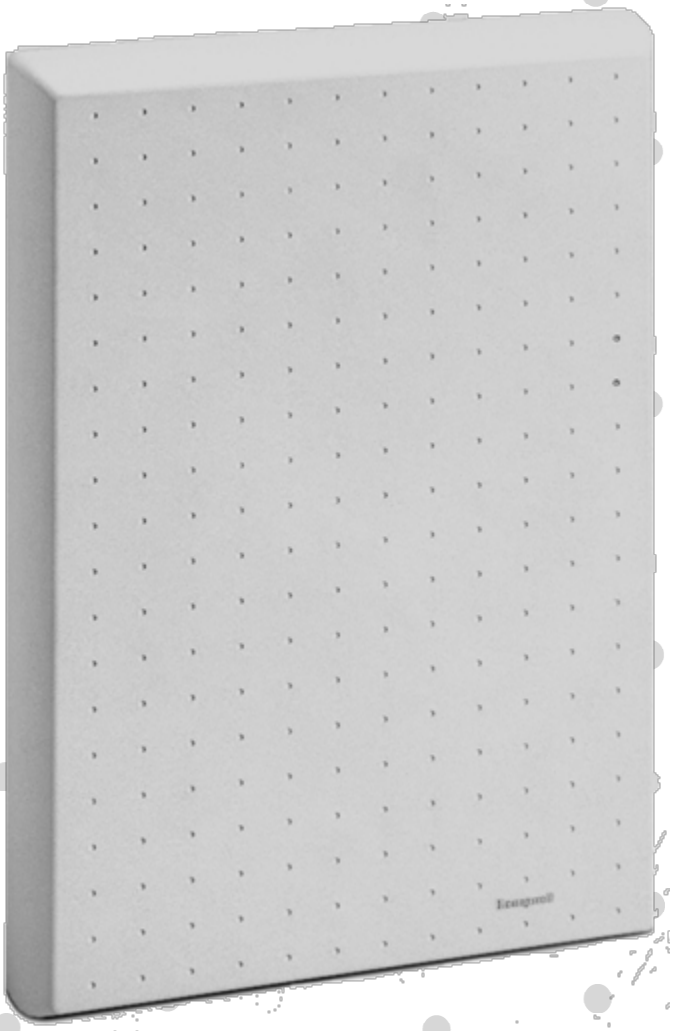
Honeywell

Temaline
TS2 (TemaServer 2)



Installation Manual

Honeywell

Document	Release	Issue	Date
800-22710	2.2	H	November 2017

Notice

Trademarks

Compliance

To obtain applicable EU compliance Declaration of Conformities for this product, please refer to our website, https://extranet.honeywell.com. For any additional information regarding the compliance of this product to any EU-specific requirements, please send email to temaline.orders@honeywell.com

Single contact point and Support

Manufacturer's single point of contact:

Honeywell S.r.l.
Via Philips, 12
20052 Monza
ITALY

For technical assistance, call your nearest Honeywell office.

TABLE OF CONTENTS

Warnings and Cautions

Before installation

Warning: Before installation, **TURN OFF** the external circuit breaker which supplies power to the device.
Before connecting the device to the power supply, verify that the output voltage is within specifications of the power supply. (See “Technical specifications” on page 37.)
Do not apply power to the device until **after** the installation has been completed.
The equipment can be damaged if this precaution is not observed.

Fire Safety and Liability Notice

Warning: Never connect card readers to any critical entry, exit door, barrier, elevator or gate without providing **an alternative exit** in accordance with all the fire and life safety codes pertinent to the installation.
These fire and safety codes vary from city to city and you must get approval from local fire officials whenever using an electronic product to control a door or other barrier. Use of egress buttons, for example, may be illegal in some cities. In most applications, single action exit without prior knowledge of what to do is a life safety requirement. Always make certain that any required approvals are obtained in writing. DO NOT ACCEPT VERBAL APPROVALS SINCE THEY ARE NOT VALID.

Damage during shipment

Caution: IF ANY DAMAGE TO THE SHIPMENT IS NOTICED, A CLAIM MUST BE FILED WITH THE COMMERCIAL CARRIER RESPONSIBLE FOR THE DAMAGE.

Electrostatic discharge

Caution: Electrostatic discharge (ESD) can damage integrated circuits and modules. To prevent damage always follow these procedures:
Use static shield packaging and containers to transport all electronic components, including completed reader assemblies.
Handle all ESD sensitive components at an approved static controlled workstation. These workstations consist of a desk mat, floor mat and an ESD wrist strap. Workstations are available from various vendors.

Note: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the installation and user guides, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Disclaimer – Product Liability; Mutual Indemnification

If a Customer receives a claim that a Product or any component thereof has caused personal injury or damage to the property of others, Customer shall immediately notify Honeywell S.r.l. Italy in writing of all such claims. Honeywell S.r.l. Italy shall

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Compliance

For any additional information regarding the compliance of this product to any EU-specific requirements, please send an e-mail to temaline.orders@honeywell.com.

Unpacking

Caution: If any damage to the shipment is noticed before unpacking, a claim must be filed with the commercial carrier.
All containers should be opened and unpacked carefully in order to prevent damage to the contents.
Follow these steps to unpack equipment in preparation for installation:
Open the container and remove the unit(s) and all packing material. Retain the container and all the packing materials. They may be used again for reshipment of the equipment, if needed.
Inspect the contents to see if anything is missing. If you notice any missing items, send an e-mail to temaline.orders@honeywell.com.
Visually check the contents. If you see any damage, do the following:
If shipping has caused damage to the unit, file a claim with the commercial carrier.
If any other defect is apparent, call for a return authorization.

Shipping instructions

To ship equipment back to Temaline, contact the customer service department at temaline.orders@honeywell.com before returning the equipment. When you call, please have available:
A description of the problem or the reason you are returning the equipment.
Your original purchase order number, invoice number and if the unit is still under warranty.
A new purchase order number if the unit is not under warranty.

From the customer service department, obtain the **Return MerchandiseAuthorization (RMA)**.
Show the RMA number on all packages shipped. Packages which are not marked with an RMA number will be refused at the factory and returned to you **COD.**
Carefully pack the equipment for shipment. Use the original packing material whenever possible

Limited warranty

All warranty work shall be handled through Customer who shall notify Temaline and apply for a Return Merchandise Authorization (RMA) number prior to returning any

Product for service, repair, credit or exchange. Temaline warrants that its Products shall be free from defects in materials and workmanship for a period of 18 months from the date of shipment from the Temaline warehouse. Satisfaction of this warranty shall be limited to repair or replacement of Products which are defective or defective under normal use. Temaline's warranty shall not extend to any Product which, upon examination, is determined to be defective as a result of misuse, improper storage, incorrect installation, operation or maintenance, alteration, modification, accident or unusual deterioration of the Product due to physical environments in excess of the limits set forth in Product manuals. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THIS PROVISION. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. NO REPRESENTATION OR WARRANTY OF THE DISTRIBUTOR SHALL EXTEND THE LIABILITY OR RESPONSIBILITY OF THE MANUFACTURER BEYOND THE TERMS OF THIS PROVISION. IN NO EVENT SHALL TEMALINE BE LIABLE FOR ANY RE-PROCUREMENT COSTS, LOSS OF PROFITS, LOSS OF USE, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES TO ANY PERSON RESULTING FROM THE USE OF TEMALINE'S PRODUCTS.

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INTRODUCTION

Purpose of this manual

This manual details how to install and maintain a TS2 device.

Details on operating instruction, plant maintenance and troubleshooting are also provided.

What TS2 is?

TS2 is a Temaline device acting as controller in the Temaline architecture.

TS2 managed applications include: Access Control, Time&Attendance, Canteen, light Intrusion detection and Lift.

It can manage up to 16 doors (with reader on a single side of the door or with reader on both sides of the door.
It can also manage up to 64 supervised inputs and 64 Digital Output.

It is connected to the Supervisor via Ethernet line. It manages all the field devices via LonWorks bus.

System Architecture

Figure 1 shows a typical system architecture in which the TS2 is inserted.

Other devices represented are:

- TemaPower: is the power supply used to supply the devices. It can be one Temaline TPU-xx device or a third party power supply.
- Temaline RTU devices: Fields devices used for the management of the doors.

