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USER MANUAL

SYS-04240-23

Railway Automotive Logger Unit

1-3 – 7 January 2021 – SYS-04240-23_Man_ENG_1-3

Trademarks

All trademarks and registered trademarks are the property of their respective owners.

Intended audience

This document is intended for **system integrators**, who are skilled persons with a thorough knowledge in bringing together component subsystems into a whole, ensuring that those subsystems function together.

Revision history

Revision	Description	Date
1-0	First release	12 October 2020
1-1	Updated FCC labeling information	1 December 2020
1-2	Updated FCC/ISED information	15 December 2020
1-3	Removed sections in French language. Removed ISED information. Minor corrections	7 January 2021

CONTENTS

1 SAFETY INSTRUCTIONS

IMPORTANT: Read carefully and understand the instructions and warnings contained in this document before installing / using the product. Keep this document for future reference.

To lower the risk of personal injury, electric shock, fire or damage to equipment, observe the instructions and warnings contained in this document.

Failure to comply with the instructions and warnings contained this document, violates the standards of safety, design, manufacture, and intended use of the product.

Eurotech assume no liability for any damage caused by failure to observe the instructions and warnings contained this document.

Whenever you have any doubt regarding the correct understanding of this document, contact the Eurotech Technical Support (for more information see "How to receive technical assistance", page 9).

1.1 Warning messages used in this document

1.1.1 Warning messages for harm to persons

To indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury, the following message is used:

 **DANGER**	
Sign (if necessary)	**TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT** **Text that explains how to avoid this hazard**

To indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury, the following message is used:

 **WARNING**	
Sign (if necessary)	**TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT** **Text that explains how to avoid this hazard**

To indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, the following message is used:

 **CAUTION**	
Sign (if necessary)	**TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT** **Text that explains how to avoid this hazard**

1.1.2 *Warning messages for damage to property*

To indicate potential risks of damage to the supported product (or to other property), the following message is used:

NOTICE	
SIGN (if necessary)	**Text that explains how to avoid damaging the supported product (or other property)**

1.2 Warning: power supply safety

WARNING

ELECTRIC SHOCK HAZARD

Failure to supply power correctly or to follow all operating instructions correctly, may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely supply power to the product, complete the following steps:

1. **Observe all the instructions for safety, installation, and operation**
2. **Make sure your hands are dry**
3. **Make sure that all the cables used:**
   a. **Are in good condition before using them**
   b. **Meet the product requirements and comply with the relevant standards and regulations**
4. **Position cables with care. Do not position cables in places where they may be trampled or compressed by objects placed on them**
5. **Make sure that the power-points and plugs are in good condition before using them**
6. **Do not overload the power-points and plugs**
7. **Make sure that the product maintains a proper grounding connection. Always use the earth protection terminal to connect the product to an earth point in the installation: see also "Earth Connection Terminal" page 27**
8. **Use a power supply that meets the product requirements and complies with the relevant standards and regulations. In case of uncertainties, contact the Eurotech Technical Support Team (for more information see "How to receive technical assistance" on page 9)**
9. **Connect power after the installation of the system has been completed**
10. **Never connect or disconnect the cables with the system or the external apparatus switched ON.**

1.3 Caution: Product's surfaces may become hot

Depending on the operating environment temperature, product's surfaces may become hot, creating a burn hazard.

Always allow the product's surfaces to cool before touching them.

1.4 Caution: wireless safety

CAUTION

The antennas used with the product must be installed with care, avoiding any interference with other electronic devices and keeping a distance from persons greater than 20 cm. If these requirements cannot be satisfied, the system integrator has to assess the final product with respect to SAR regulations.

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2 HOW TO RECEIVE TECHNICAL ASSISTANCE

2.1 How to ask for technical support

To ask for technical support, complete the following steps

1. Go to the Eurotech Global Support Centre: https://support.eurotech.com/
2. Submit a support request
3. Wait for the reply from the Support Team with the information you required

2.2 How to return a product to Eurotech

Any product returned to Eurotech that is found to be damaged due to inappropriate packaging will not be covered by the warranty

To send a product for repair, complete the following steps:

1. Go to the Eurotech Global Support Centre: https://support.eurotech.com/
2. Submit an RMA request
3. Wait for the reply from the RMA Department. It will contain:
    - The RMA number
    - The shipping information
4. Pack the product adequately using anti-static material and place it in a sturdy box with enough packing material to protect it from shocks and vibrations
5. Ship the product to Eurotech following the information received from the RMA Department.

