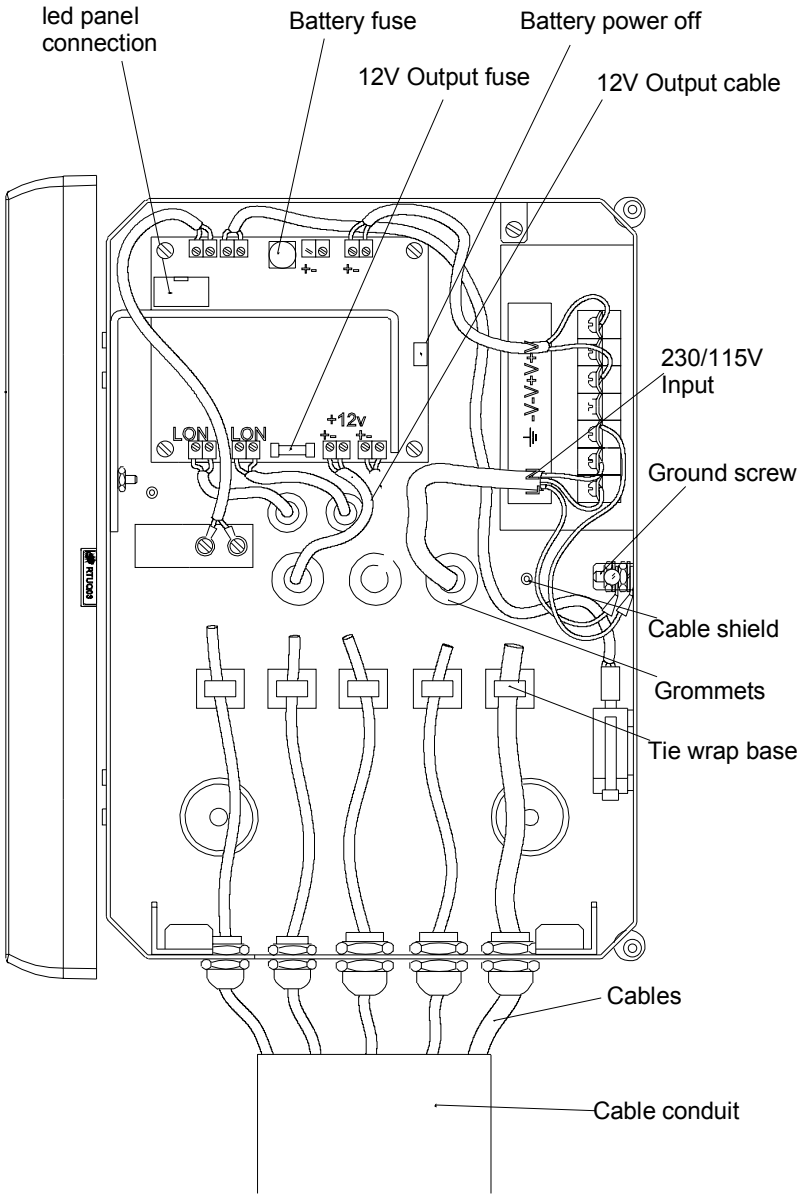


*Figure 6. Cable Arrangement*

**NOTE**

- The twisted-pair LONWORKS® cable is not polarized.

# Cable Connections

To connect the cables follow these steps:

1. Make sure that there is no power on the 115/230V cable.
2. Terminate and tighten the ground cables (see Figure 7).
3. Terminate and tighten the 115/230V cable (see Figure 7).
4. Terminate and tighten the 12V cable (see Figure 8).
5. Terminate and tighten the LONWORKS twisted-pair cable. Up to two cables can be connected.
6. Place battery in battery compartment.
7. Connect cables to battery terminals. Be sure to observe proper polarity (red=+, black=-).