The connections shown are:

- The Ethernet connection: it connects EBI supervision center with all the peripheral devices and peripheral device in peer to peer.
- The Power supply connection: it connects the Power Supply device with other Temaline devices.

- The Lonwork connection: to connect TS2 with Temaline field devices (RTUs).

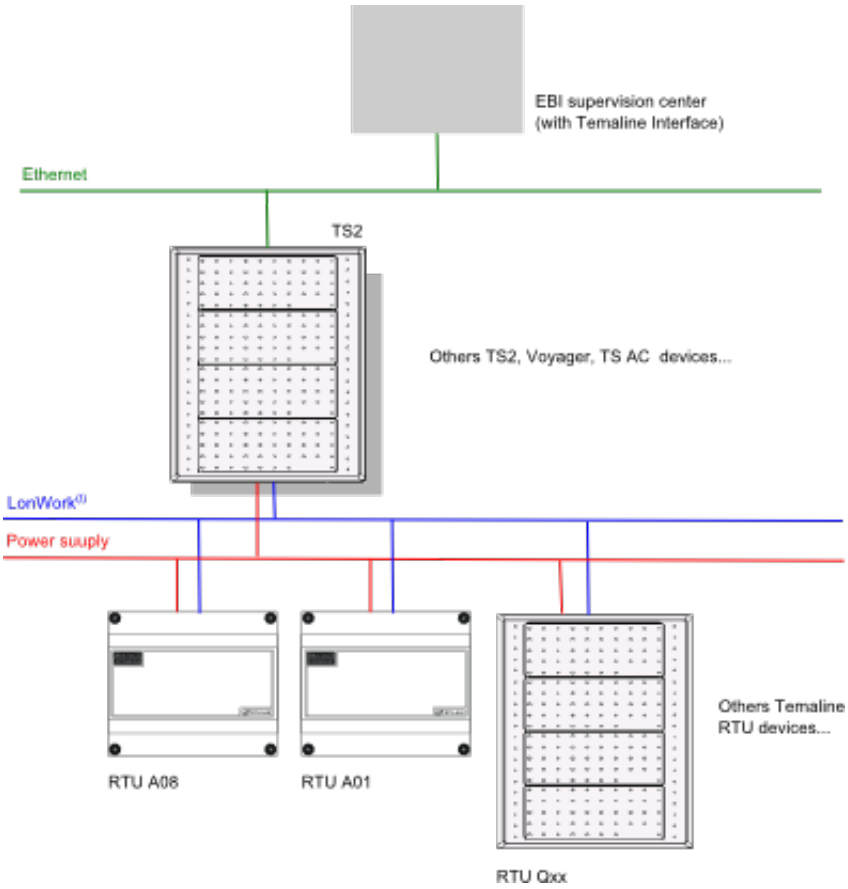


Figure 1 – TS2 typical system architecture

Device components

This chapter gives an overview of the components of TS2 device; the intent is to provide the main terms used into the installation phase.

For a more deep understanding of the device please refer to the chapter TS2 DEVICE ANATOMY on page 21.

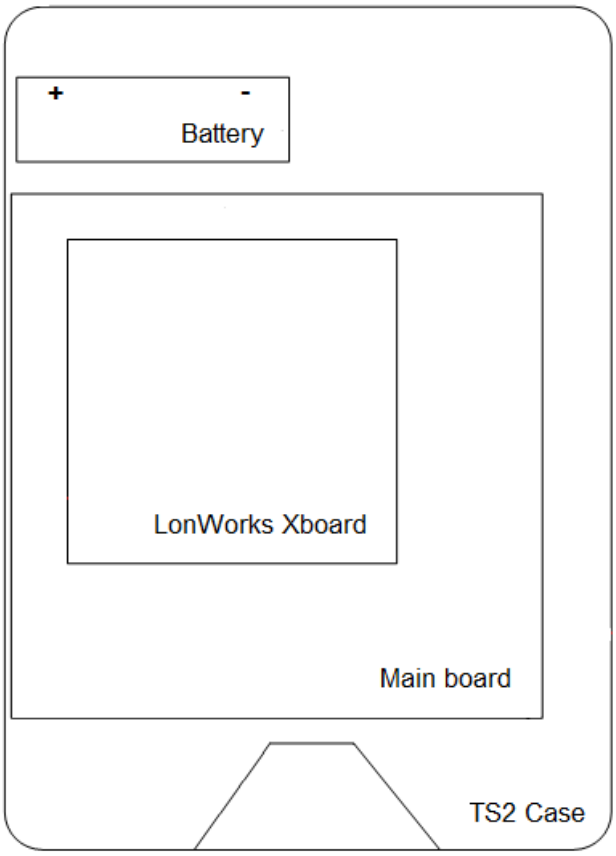


Figure 2 - TS2 components overview

Related documentation

Document	Content
EBI - 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.
TS2 Web interface	User manual of the TS2 Web Interface used for commissioning and maintenance operations.
Temaline - installation in Harsh Environment:	Ii is a whitepaper with Temaline system rules on the 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:

- TS2 device
- Metal Device Support Plate.

Into the device are housed:

- +12V connector
- LonWorks connector
- Battery 6V 1.2 Ah (not wired)

Optional Parts

It is possible to order following optional parts for this device:

Code	Item
TSACC01	TORX T10 screwdriver

Spare Parts

It is possible to order following spare parts for this device

Code	Item	Details
1801026	Battery	6V 1.2 Ah
1520185	TS2 LonWors Xboard	Plug-in for Lon connection
1700237	Fuse F1	3A 250V delayed (5X15 UL omega) wired

Mounting tools

The following screwdrivers are required for the installation:

- 3mm slotted screwdriver
- 3mm cross screwdriver
- 5mm cross screwdriver
- T10 Torx screwdriver

Wires Characteristics

Use this chapter to understand the type of wire you need to use for your plant.

Power supply wire

The TemaServer is powered at low voltage (12VDC±20% 600mA). It can be powered at low voltage ($12V_{DC}$ 600mA) by Temaline TPU03 battery-operated power supply module or by a vendor power supply with same characteristics.

In order to determine the correct size for power cables, refer to the below table
Make sure that the 12V cable corresponds in size to the norms indicated in the table below (voltage cable drop max = 2V):
Cable length (m) = 2V / (0.6A x 2 x (res [Ohm/km] /1000))

Type of cable			Length (m)
AWG	**mm2**	**Ohm/Km**	**600 [mA]**
10	5.25	3.41	489
12	3.3	5.7	278
14	2	8.8	189
16	1.3	14	119
18	0.9	21	79
20	0.6	34	49
22	0.35	52	32

Table 1 - Length of Power Cables (m)

LONWORKS® Data Cables

Data cables used with LonWorks® must be twisted-pair.

In a free-topology configuration or star connection, where all device are connected starting from one single point, the total sum of the cable lengths must not exceed 500m.

In a bus configuration or daisy chain configuration, where a device is connected to the previous one, the bus length must not exceed 2700m.

Refer to Table 2.for sizing data cables to be used for LonWorks® connection.

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 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**	**Bus Connection Maximum total length [m]**	**Free topology Connection Maximum node-node length. [m]**	**Free topology Connection 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

MOUNTING THE DEVICE

Dimensional requirements

Installation of TS2 is wall-mounted. It is recommended that you attach the cables to an encased box. The position selected for mounting the box must satisfy the requirements established for the mounting area and must allow the necessary space for opening the box (see Figure 3). In addition, there must be sufficient space around the bottom of the unit and to the right to allow you to access the box with a screwdriver.