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3 CONVENTIONS USED IN THIS DOCUMENT

3.1 Conventions for signal names

Convention	Description
GND	Ground
#	Active low signal
+	Positive signal; Positive signal in differential pair
-	Negative signal; Negative signal in differential pair
3.3	3.3 V signal level
5	5 V signal level
NC	No Connection
Reserved	Use is reserved to Eurotech

3.2 Conventions for signal types

Convention	Description
I	Signal is an input to the system
O	Signal is an output from the system
IO	Signal may be input or output
P	Power and ground
A	Analog signal
NC	No Connection
Reserved	Use is reserved to Eurotech

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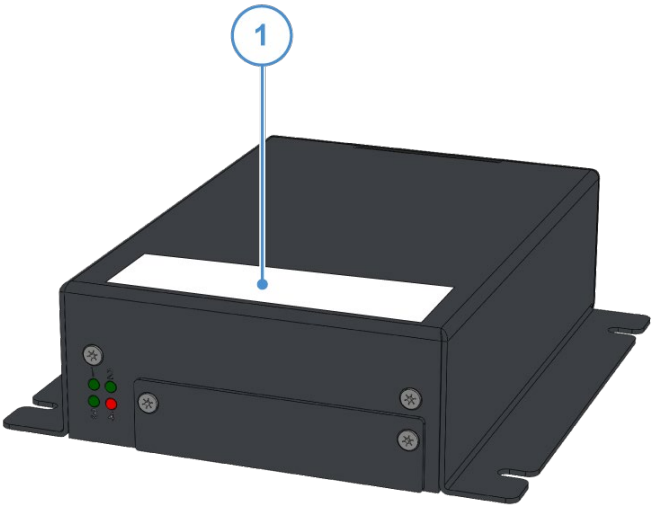
4 PRODUCT OVERVIEW

The SYS-04240-23 is a compact device to be used as Railway Automotive Logger Unit.

Figure 1. SYS-04240-23 front view

4.1 Product information label

The Product information label is placed on the top side of the product according to the following figure:



Ref#	Label information
1	• Eurotech logo • CE mark • E-Mark • "MADE IN EU" statement • FCC ID statements • Product model number • Product serial number • Power requirements* • WEEE symbol

* the symbol ⎓ stands for direct current

4.2 Intended and Not Intended use

4.2.1 Intended use

The SYS-04240-23 is intended to be used as Railway Automotive Logger Unit.

The SYS-04240-23 must:

- Be powered using a 24 VDC voltage that fulfills the required standards and the technical specifications. The negative battery pole (-) must be connected to the body of the vehicle. The enclosure of the unit must be connected to the body of the vehicle
- Be used with appropriate interconnecting cables
- Be used on motor vehicles that fulfil all standard requirements
- Be mounted inside the vehicle in a location not accessible to passengers and operating staff
- Be kept at a distance of at least 20 cm from the user
- Be used with the earthing terminal connected to an earth point in the installation

4.2.2 Not Intended use

Do not use the SYS-04240-23:

- In functions related to the direct control of a vehicle:
  - Engine, Gears, Brakes, Suspension, Active steering, Speed limitation devices, etc
  - Driver's position, e.g. Seat or Steering wheel positioning etc
  - Driver's visibility: e.g. Dipped beam, Windscreen wipers etc
- In functions related to the drivers, passengers and other road-users protection:
  - Airbag and Safety restraint systems etc
- In functions which, when disturbed, cause confusion to the driver or other road users:
  - Optical disturbances: e.g. Direction indicators, Stop lamps, End outline marker lamps, Rear position lamp, Light bars for emergency system, Warning indicators, Lamps or Displays related to functions in clauses (a) or (b) which might be observed in the direct view of the driver
  - Acoustic disturbances: Anti-theft alarm, Horns etc
- In functions related to vehicle data bus functionality:
  - Data transmission on vehicle data bus-systems, which are used to transmit data, required to ensure the correct functioning of other immunity-related functions
- In functions that affect vehicle statutory data: Tachograph, Odometer etc
- In industrial applications
- In safety-critical applications
- Outdoors
- In environments with potentially explosive atmospheres
- If not installed according to the instructions and warnings contained in this document

5 REGULATORY INFORMATION

5.1 CE marking

This product is CE marked.
The product meets the guidelines listed in the following sections.