**CAUTION:**

**Risk of explosion if the battery is replaced with an incorrect type.**

**Batteries should be recycled when possible.**

**Disposal of used batteries must be in accordance with local environmental regulations.**

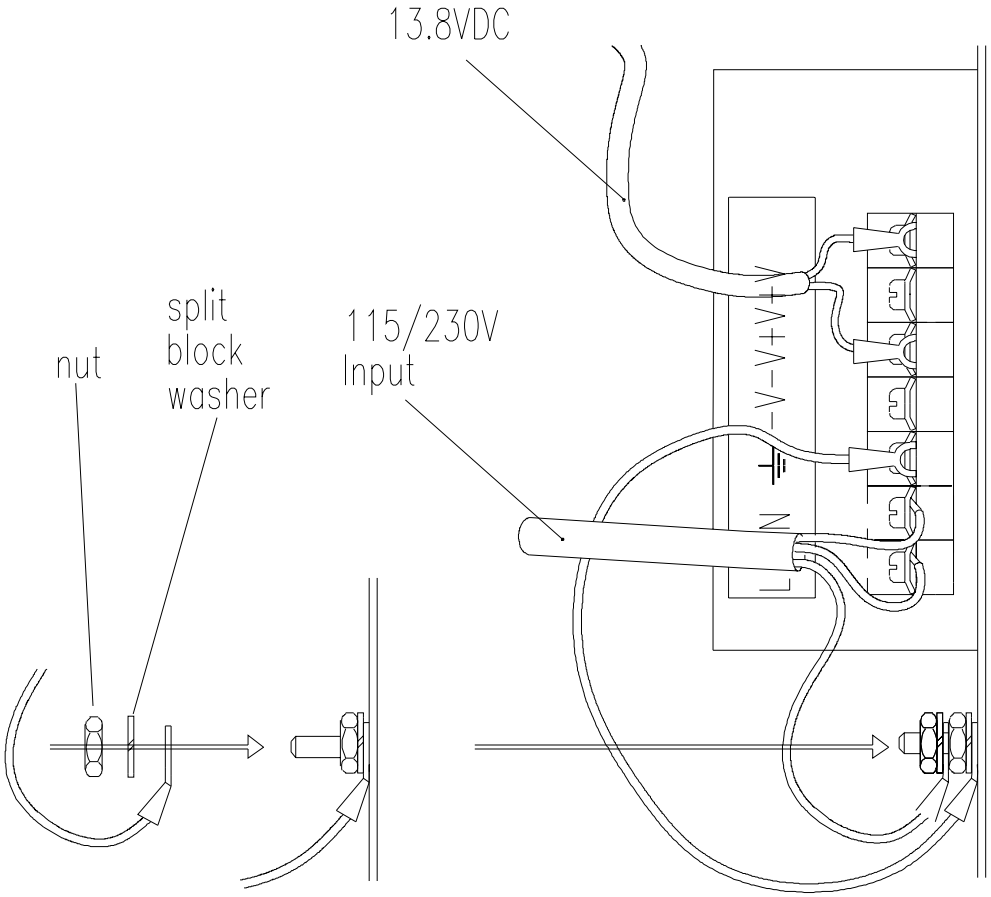


*Figure 7. Grounding*

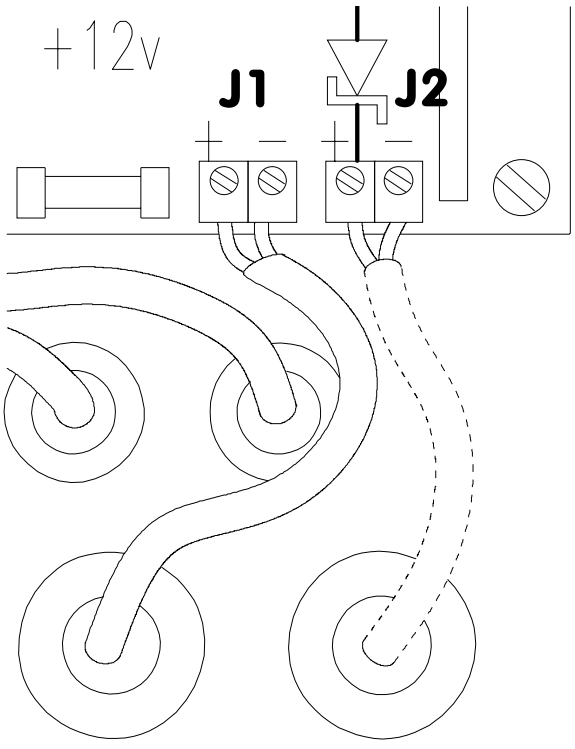


*Figure 8. Tightening the 12V Cable*

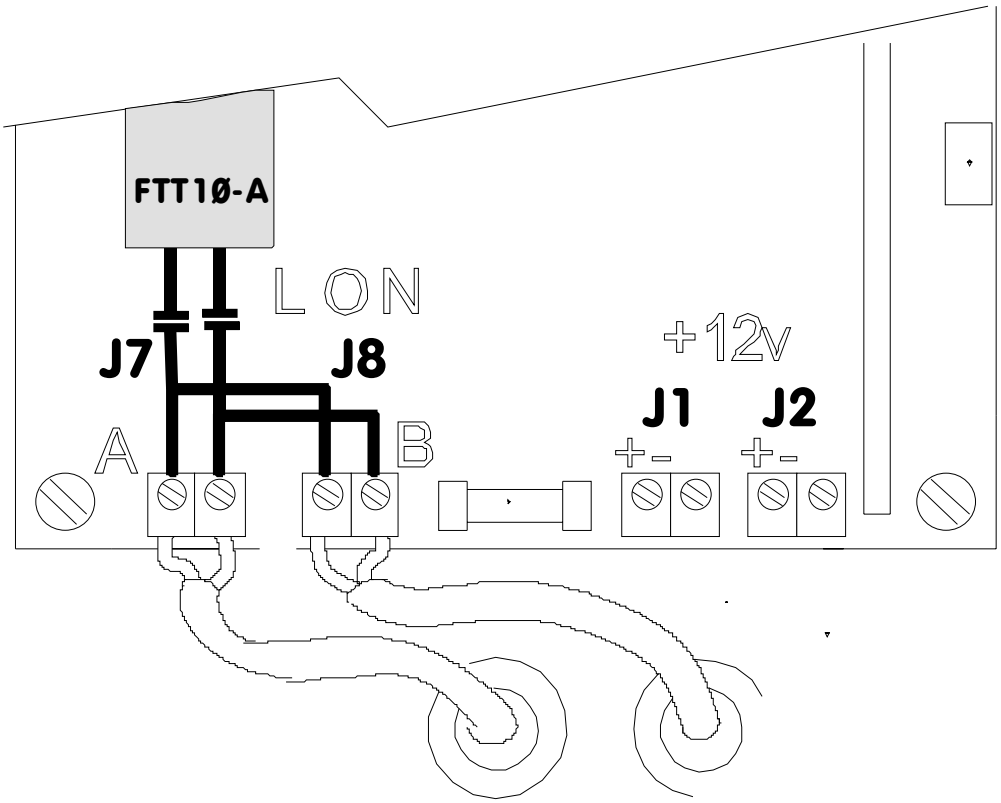


*Figure 9. Tightening the LON Cables*

# Elemental Details

Figure 8 indicates details of the electronic boards, including the location of the main connectors, fuses, and jumpers.