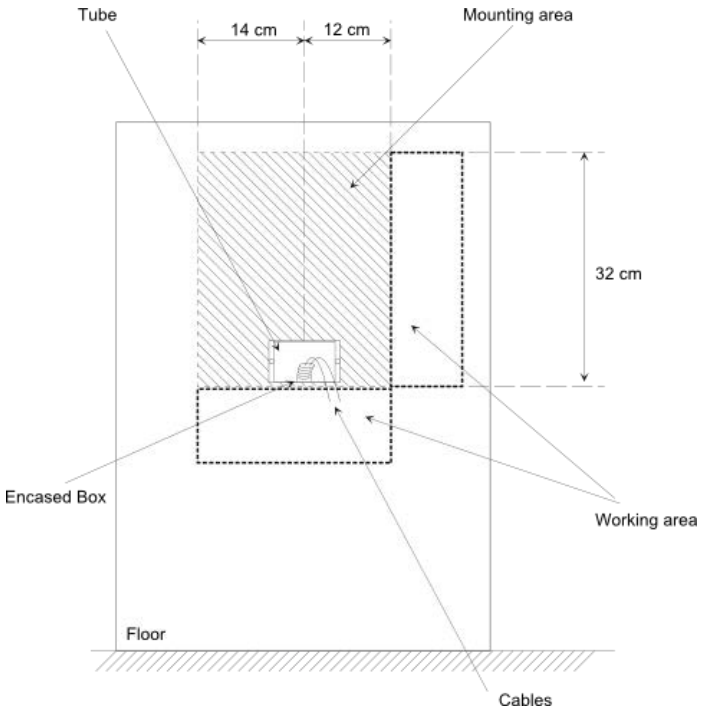


Figure 3 Space Requirements for Mounting

Attaching the Device Support Plate

To attach the device support plate, drill two holes into the wall, into which to introduce the M6 screws and plastic dowels that are to hold up the support plate (see Figure 4). **Make sure that the support plate attached to the wall is aligned with the niche on the lower part of the support plate** (use a ∅ 5mm cross screwdriver).

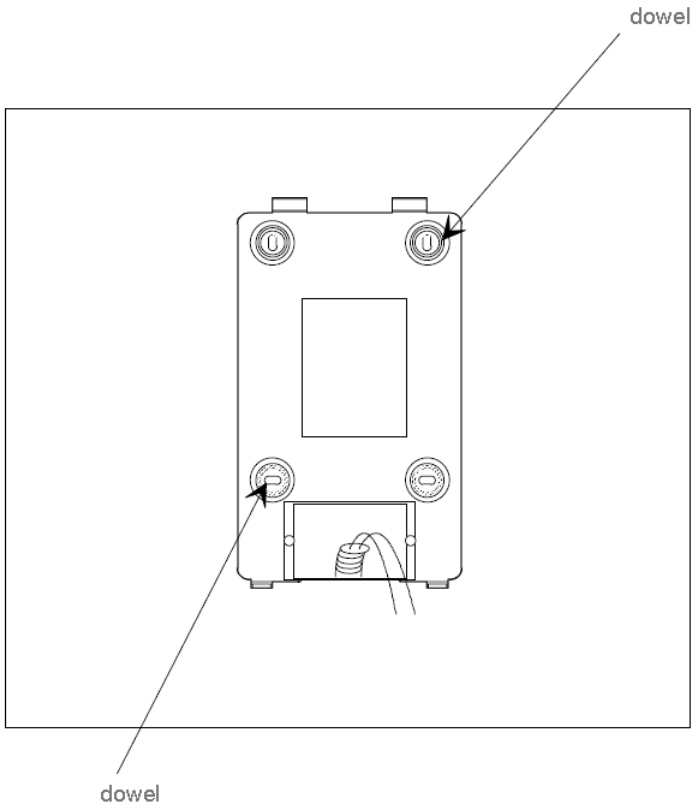


Figure 4 - Support Plate

Hooking Up the device

To hook up the device to the wall, follow these steps (see Figure 5):

1. Attach the upper part of the device to the upper hooks on the support plate.
2. Insert the cables into the device through the specified openings.
3. Tighten the two screws that secure the device to the support plate (use a ∅ 5mm cross screwdriver).

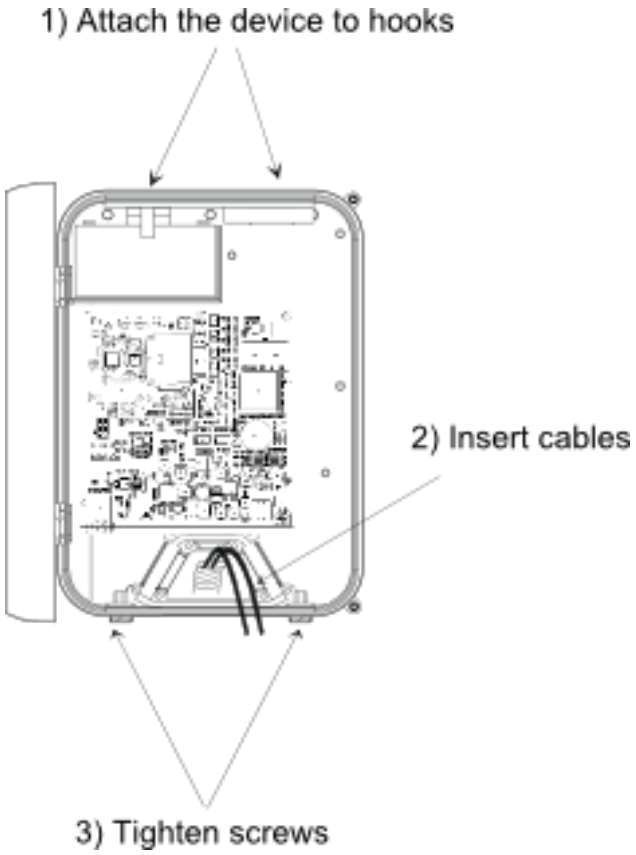


Figure 5 - Hooking Up the Terminal

CONNECTING THE CABLES

Cables to be connected are (see Figure 6):

- DC power supply
- LonWorks (RTUs connection)
- Ethernet (10/100BaseT)
- Battery

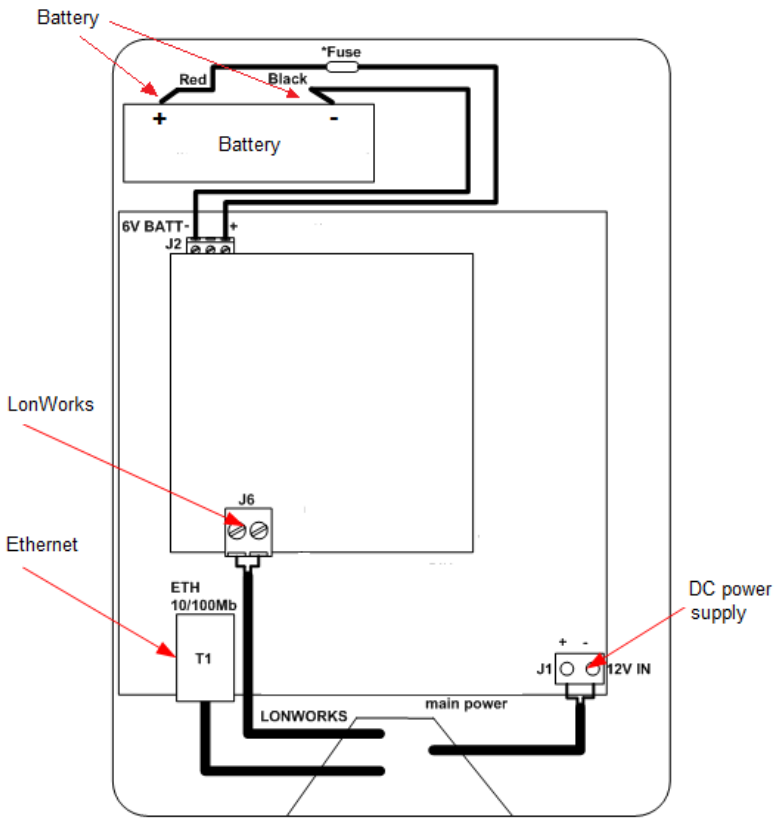


Figure 6 - Connecting the Cables

To connect the cables, follow these steps:

1. Connect all the cables to the board (see below details).
2. Line up the cables with the grooves at the back of the terminal and screw in the cable fixing plate that is used as a cable clamp (use a ∅ 5mm cross screwdriver).

Tip: Place the cables in the lower lateral grooves, so that they are not forced to negotiate tight bends.

Caution:

All the cables shall be separated at least 0.25 inches (10mm) from the battery wire

Connecting the DC Power Supply

From factory is plugged on **J1** connector a polarized indirect screw connector.