Eurotech is not responsible for the use of this product together with equipment (e.g. power supplies, personal computers, etc.) that are not CE marked and compliant with the requirements specified in this document.

5.1.1 Safety

This product is compliant with the standard EN 62368-1:2014 on the safety requirements in information and communication technology equipment.

5.1.2 Packaging and packaging waste

This product has been manufactured in compliance with the European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste.

5.1.3 Product disposal and recycling

This product, at the end of its life cycle, must be collected separately and managed in accordance with the provisions of the Directive 2012/19/EU on waste of electrical and electronic equipment.

For details and more information:

- See: "WEEE compliance" below
- Contact the Eurotech Technical Support (see “How to receive technical assistance” on page 9).

5.1.4 WEEE compliance

In compliance with the Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), the symbol on the right, shown on the product or within its literature, indicates separate collection for electrical and electronic equipment (EEE) that has been placed on the market after 2005.

This product, at the end of its life cycle, must be collected separately and managed in accordance with the provisions of the current Directive on waste of electrical and electronic equipment.

Because of the substances present in the product, improper disposal can cause damage to human health and to the environment.
For collect and recycling information contact the Eurotech Technical Support (see How to receive technical assistance on page 9).

5.2 Temperature

The product passed the following type tests as defined in EN 50155:

- Cooling test (class T3)
- Dry heat test (class T3)
- Damp heat test
- Low temperature storage test

Temperature class T3 as defined in EN 50155: operating temperature: -25 to +70 °C (+85 °C for 10 minutes).

5.3 Interruptions of voltage supply

The product meets the requirements defined in EN 50155, class S2 (10 ms. interruptions).

5.4 Vibration

The mechanical strength of the product meets the requirement of the category 1 class B defined in EN 50155.

5.5 EMC

The product meets the requirements defined in EN 50155.

5.6 Safety

The product meets the requirements defined in EN 62368.

5.7 Fire and smoke

The product meets the requirements defined in EN 45545.

5.8 Road vehicle compliance

This product has been manufactured in compliance with the ECE ONU R10 Rev. 5.

5.9 RoHS 3 compliance

The product has been manufactured in compliance with the following Directives:

- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- Commission Delegated Directive (EU) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances

5.10 REACH compliance

This product has been assessed to be in compliance with the regulation (EC) No. 1907/2006 (REACH) (with the exceptions allowed by the EU Technical Committee).

Eurotech has set in place a monitoring process to assess compliance to REACH regulation.
For details and more information contact the Eurotech Technical Support (see How to receive technical assistance on page 9).

5.11 FCC Regulatory Notices

5.11.1 FCC marking

This product is FCC marked and comply with the regulatory information reported in the following sections.
Eurotech is not responsible for the use of the product together with equipment (for example: power supplies, personal computers, etc.) that are not FCC marked and not compliant with the requirements specified in this document.

Modification statement

Eurotech has not approved any changes or modifications to the product by the user. Any changes or modifications could void the user's authority to operate the product.

5.11.2 FCC Class B Digital Device Notice

This product complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this product may not cause harmful interference, and (2) this product must accept any interference received, including interference that may cause undesired operation.

Note: This product has been tested and found to comply with the limits for a Class B digital product, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product 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 product does cause harmful interference to radio or television reception, which can be determined by turning the product 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 product and the receiver
- Connect the product 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

5.11.3 RF Radiation Exposure Statement

This product complies with FCC radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.
This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

5.11.4 Labeling Information

The following information is stated on the product label:

- Contains FCC ID: RI7LE910CXNF
- Contains FCC ID: UKM-SYS04240

5.12 Antennas List

The SYS-04240-23 has been certified with the following antennas:

Types	Manufacturer and Model	Peak Gain (dBi)
Wi-Fi/BT antenna	2J Antennas 2J6302MP	1.7 @ 2.4 GHz 2.3 @ 5 GHz
GNSS antenna	Taoglas AA.107.301111	-
Cellular antenna	Taoglas GSA.8827.A.101111	2.83 @ 700 MHz 1.71 @ 850 MHz 2.93 @ 900 MHz 2.67 @ 1800 MHz 3.32 @ 1900 MHz 3.43 @ 1900 MHz 1.67 @ 2500 MHz

NOTICE
Within the EU, antennas must be used in compliance with the RED requirements. **Within the US, antennas must be used in compliance with the FCC requirements.**

6 TECHNICAL SPECIFICATIONS

Specifications		Description
Processor	**CPU**	NXP i.MX6 QUAD CORE 800Hz,1GB DDR3, 4GB EMMC
Memory	**RAM**	1 GB DDR RAM
Storage	**Embedded**	4 GB eMMC
	Other	1x MicroSD slot available behind the Service Panel; Maximum MicroSD card size: 16 GB
Wired interfaces	**Ethernet**	1x 10/100 Ethernet port
Wireless interfaces	**WLAN**	2x SMA-RP antenna connector for 802.11a/b/g/n Wireless LAN Frequency: 802.11 b/g/n 2.4GHz Output power: • 17 dBm @ Wi-Fi 802.11b • 15 dBm @ Wi-Fi 802.11g • 9 dBm @ Wi-Fi 802.11n-HT20 • 9 dBm @ Wi-Fi 802.11n-HT40

	Cellular	2x SMA antenna connectors for 4G CAT 1 cellular modem
		
		Frequency bands:
		• LTE FDD (4G): B2, B4, B5, B12, B13, B14, B66, B71
		• HSA+ (3G): B2, B4, B5
		
		Data transfer rates:
		• LTE
		  ○ Uplink up to 5 Mbps
		  ○ Downlink up to 10 Mbps
		
		Output power:
		• Class 3 (0.2 W, 23 dBm) @ LTE

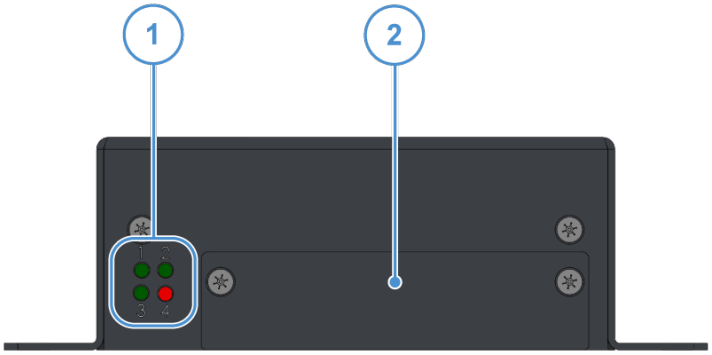
	GNSS	1x SMA antenna connector for GNSS receiver:
		
		• Sensitivity:
		  ○ Standalone or MS Based Tracking Sensitivity: -162.3 dBm
		  ○ Acquisition -157.5 dBm
		  ○ Cold Start Sensitivity -157.5 dBm
		• TTFF:
		  ○ Hot: 1.1s
		  ○ Warm: 22.1s
		  ○ Cold: 29.94s
		• Accuracy: 0.8m

Service panel interfaces (for maintenance only)	**USB**	1x USB 2.0 OTG port
	Console	1x RS-232 serial port
	Pushbutton	1x Reset pushbutton
LED indicators		1x Power: Green 2x User configurable: 1x Green, 1x Red 1x Modem activity: Green
Power	**Input**	Nominal voltage: 24 VDC Voltage range: 16.8 to 36 VDC The product is protected against reverse voltage, surge and over-voltage
	Consumption	15W maximum
	Earthing	Terminal for earth connection provided on the rear side
Temperature	**Operating**	-25°C to +70°C, +85°C for 10 minutes [ref. EN 50155 Class T3]

Specifications		Description
	Storage	-40°C to +85 °C
Certifications	**Regulatory**	CE, FCC
	Vertical	E-Mark, EN 50155 Class T3, EN 45545
	Safety	EN 62368
	Environmental	RoHS 3, REACH
	Ingress protection	IP20
Operating System		Linux distribution based on Yocto framework including the Eurotech Everyware Software Framework
Mechanical	**Enclosure**	Material: Aluminum Color: Black grey RAL 7021
	Dimensions	175 (L) x 152 (W) x 46 (H); mm (connectors and mounting brackets included)
	Weight	1.5 kg
	Mounting	Enclosure equipped with mounting brackets; required: 4x M3 screws