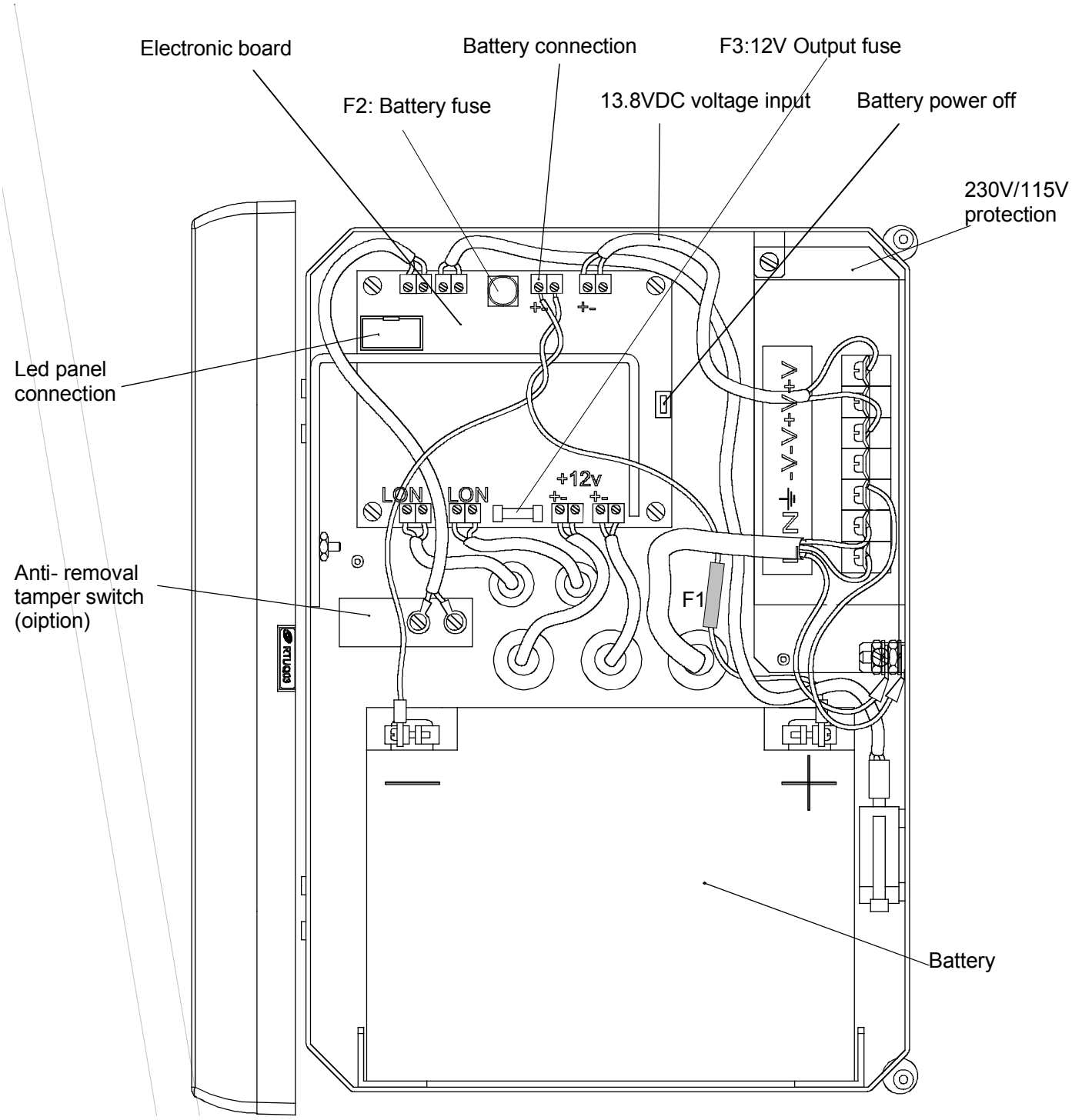


*Figure 10. Elemental Detail (front view)*

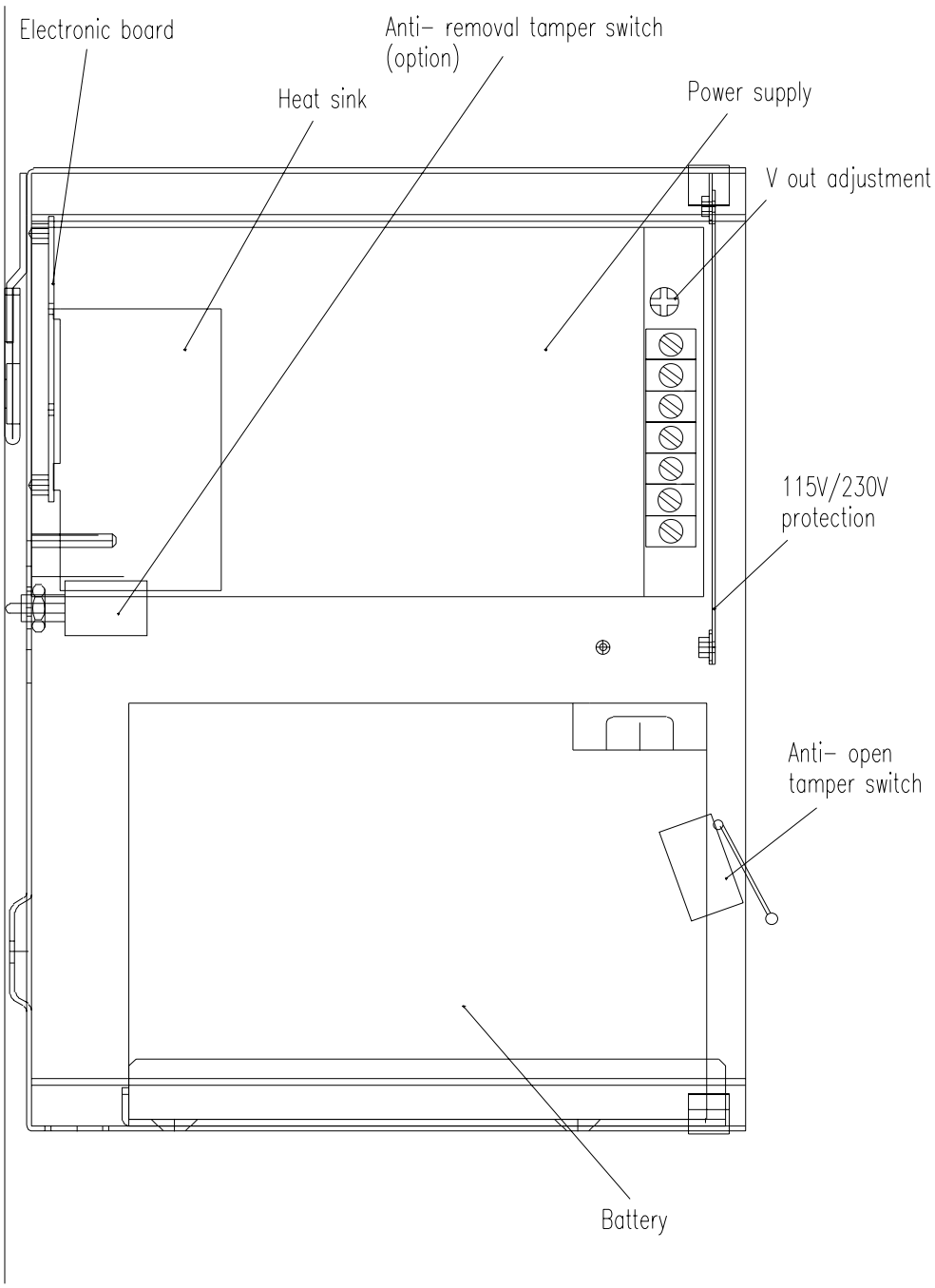


*Figure 11. Elemental Detail (side view)*

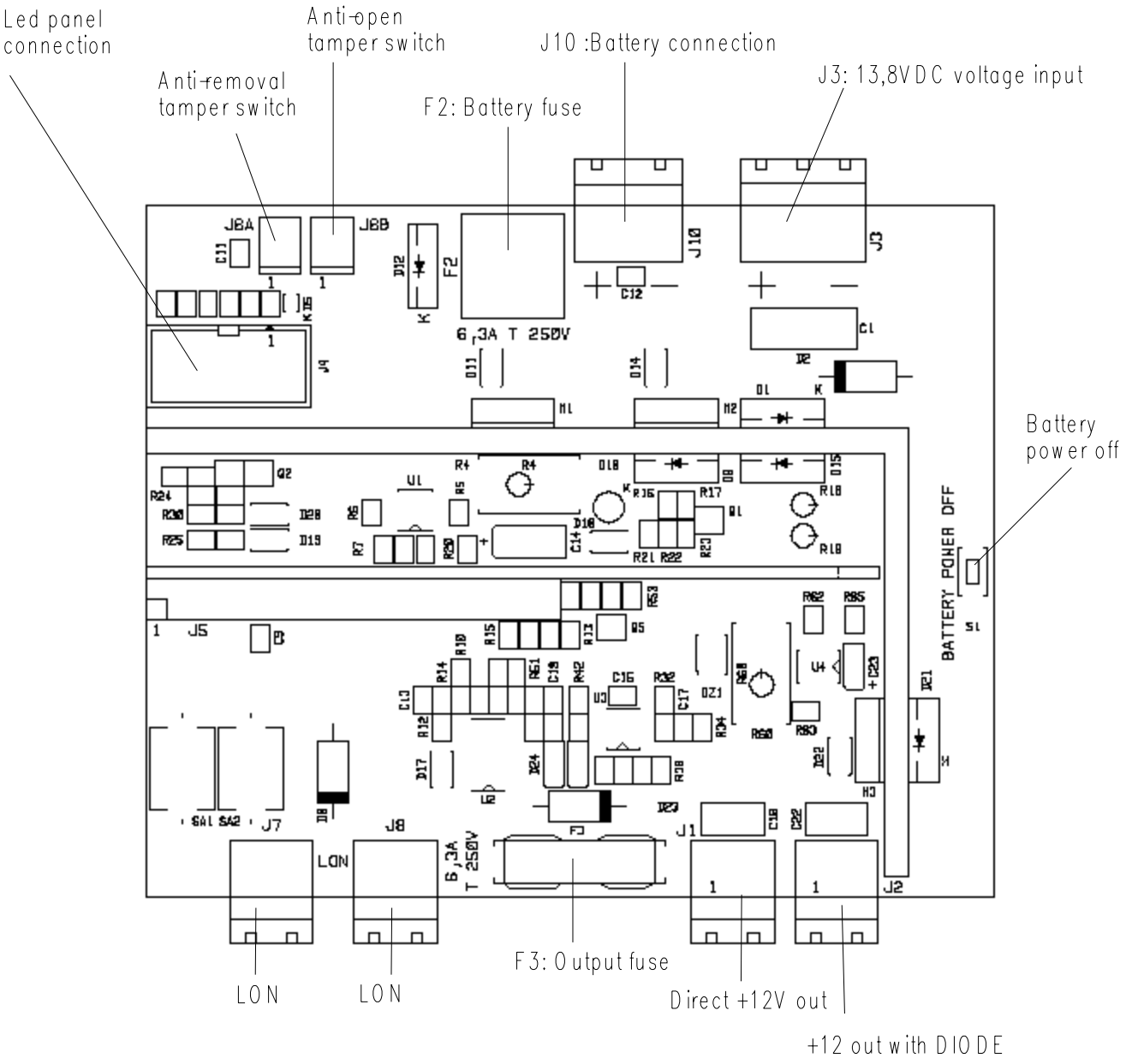


*Figure 12. Elemental Detail (electronic board)*

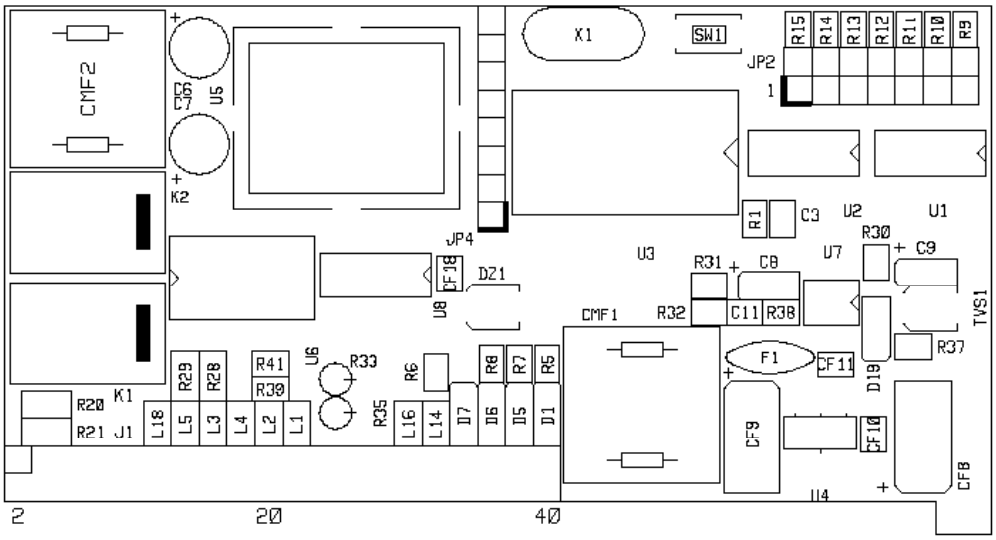


*Figure 13. Elemental Detail (vertical electronic board)*

# Turning On the Power Supply

To turn on the power supply follow these steps:

1. Place the external disconnect device switch in the «**ON**» position and leave the battery cable that goes to the J10 terminal disconnected. The unit should now be on.
2. Manually close the tamper switch.
3. Wait 2 to 3 seconds. If the red LED goes on, it means that there is an overload or a short circuit on the output (or that the internal tamper switch is not closed). Check the wiring and eliminate the problem (see following paragraph).

   If the green LED is on it means the unit is operating normally.
4. Connect the battery cable to the J10 terminal.
5. Close the cover.

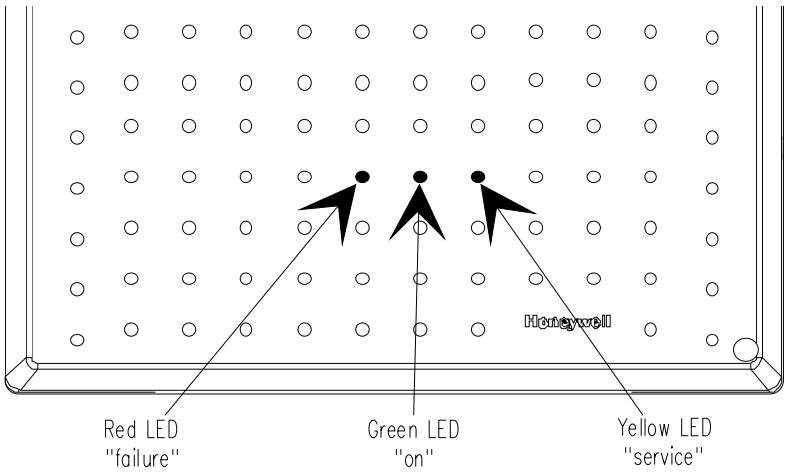


*Figure 14. LED Detail*

# Using LEDs for Problem Tracking

## Red LED:

OFF: Normal status

Steady ON — possible causes:

1) Tamper alarm for open door

   - Close the device and verify that it is OFF

2) Short circuit alarm or output voltage < 8VDC

   - Short circuit; disconnect the output load and verify that the LED goes off => check for a short circuit.