Attach the ends of the DC Power supply cable heads onto the indirect screw connector provided together with the device (use a ∅ 3mm slotted screwdriver).

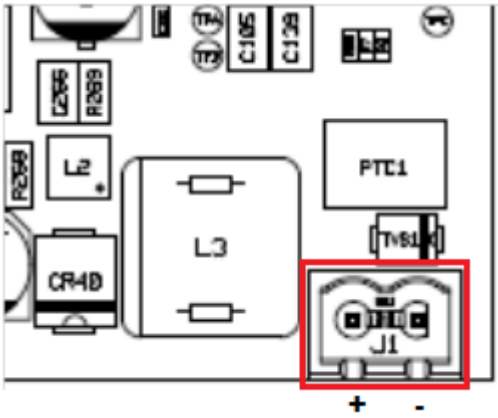


Figure 7 - DC Power Supply J1 connector

The **J1** connector is provided of a polarized indirect screw connector with the following connection characteristics:

- Conductor section AWG min = AWG24 max = AWG13
- Conductor section rigid or flexible min = 0.2 mm^2 max = 2.5 mm^2

Check: Once the DC Power Supply is properly connected and switched on the CR2 Green Led (+12VDC main power) present on the TS2 main board must be in ON status.

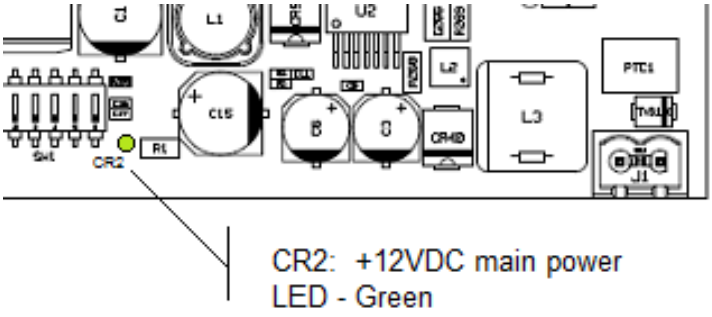


Figure 8 - CR2 Led position on main board

Connecting the LONWORKS Cable

From factory is plugged on **J6** connector an indirect screw connector.

Attach the ends of the LonWork cable heads onto the indirect screw connector provided together with the device (use a ∅ 3mm slotted screwdriver). The polarity of the LonWorks® cables is not significant.

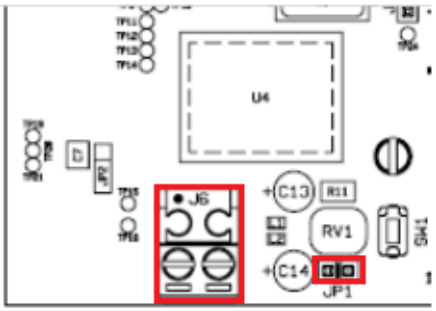


Figure 9 - J6 connector on LonWorks Xboard

The indirect screw connector has the following connection characteristics:

- Conductor cross section AWG min = AWG30 max = AWG14
- Conductor cross section flexible min = 0.05 mm^2 max = 1.5 mm^2
- Conductor cross section rigid min = 0.05 mm^2 max = 2.5 mm^2

If LonWorks is in **free topology configuration**, activate the 51 ohm terminator by closing the **JP1** on the Lonwork Xboard.
if two TS2 are connected on the same channel (shared load configuration) insert **JP1** just in one device.

If LonWorks is in **bus configuration**, place two terminators (with resistance values of 100ohm 1% ½W) at each end of the bus and remove (if it is present) the terminator for free topology configuration by opening the **JP1** on the Lonwork Xboard.
if two TS2 are connected on the same channel (shared load configuration) remove JP1 from both the devices.

Check1: Once the LonWorks bus is properly connected and the TS2 switched on the DL4 yellow Led (LonWorks service) must be OFF and the DL5 Green Led (LON/MIP Communication activity) must blink regularly. The two led are located on LonWorks Xboard.

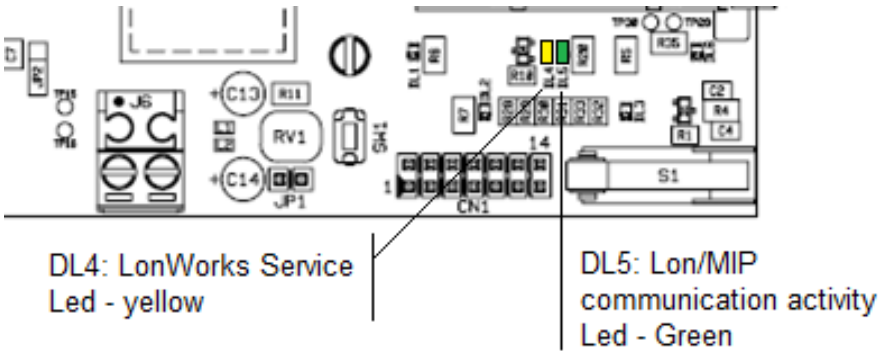


Figure 10 - DL4 and DL5 Led positions on LonWorks XBoard

Check2: Once the LonWorks bus is properly connected, the RTUs wired and the TS2 switched on use the RTU Service button to verify if the LonWorks is properly connected. See RTU installation guides to know where the Service button is located.

Connecting the network cable

The network cable must be a 10/100 BaseT standard unshielded CAT5 cable terminated with an RJ45 male connector.
It needs to be plugged on **T1** connector.

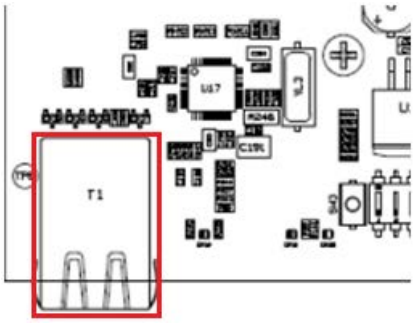


Figure 11 - Ethernet 10/100Mbit T1 connector

Characteristics of the network connection are:

- Auto-MDIX: automatically detects and corrects for straight or cross-over cables
- Error free operation up to 150mt: dependable network performance over long distance
- Superior 4.0 KV ESD protection: robust operation in Harsh environments

Check: Once the Ethernet is properly connected and the TS2 switched on the RJ45 green Led (Ethernet physical link) must be ON and the RJ45 Yellow Led (Ethernet Communication activity) must blink regularly. CR34 orange led shows the speed of the available Ethernet connection: if is ON the current speed is 100Mbits/s otherwise is 10Mbits/s. Led are located on TS2 main board.

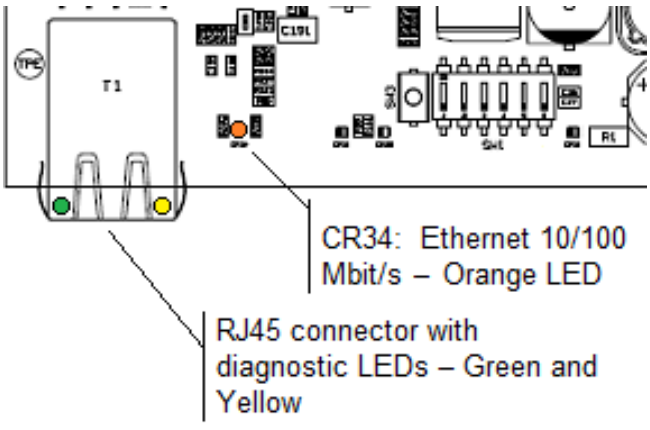


Figure 12 - RJ45 connector Led and CR34 Led positions

Connecting the battery

TS2 device is shipped with a non-connected battery.
Connect the polarized cable, already wired to **J2** connector, to the battery terminals:

1. Red cable faston to positive battery terminal.
2. Black cable faston to negative battery terminal (if it not already connected).

J2 connector is located on the TS2 main board.

Check: Once the battery is properly connected and the TS2 device powered, remove the DC Power supply J1 connector and verify the device is still up and running for at least 1 minute.