7 FRONT SIDE OVERVIEW

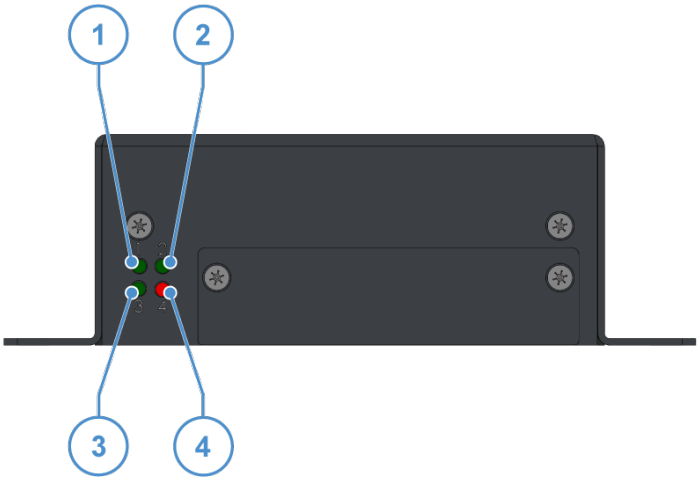
The following figure displays the front side of the product:



Ref #	Description
1	LED indicators
2	Service Panel

7.1 LED indicators

The following LED indicators are available on the front side of the product:



Ref #	Description	Type
1	Power	Green LED
2	User configurable	Green LED
3	Modem activity	Green LED
4	User configurable	Red LED

7.2 The Service Panel and the Service Interfaces

The Service Panel is available on the front side of the product and protects the Service Interfaces.

7.2.1 How to remove the Service Panel

NOTICE
The IP grade is not maintained when the Service Panel is removed. Do not use the product for extended periods of time with the Service Panel removed, otherwise dust and other particulates may enter the system. If it is necessary to have extended access to the Service Panel, take appropriate precautions to stop any particulates from entering.

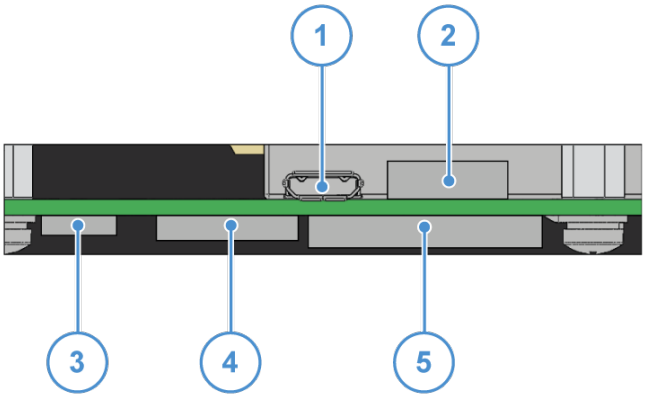
To remove the Service Panel, complete the following steps:

1. Remove the 2 screws that keep the Service Panel in place

2. Remove the Service Panel

7.2.2 The Service Interfaces

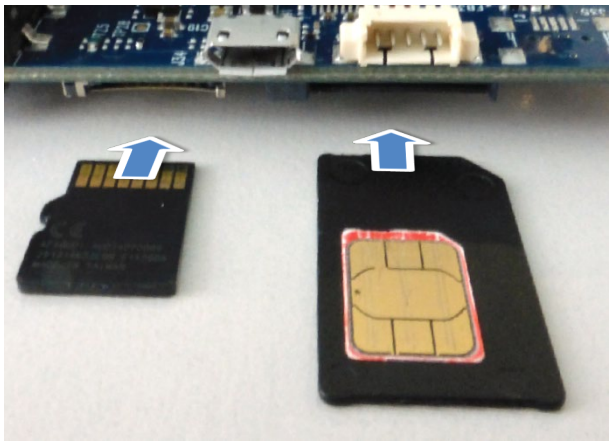
Once you have removed the Service Panel, the following Service Interfaces become available:



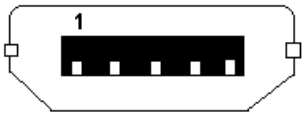
Ref #	Description
1	Maintenance USB 2.0 port
2	RS-232 console port for maintenance
3	Reset pushbutton: push it to trigger a hardware reset
4	MicroSD card push-push receptacle
5	Mini SIM card push-push receptacle

7.2.3 How to insert the MicroSD card and the Mini SIM card

Insert the cards in their push-push receptacles with the contacts facing upwards:



7.2.4 Maintenance USB 2.0 port: layout and pinout



Pin#	Signal	Description
1	VBUS	USB VBUS
2	D-	Negative data
3	D+	Positive data
4	OTG_ID	Host/Client detect
5	GND	Ground

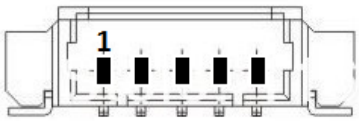
Connector Specifications:

- Micro USB type-B plug

Mating Connector Specifications:

- Micro USB type-B jack

7.2.5 RS-232 console port for maintenance: layout and pinout



Pin#	Signal	Description
1	GND	Signal ground
2	TX	Transmit data
3	RX	Receive data
4	Reserved	-
5	GND	Ground

Connector Specifications:

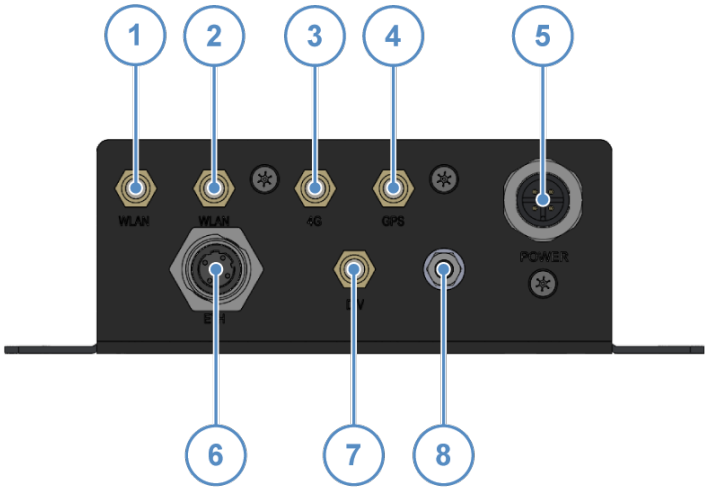
- SIL 1.25 pitch 5-pin (PicoBlade) header

Mating Connector Specifications:

- SIL 1.25 pitch 5-pin receptacle
- Example: Molex 51021-0500 (or equivalent)

8 REAR SIDE OVERVIEW

The following figure displays the rear side of the product:

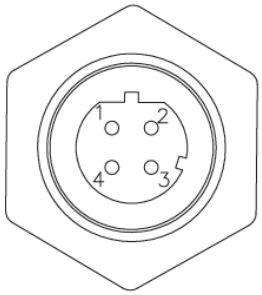


Ref #	Name	Description
1	WLAN	WLAN MIMO 2Tx2R antenna #1 connector
2	WLAN	WLAN MIMO 2Tx2R antenna #2 connector
3	4G	Main Cellular antenna connector
4	GPS	GNSS antenna connector
5	POWER	Power supply port
6	ETH	1x 10/100 Mbps Ethernet Port
7	DIV	Diversity Cellular antenna connector
8	Earth connection terminal	

8.1 Antennas Connectors

Name	Description	Connector type
WLAN	WLAN MIMO 2Tx2R antenna #1 connector	SMA-RP antenna connector
WLAN	WLAN MIMO 2Tx2R antenna #2 connector	SMA-RP antenna connector
4G	Main Cellular antenna connector	SMA antenna connector
DIV	Diversity Cellular antenna connector	SMA antenna connector
GPS	GPS antenna connector	SMA antenna connector

8.2 ETH Connector: layout and pinout



Pin#	Signal	Description
1	ETH_TX+	Positive TX pair
2	ETH_RX+	Positive RX pair
3	ETH_TX-	Negative TX pair
4	ETH_RX-	Negative RX pair