   - Output voltage low; disconnect the output load and verify the voltage on the output terminals;

     - If the F3 output fuse is still whole and the voltage is >12V when the LED is off, then it probably means that a load greater than 5A was inserted; in this case the power supply will go into protection and deactivate the output.

   - Remove a portion of the load and verify that the LED goes off.

     - If the F3 output fuse is still whole and the voltage is <10.5V, then the input voltage at J3 must be checked (see Figure 12):

       1. If the voltage is <13.8V then this needs to be regulated using the trimmer positioned on the power supply, as seen in Figure 11. After disconnecting the battery and the load, the voltage at the J3 terminal must be regulated to 14V. If it is not possible to regulate to 14V, the power supply is faulty and must be replaced.

     - If the output fuse F3 is broken, you need to check:

       1. That a reverse voltage was not inserted with the connection cable;

       2. That on the cable (without reconnecting it to the power supply) there is no voltage > 18V (protection intervention voltage).

3) Battery charge voltage alarm < 10.5VDC

- Disconnect the battery and use a tester to check the voltage on the J10 terminal (see Figure 12);

  - If the F2 fuse is still whole and the voltage is less than 13.5V, then it is necessary to check the input voltage at J3:

    1. If the voltage is < 13.8V, this needs to be regulated using the trimmer positioned on the power supply, as seen in Figure 11. After disconnecting the battery and the load, the voltage at the J3 terminal must be regulated to 14V. If it is not possible to regulate to 14V, the power supply is faulty and must be replaced.

  - If the F3 output fuse is broken, then you must check that:

    1. The battery was installed with the correct polarity.

    2. If the fuse is replaced (after disconnecting the battery) and it stops immediately, then the power supply is faulty and must be replaced.

4) Battery disconnected, series F1 fuse interrupted, or inefficient battery:

Every 10 minutes, the power supply runs a test for battery connection and efficiency. The red LED will light up: if the battery is disconnected; or if the fuse in series with the red conductor near the positive pole of the battery was interrupted because of an accidental short circuit during installation; or if the load voltage is less than 10V.

Note: this test is performed 10 minutes after startup.

- If the battery is disconnected, it must be reconnected, and after 10 minutes the red LED must go out.

Attention: when first turned on, you may find that the battery connected is undercharged (with voltage less than 10V) because of long warehouse storage, though it may still be possible to recharge it. If this is the case, wait for the battery to recharge (which causes the red LED to go off). If the battery does not recharge even partially after about 4 hours, the battery must be replaced.

- If the battery is inefficient, it must be checked by disconnecting it from the power supply: insert a resistance load of 22 Ohm 5% 7W (about 0.5A load) between the two poles; if the voltage is less than 9V, the battery is inefficient and must be replaced.

Note: this test is not to be performed on first startup, because the battery might simply be undercharged due to its time in the warehouse

Note: average battery lifespan = 3 yrs at 25º room temperature; increasing the temperature decreases the average lifespan (35º = 2 yrs).

Blinking 1sec on / 3 sec off:

Current alarm > 4.5A < 5A

- Insert an amperometer in series with the load and check that the current is <= 4.5A

Note: over 5A of load, the output voltage gets disconnected, and the red LED signal goes steady ON for low output voltage. Once the load returns within limits, the reset is automatic.

### Green LED:

Off: no meaning - power supply faulty

Steady On: network voltage 230Vac / 115Vac present

Blinking: network voltage 230Vac / 115Vac not present — operating on battery

### Yellow LED: [LonWorks Service LED]

Off: normal status

Steady On: Neuron Chip without application and not configured

Blinking 0.5Hz: Neuron Chip in application status present, but not configured

Note: the LED also goes on to indicate the activation with magnet of the service PIN (see page 24)

# Switching Off the Power Supply

To switch off the power supply, follow these steps (see Figure 15):

1. Make sure the gasket is properly placed and close the cover.
2. Lastly, screw the cover closed using the two TORX STX/T10 tamper-resistant screws (requires TORX Tamper-Resistant TX10 screwdriver).
3. When the cover is closed, the internal tamper switch is turned off and the red LED goes out.