FINAL OPERATIONS

Closing the Terminal

To close the terminal, follow these steps:

1. Check that the fitting is positioned correctly.
2. Close the terminal by rotating its cover.
3. Use the two special lateral screws to secure the cover (see Figure 13). This operation requires a TORX anti-tamper T10 screwdriver.
4. Insert the small plastic plugs over the special screws.

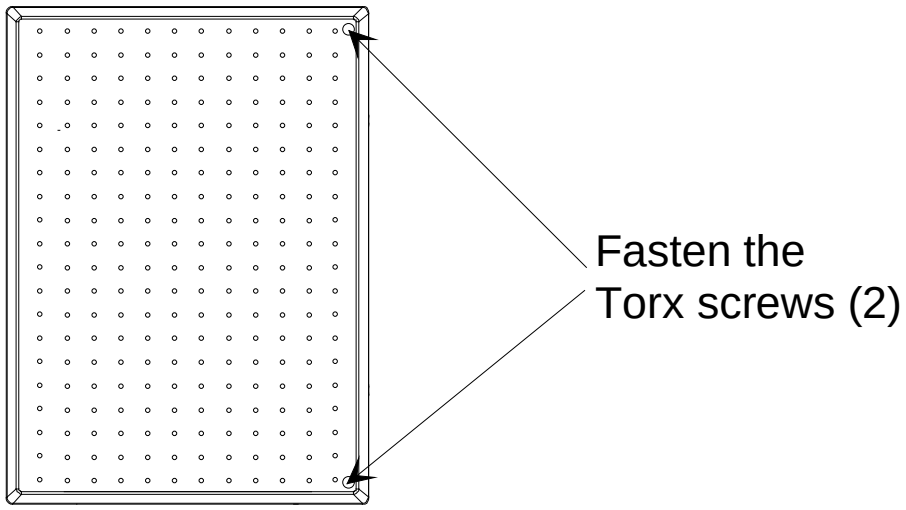


Figure 13 - Closing the Terminal

Commissioning tips

Commissioning of the device is outside the scope of this manual, never the less we will include here some tips on this activity addressing you to the EBI documentation for the full details:

EBI - Temaline Access Control Configuration Guide

Configuring the TemaServers

Factory default IP Address

A device from factory is configured with this default IP address:

160.221.230.127

After the first connection, the IP address must be changed because, to avoid conflicts, every device in the network must have a different address.

To change the IP address please refers to:
EBI - Temaline Access Control Configuration Guide
Configuring the TemaServers / Configuring the TemaServer2

Factory FW version

A device is shipped from factory with a running version of the FW application corresponding to the most recent version of the released FW available at the manufacturing time. The installed version may not be suitable for your plant or a more recent version of the FW could be available.
You should verify the FW version installed on your device and check the Temaline compatibility matrix distributed on the EBI site to see if it is required to update (or downgrade if you are working on a plant running with old releases) the device FW.

To verify the FW application version running on the device and to update the FW version please refers to:
Temaline - TemaServer2 Web Interface Guide
Maintenance / Downloading the program

TS2 DEVICE ANATOMY

Figure 14 provides a graphical representation of the TS2 device and of the boards (Main board and LonWorks Xboard) composing it.

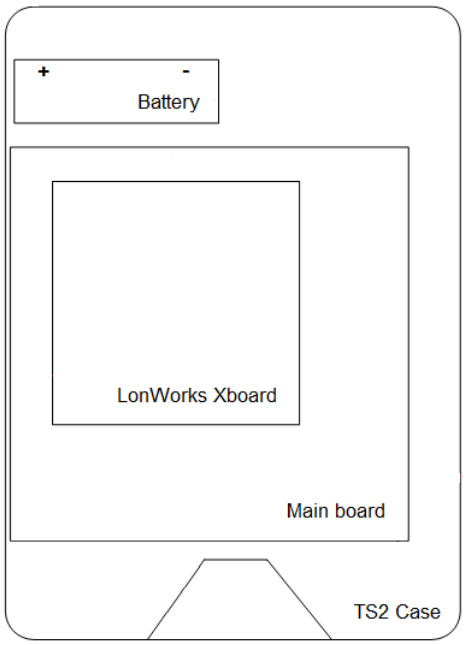


Figure 14 - Graphical representation of TS2 device

Figure 15 provides a detailed representation of the electronic and shows the main circuit components.

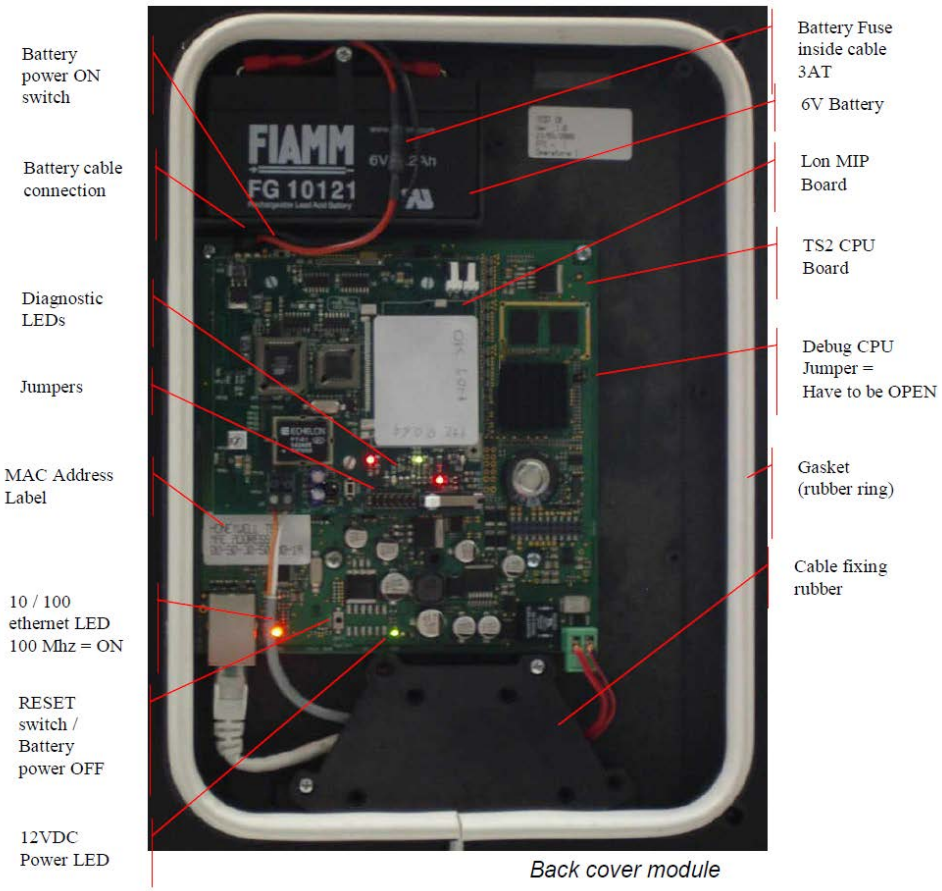
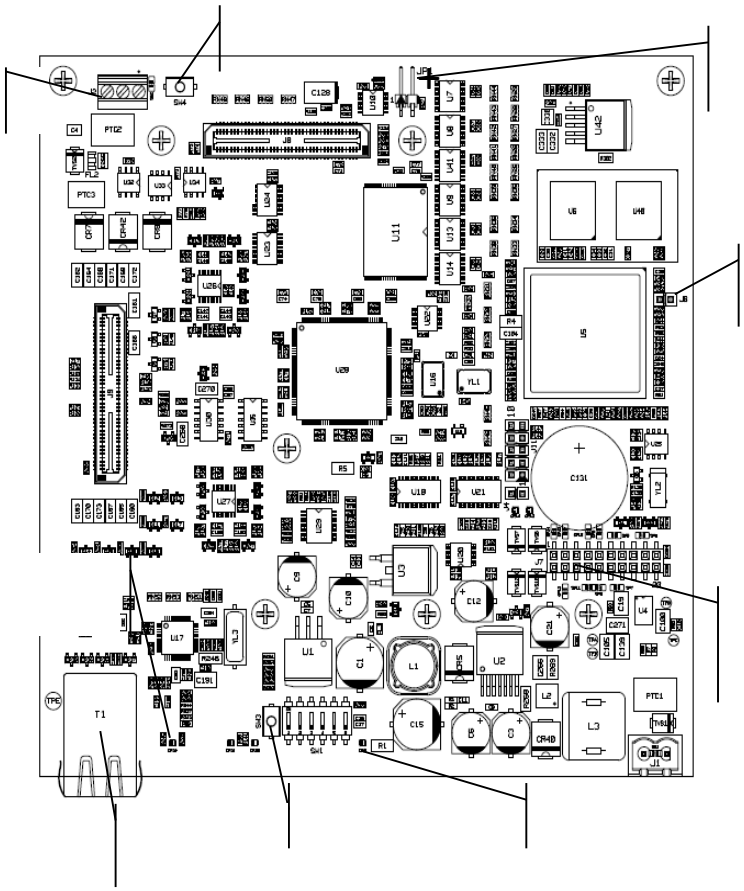


Figure 15 - TS2 Main circuit components

The purpose of this chapter is to explain in details all switches, led, jumpers and tampers present on the device and the related meaning.