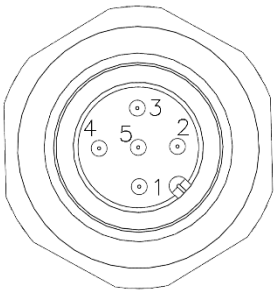
Connector Specifications:

- Panel-mount; M12 series
- Gender: Female
- Type: D- Coding; 4-pin

Mating Connector Specifications:

- Cable-Mount; M12 series
- Gender: Male
- Type: D- Coding; 4-pin
- Example: Conec 43-00161 (or equivalent)

8.3 Power Connector: layout and pinout



Pin#	Signal	Description
1	VIN+	Positive power input
2	VIN+	Positive power input
3	VIN-	Negative power input
4	VIN-	Negative power input
5	IGN	Ignition Key input

Connector Specifications:

- Panel-mount; M12 series
- Gender: Male
- Type: A- Coding; 5-pin

Mating Connector Specifications:

- Cable-Mount; M12 series
- Gender: Female
- Type: A-Coding; 5-pin
- Example:
  - Angled version: Conec 43-00098 (or equivalent)
  - Axial version: Conec 43-00114 (or equivalent)

8.4 Earth Connection Terminal

Always use this terminal to connect the product to an earth point in the installation. This terminal includes an M4 washer and an M4 lock nut.

Apply a tightening torque of 1.5 Nm.

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9 SOFTWARE SPECIFICATIONS

The SYS-04240-23 is equipped with:

- A Linux distribution based on Yocto framework
- The Eurotech Everyware Software Framework

The Linux distribution includes a networking stack and packages that provide:

- Routing services between Wireless LAN and cellular modem
- Access point functionality with two SSID’s
- Traffic shaping

The Eurotech Everyware Software Framework provides:

- Device Management functionality, based on Everyware Cloud
- Application bundle with diagnostic information on wireless LAN subsystem

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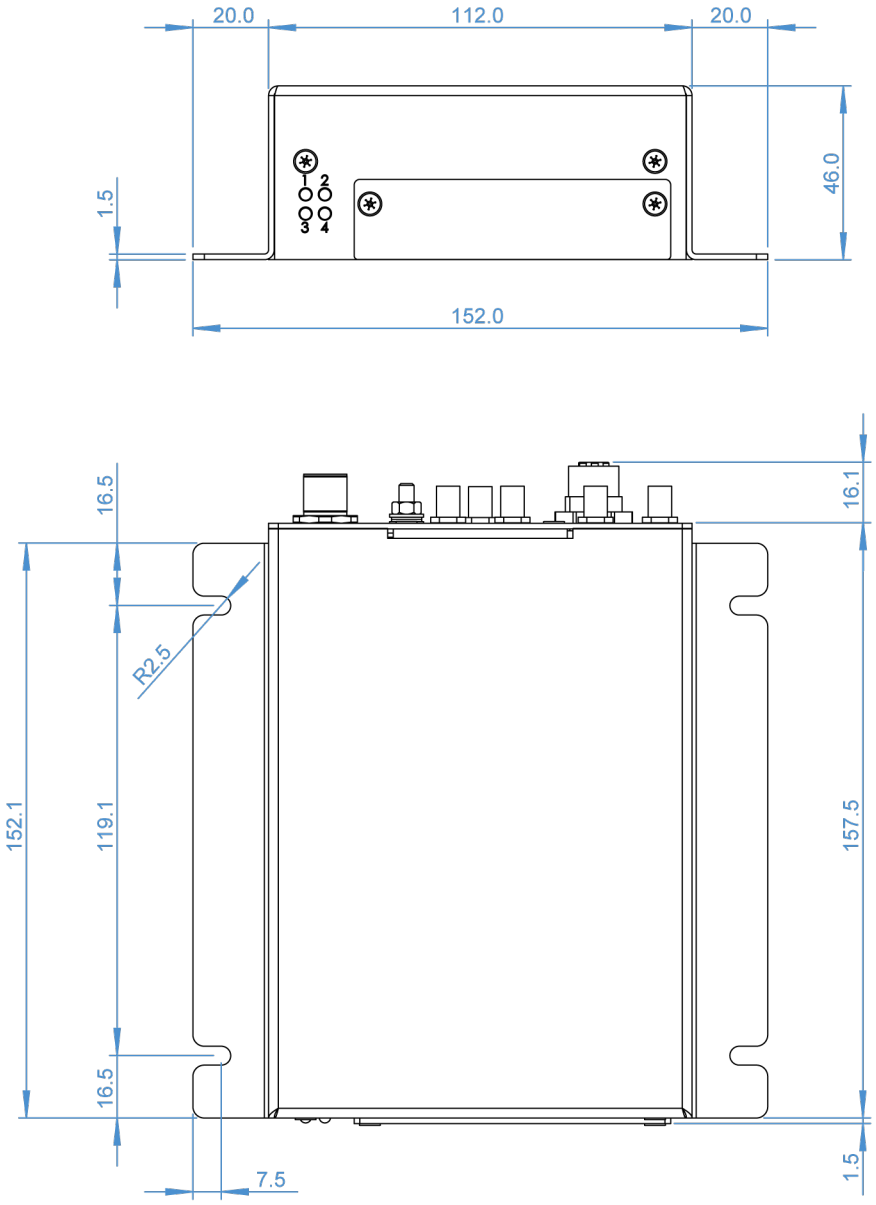
10 MECHANICAL SPECIFICATIONS