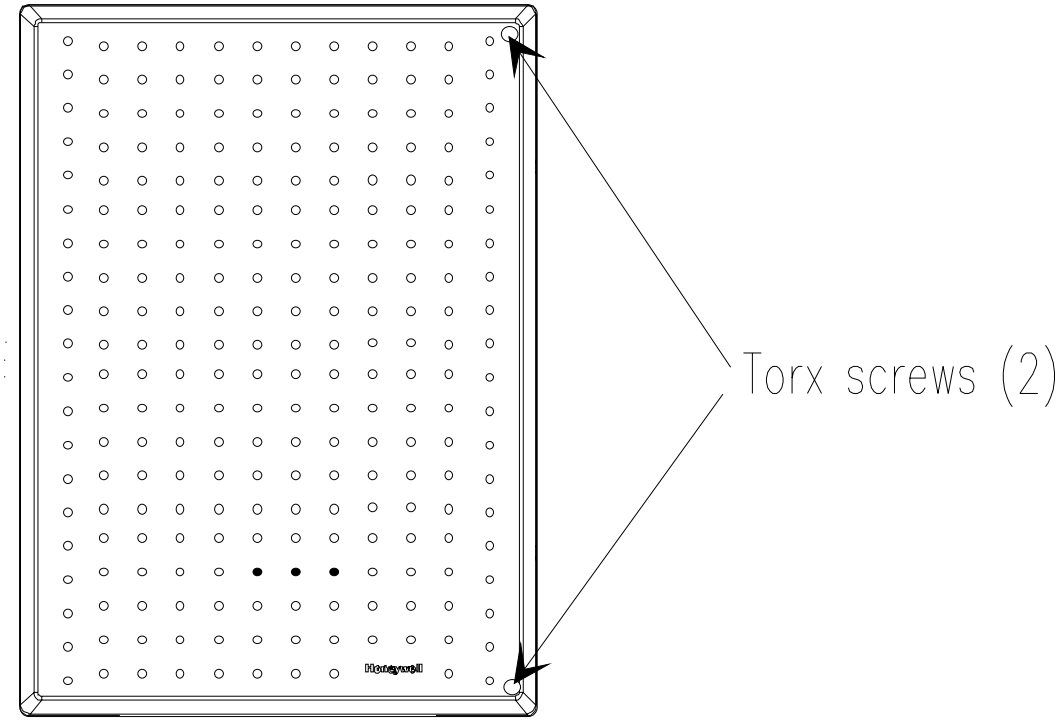


*Figure 15. Switching Off the Power Supply*

# Switching Off Power Supply (Maintenance)

To switch off the unit, follow these steps:

1. Place the external disconnect device switch in the «**OFF**» position.
2. Open the unit by unscrewing the two screws on the front cover (requires TORX Tamper-Resistant TX10 screwdriver).
3. Hold down the ‘Battery Off’ button for 2 seconds (see Figure 12).
4. Verify that the green LED on the front cover is off (if not, repeat step 3). The unit should now be off.

# Technical Specifications

## 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.

## 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.

## TemaPower TP U03 (RTU-Q03 code 1500080xx )

| Parameter | Value |
|---|---|
| **Power supply** | 220-240 $V_{AC}$ 50Hz 1.6A<br>or<br>110-120 $V_{AC}$ 60Hz 3.2A |
| **Weight** | 8.5 kg + 9kg battery |
| **Dimensions** | 221x305x233 mm |
| **IP Protection Rating** | IP31 |
| **Maximum rated operating temperature** | 0...40°C |
| **Operational humidity** | 0 ÷ 85% relative, no condensation |
| **Storage temperature** | -20°C ÷ 40°C |
| **Storage humidity** | 0 ÷ 70% relative, no condensation |
| **LONWORKS®[3] connection** | "Free-topology" connection with twisted-pair non-shielded cable |
| **Outputs** | Voltage 12.0$V_{DC}$±15% |

[3] LONWORKS® is a registered trademark of Echelon Corporation

| | |
|---|---|
| | Current 0...4.5A (nominal)<br>5A (max) |
| **Battery recharge time** | 80% of capacity in 4 hours |
| **Battery autonomy** | 4 hours with 4.5A load |
| **Conformance to regulation** | CE EMC Directives 89/336/EEC, 92/31/EEC,<br>Low Voltage Directives 72/23/EEC, 93/68/EEC:<br>EN60950, EN55024, EN55022, EN61000-3-2/3 |
| | FC **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.** |
| | c UL us LISTED<br>UL60950<br>E197303<br>Honeywell International Inc<br>Model: RTU-Q03<br>Manufacturer:<br>Meg Italia S.R.L.<br>Input:<br>110-120/220-240 V<br>60Hz or 50Hz<br>3.2 A/1.6 A<br>OUTPUT:<br>12 V d.c.<br>4.5 A |

## Spare parts

| | |
|---|---|
| **Fuses** | F1: 10 AT UT632310 32V 6,3x32 UL<br>(soldered onto the "+" of the battery cable)<br>F2 : 6.3AT 250V delayed<br>F3 : 6.3AT 250V delayed |
| **Battery** | 12V 27Ah code 1801182<br>**Note: avg. battery lifespan = 3 yrs at 25º room temp.; with temperature increase avg life decreases (35º = 2 yrs)** |