TS2 Main board - Switches and LEDs



Switch	Function	Default state
SW3	Microprocessor Reset or Power OFF, for disconnect the battery, after 12VDC main supply removing	OFF
SW4	Power ON from battery when is needed powered the TS2 without the 12VDC main power source (limited time)	OFF

Jumper	Function	Default state
JP1	Flash memory Boot space protection Close = boot protected (Only read mode) Open = boot read / write mode	CLOSE
J6	CPU debug jumper – have to be OPEN	OPEN

LED	Function	Default state
CR2	+12VDC main power LED - Green ON = +12VDC present OFF = +12VDC not present	ON

CR34	Ethernet 10 / 100 - Orange ON = Ethernet working at 100 Mbit/s OFF = Ethernet working at 10 Mbit/s	-
RJ45 green LED	Ethernet physical Link ON = Good link OFF = no link	-
RJ45 yellow LED	TX / RX activity Blinking when RX or TX is active OFF = no RX/TX activity	blink

Table 4 - CPU switches and LEDs

Device Configuration Jumpers

There are seven configuration jumpers (**CN1**) on TS2 Lonwork Xboard as shown in the following picture.

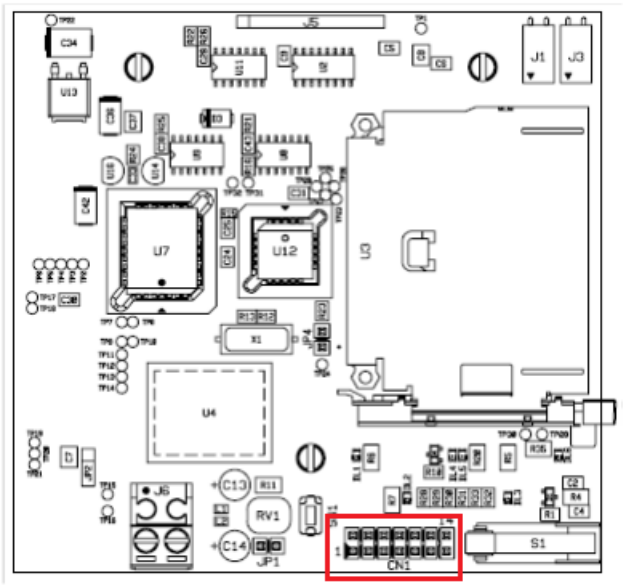


Figure 16 – Configuration jumpers

For normal operation, configure the jumpers as specified in Table 5.

Jumper	Function	Default state
CN1.1	Spare position	Close
CN1.2	Presence of the battery. It instructs the device on the presence of the internal battery. The use of the internal battery can be avoided when the device is powered with an external UPS. When the jumper is Closed and the device is restarted, the absence of the internal battery is no more considered a failure for the device. Open = battery present Close = battery not present	Open (Battery present)
CN1.3	FW application roll back. When the jumper is closed and the device is restarted, it restores the alternative version of the application present on the device (if any).	Open

Jumper	Function	Default state
	To be able to work again with the device after the reboot, the jumper must be set back to Open. Open = current FW application valid Close = force FW application roll back	(Current FW application is valid)
CN1.4	Restore the device to Factory configuration. When the jumper is closed and the device is restarted, the factory configuration is restored to: all data present in the memory and in the DB of the device is lost and the communication parameters are reset to the factory default values. In particular IP address of the device is set to 160.221.230.127. To be able to work again with the device after the reboot, the jumper must be set back to Open. Open = Use current configuration Close = restore factory configuration	Open (Use current configuration)
CN1.5	Linux Console activation. This jumper is used for activating the LINUX Console of the device. When the jumper is closed and the device is restarted, the use of the console is enabled. The activation of LINUX console may be required only for deep debug purpose; don't change this jumper if it is not specifically required from Honeywell Technical Assistance Center. Open = Linux console not active Close = Linux console active	Open (Linux console not active)
CN1.6	Spare position	Open
CN1.7	Manufacturing test. The jumper is activated when you boot the Manufacturing Test Application instead of the FW Application. This Jumper is used for testing in the factory only. Not suitable for field operations. Open = FW application active Close = Manufacturing Test active	Open (FW application active)

Table 5 - Configuration of Jumpers on Main Board

TS2 Lonwork Xboard - Jumpers and Switch

Two jumpers and one switch are on to the Lonwork MIP board as in the following picture.

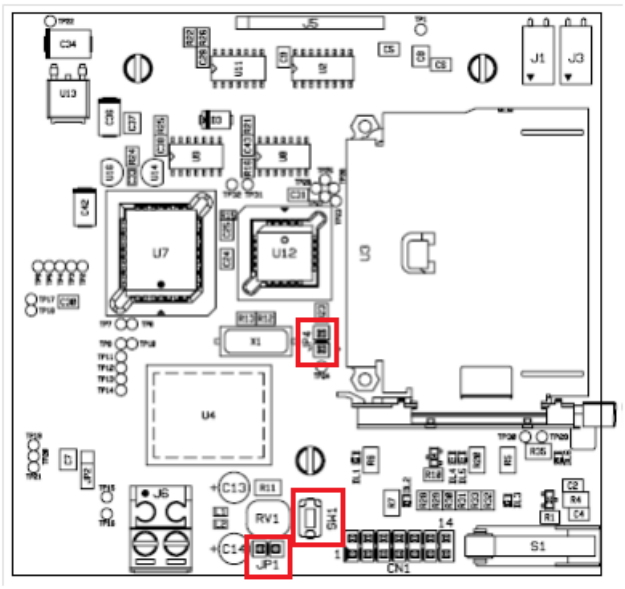


Figure 17 – LonWork Jumpers and Switch

For normal operation, configure the jumpers on the main board as specified in Table 6.

Jumper	Function	Default state
JP1	LON net 51 Ohm termination	Close
JP4	MIP Flash (U7) write protect	Open Note: Close only in case of MIP firmware update

Switch	Function	Note
SW1	LON MIP service PIN	Use only in case of MIP Firmware update

Table 6 - Configuration of Jumpers on TS2 Lonwork Xboard

TS2 LonWorks Xboard - diagnostic and MIP LEDs

There are six diagnostic LEDs on the TS2 LonWorks Xboard as shown in the following picture.

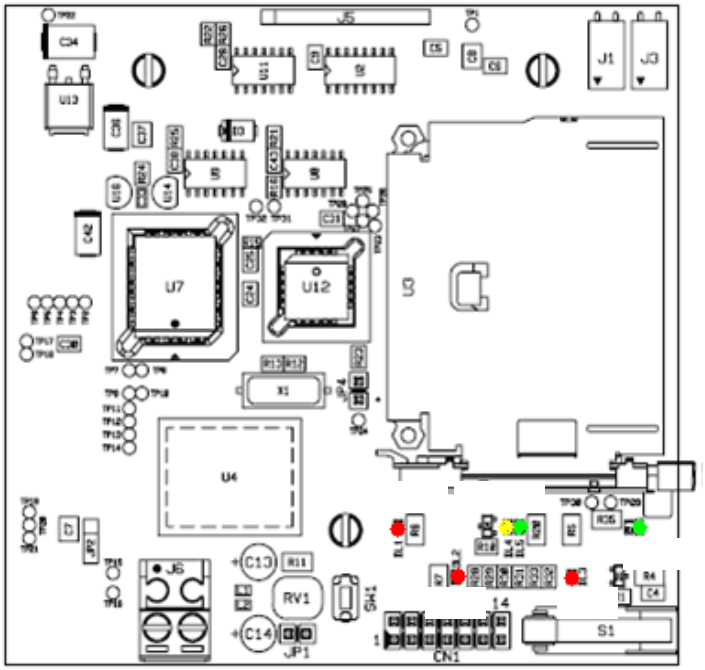


Figure 18 – Diagnostic Led on TS2 LonWorks Xboard

For normal operation, see the LED description as specified in Table 7.

LED	Function	Note	Normal status
DL1 (red)	Presence of a running TS2 test application	ON = test application running OFF = test application not present	OFF
DL2 (red)	Supervision Ethernet LAN communication failure	The status of this LED is valid only if the TS2 application is running ON = communication failure OFF = communication OK	OFF
DL3 (red)	Data Base Failure	The status of this LED is valid only if the TS2 application is running ON = DB not present OFF = DB present	OFF
DL4 (yellow)	LON MIP service LED	OFF = working Steady On: Neuron Chip without application and not configured Blinking 0.5Hz: Neuron Chip in application status present, but not configured	OFF
DL5 (green)	LON MIP internal communication activity	Blinking = MIP working Steady ON or OFF = lack of communication with TS2 microprocessor	Blink

LED	Function	Note	Normal status
DL6 (green)	Presence of a running TS2 application	ON = application running OFF = application not present	ON

Table 7 - Diagnostic and MIP LED

Device Tampers

Anti open tamper

An anti-open tamper **S1** is present into the device. When the case is closed the tamper switch is pressed and so switched off.

External tampers connection

The two connectors **J1** and **J3** present on TS2 LonWorks Xboard are designed to connect up to two external tampers for the device (not provided).
Such tampers could be used as anti removal tamper for the device and to connect the anti open tamper of an external case who hosts the TS2 device.
From factory, and when external tampers are not used, J1 and J3 are closed with two jumpers.

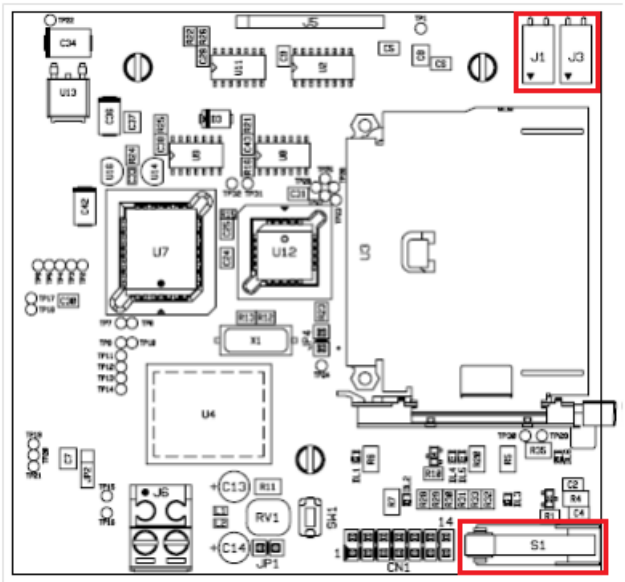


Figure 19 - Tampers

For normal operation, configure the jumpers on the main board as specified in **Error! Reference source not found.**.

Jumper	Function	Default state
S1	Anti-Open Tamper switch	Close
J1	To connect an external (not provided) tamper	Close
J3	To connect an external (not provided) tamper	Close

Table 8 - Tampers

If you need to connect an external tamper to the connector J3 you can use the below schematic.

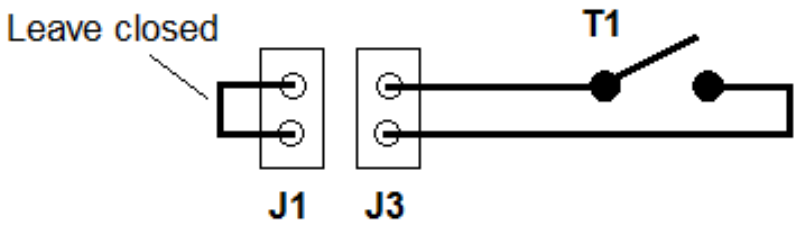


Figure 20 – Single external tamper connection schema

Please note that:

J1 and J3, and so the two external tampers, are in series and thus it is not possible to distinguish which of the two tampers raised the alarm. From the supervision center the two tampers generate the same events.

OPERATING INSTRUCTIONS & MAINTENANCE

Reset the TS2 device

To reset the TS2 device press for at least 3 seconds the Reset Button.
Reset button is located on the LonWorks Xboard (See Figure 21)

Switch off the TS2 device

To switch off the unit, follow these steps:

1. Open the unit by unscrewing the two screws on the front cover (requires TORX Tamper-Resistant T10 screwdriver).
2. Remove the **J1** connector of the incoming 12Vcc.
3. Press for 3 seconds the reset button.

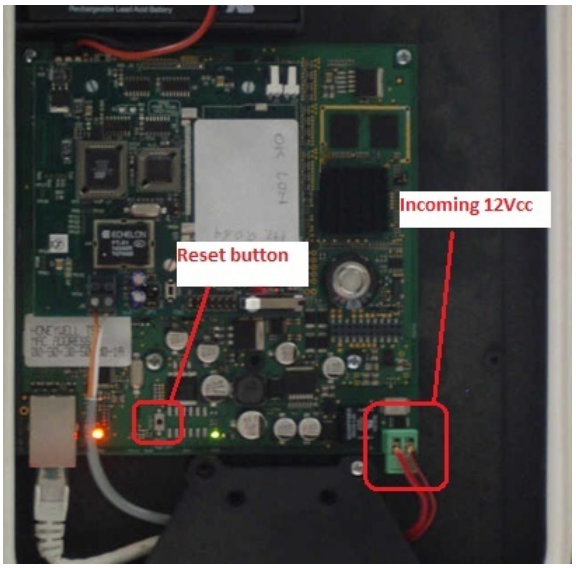


Figure 21 – TS2 device switch off

TS2 application quick health check

Using diagnostic Led, present on to the TS2 LonWorks Xboard, it is possible to perform a first quick check of the TS2 application without the use of SW tools.

Position of diagnostic Led is shown on the below picture.

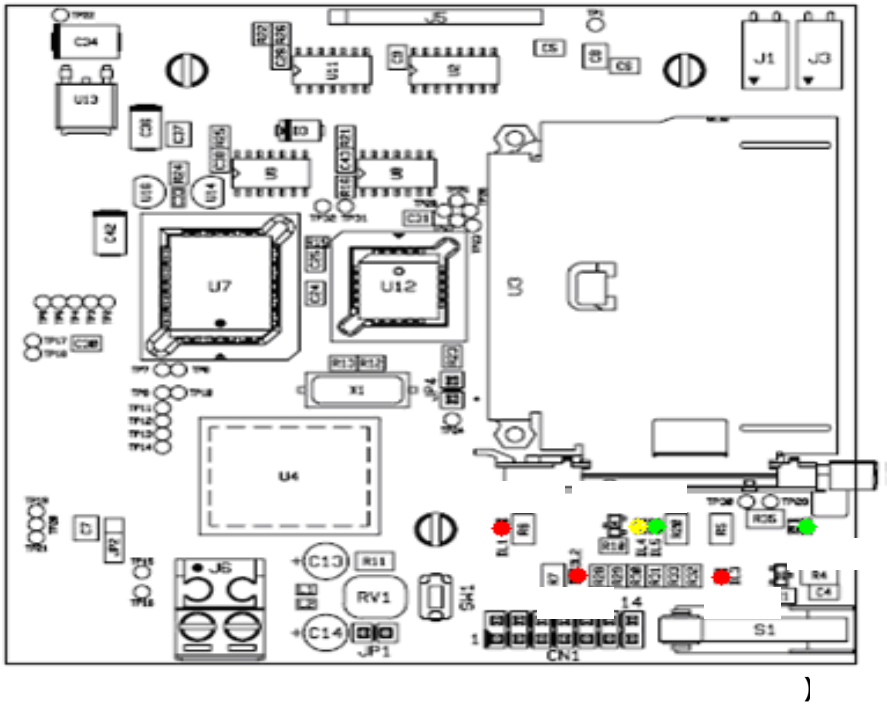


Figure 22 - TS2 Lonworks XBoard diagnostic Led

The below table show the checks it is possible to perform, the Led to be checked and possible approaches to overcame the issues.