## Optional parts

| | |
|---|---|
| **TORX TX10 screwdriver** | Code 1500108AA |

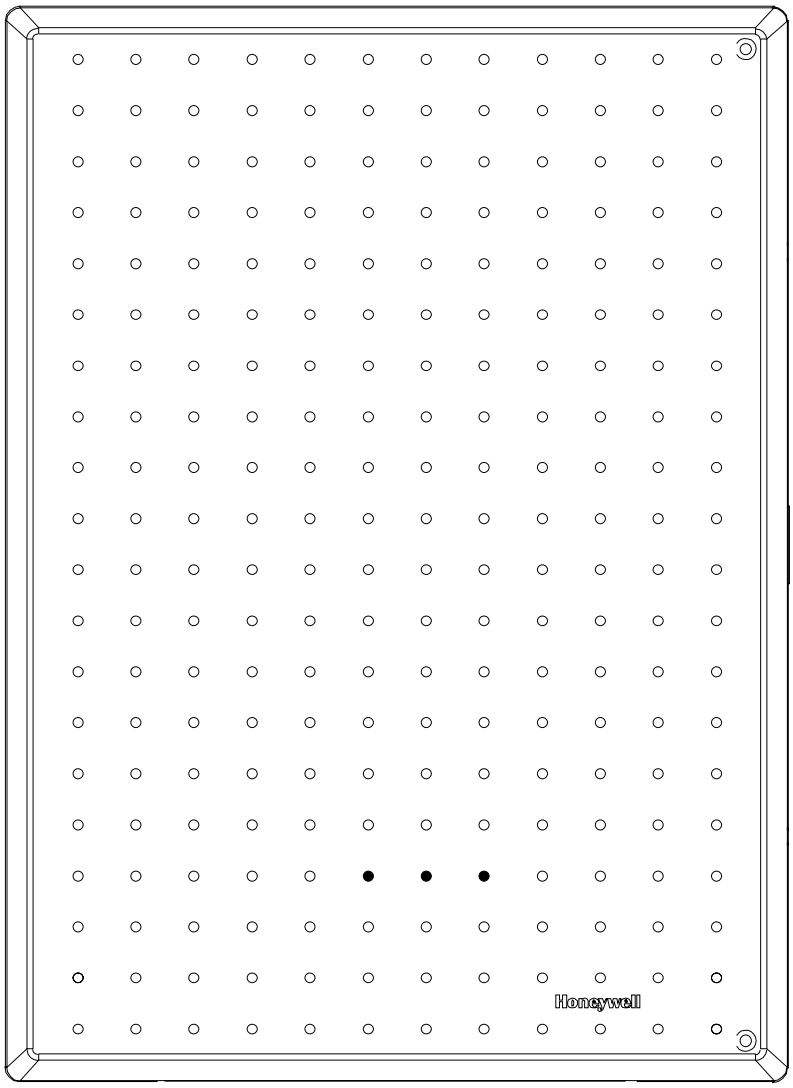


*Figure 16. TemaPower TP U03*

# ACTIVATION

## Identification via the Service Pin

To identify the node, you can activate the service pin by means of the Reed-relay located within the unit (see Figure 17). To do this, follow these steps:

1. To activate the service pin place a small magnet near the front cover, as illustrated in Figure 17. Doing so causes the yellow service LED (to the right) to light up.
2. In response to the service pin, the TemaServer sends a *wink* command that makes the red LED blink for 2 seconds. This verifies that communication with the TemaServer has been established.
3. Check that the yellow LED is off upon completion of procedure.

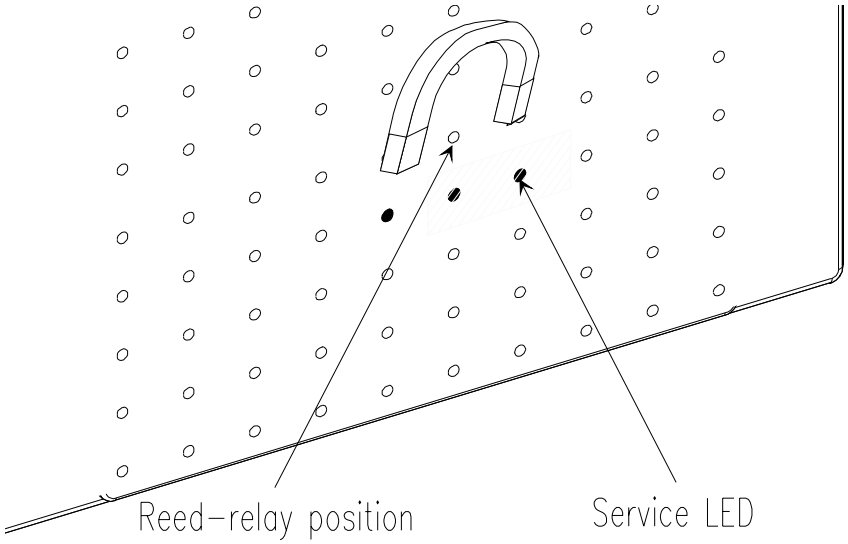


*Figure 17. Activation of Service Pin with Magnet*

# Bar Code Identification

The bar code label enclosed in the box must be applied to the identification form by the installer. Terminal location must be indicated in appropriate box (see example in Table 3).

| | |
|---|---|
| Location description<br>*Office entrance, first floor staircase E* | |
| TemaServer description<br>*Panel 2 first floor entrances staircase E* | |
| **TPU03** | PROG.ID= 4896873498696586<br>(2/5 INTERLEAVED - DECIMAL)<br>  <br>25500025500025500O |
| | |
| | |
| | |

*Table 3. Example of Completed Identification Form*