Function	Led and normal status	Possible failure(s)	Approach
Ethernet Communication	DL2 = OFF	If DL2 = ON no Ethernet communication	Check the Ethernet wiring. Check the status of the network,
TS2 application running	DL6 = ON DL1 = OFF	If DL6 = OFF no application running	Reset the TS2 device using Reset button.
		If DL1 = ON the device is running the test application	Move the device from manufacturing test to FW application closing CN1.7.
Data Base present	DL6 = ON DL2 = OFF DL3 = OFF	If DL3 = ON no application DB on the device	Check if the supervision centre is up and running. Check if the TS2 device is properly configured into EBI
		If DL2 = ON Communication failure with the supervision centre	Check the Ethernet communication first; without Supervision centre communication there will not be any DB download.
LonWorks Communicatio n	DL5 = blink	If DL5 steady OFF	The TS2 LonWorks Xboard is broken and it must be substituted.

		If DL5 steady ON	No RTUs configured. Configure the RTUs
	DL4 = OFF	If DL4 = ON LonWorks MIP without application and not configured If DL4 = blinks LonWorks MIP has the application but it is not configured	The TS2 LonWorks Xboard is broken and it must be substituted.

Table 9 - Application quick health checks

TS2 Cable Fuse replacement

One of the wires for the battery connection has a fuse embedded. If you need to replace this fuse, you must:

1. Have the proper spare part: Fuse F1: 3A 250V delayed (5X15 UL Omega) wired.
2. Replace the cable
3. Verify if the battery wires are connected with the right polarity.

TS2 Battery replacement

The battery has to be replaced every 3 years. There is no need to check the status of the battery as it is automatically checked by the software application.

To replace the battery follow these steps (see Figure 23):

1. Switch the unit OFF
2. Unscrew the two special lateral screws that secure the cover. This operation requires a TORX anti-tamper T10 screwdriver.
3. Unscrew the battery plastic fixing.
4. Disconnect the battery leads pulling the wire terminals connectors.
5. Replace the battery with the spare one (6V 1.2 Ah)
6. Connect leads to the battery terminals. Be sure about the polarity (red=+, black=-).

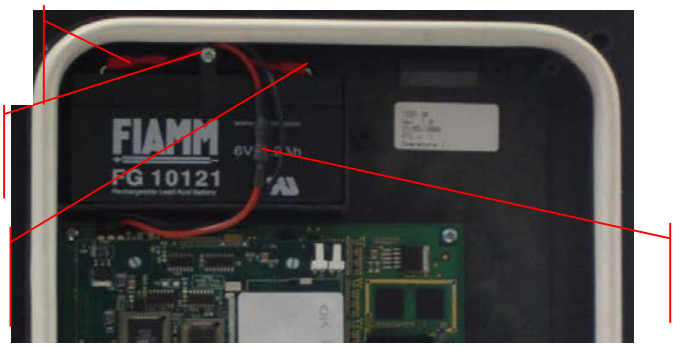


Figure 23 - TS2 battery replacement diagram

The battery is supervised in case of:

- Not presence
- Low capacity
- Protection fuse blowout

CAUTION:

Risk of explosion if the battery is connected in the reversed polarity.

Batteries must be recycled.

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

CONDITIONS RESULTING IN IMPAIRED OPERATION

Impaired operation conditions	Impaired operation result
Battery connected in reverse way	Risk of explosion if the battery is connected with the reversed polarity, The fuse on the battery cable will be burned
12VDC connected in reverse way	The protection inside the TS2 will avoid permanently damage
LON connected on the 12Vcc	The protection inside the TS2 will avoid permanently damage, the communication with other device will be affected
12VDC connected on the LON	The protection inside the TS2 will avoid permanently damage, the communication with other device will be effected

Table 10 - Condition resulting in impaired operation

PROTECTIVE FEATURES (WARNING OF BYPASSING)

Unit Name	Protective features and warning
TS2	To reduce the fire risk, do not operate the device over the operating temperature; use specified battery and fuse.
TS2	To reduce the electric shock risk, do not wire the device during power on condition.

Table 11 - Protective features and warning

TECHNICAL SPECIFICATIONS

	Parameter	Value
Electrical	DC power supply	12V ⎓ ±20% - 7.2W (battery totally discharged)
	Battery autonomy	90 minutes (Battery 100% efficiency)
	Battery recharge time	80% of capacity in 8 hours
	Battery life	Average battery lifespan = 3 years at 25º room temperature; with higher temperature the battery average life decreases (35º = 2 years)
Technical	Microprocessor	32bits – Freescale Coldfire MCF5471 Operative system LINUX
	Flash Memory	High reliability NOR Flash Spansion 64 Mbytes
	SDRAM memory	High performance DDR SDRAM 128 Mbytes
	Real Time Clock	Internal RTC; retention time 10 days using super capacitor.
	LAN Ethernet connection	10/100 BaseT standard unshielded cable on RJ45 • Auto-MDIX: automatically detects and corrects for straight or cross-over cables • Error free operation up to 150mt: dependable network performance over long distance • Superior 4.0 KV ESD protection: robust operation in Harsh environments
	LONWORKS® connection	Unshielded twisted-pair cable in free topology (MIP FT3150)
Physical	Size	221x305x47 mm
	Weight (including carton box)	2.4 kg
	Case	Plastic case ABS UL 5VA – thickness 3mm Not painted - Colour = grey RAL 7035
	Security screw	2 Torx screws
	Anti-Tampering	1 internal switch (against opening)
Environmental	Protection level	IP55
	Environmental temperature for correct operation	-10 to 50°C
	Storage temperature	-20°C ÷ 50°C Note: During the storage period it is recommended recharge the battery at least once every six months.
	Storage and operating humidity	0÷90% not condensing

REGULATIONS

CE Compliance

CE

Company name: Honeywell S.r.l. Via Philips, 12 20052 Monza Italy
Product name: TS2
Product models: TS2, TS2_AC, TS2-NE, TS2-UL

Are 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 55032:2012 + AC:2013
EN 50130-4:2011+A1:2014
EN 60950-1:2006+A11:2009 +A1:2010 +A12:2011+A2:2013
EN 50581:2012

"Access Control System for use in Security Applications" Compliance

Company name: Honeywell S.r.l. Via Philips, 12 20052 Monza Italy
Product name: TS2
Product models: TS2, TS2_AC, TS2-NE, TS2-UL

Are in conformity with the following harmonized standard(s) and other normative document(s):

EN50133-1: 1996/A1: 2002
EN50133-2-1: 2000
EN50133-7: 1999

In accordance to requirements for Security class equipments:

Recognition class: 2, 3

Access class: B
Environment Class: II

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.

FCC Notice


Company name: Honeywell S.p.a.
Identification code: PS081204

This device complies with FCC rules Part 15. Operation is subject to the two following conditions:

- This device may not cause harmful interference and
- This device must accept any interference received, including interference that may cause undesired operations.

Cet appareil est conforme à la section 15 des réglementations de la FCC. Le fonctionnement de l'appareil est sujetaux deux conditions suivantes :
(1) cet appareil ne doit pas provoquer d'interférences néfastes, et
(2) cet appareil doit tolérer les interférences reçues, y compris celles qui risquent de provoquer un fonctionnement indésirable.

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.

The user is cautioned that changes and modification made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment.

RoHS compliance

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.
2011/65/EU

WEEE compliance

In accordance with directive 2012/19/EU regarding waste electrical and electronic apparatus (WEEE) effective since 14 February 2014, Honeywell commits, when requested by the customer, to the collection, treatment, recovery, and disposal of the apparatus produced.
Customers in the European Union are advised to dispose this product, at the end of its useful life, in accordance with 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.

Appendix 1 – 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