The enclosure has the following dimensions (in mm):



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11 HOW TO INSTALL THE PRODUCT

To install the product, complete the following steps:

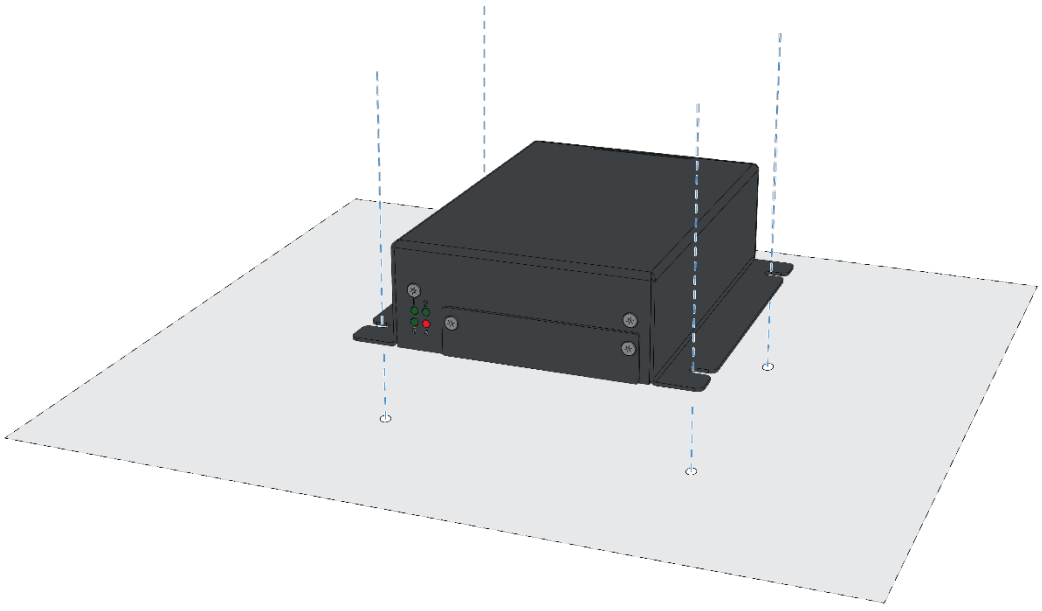
1. Mount the product in place
2. Connect all the required peripheral devices
3. Supply power to the product (turn ON/OFF the product)

11.1 How to mount the product in place

To mount the SYS-04240-23 in place, complete the following steps:

1. Use the mounting brackets to mount the product
2. Add all the necessary screws (for example: use 4x M5 screws) and locking parts to safely secure the SYS-04240-23 in place according to your installation requirements.
   Material, type, and length of the screws, and the maximum torque applicable, depend on your installation requirement
3. Make sure to leave at least 50 mm of free space around the SYS-04240-23 case to prevent overheating

For more information see Mechanical specifications on page 31.



11.2 How to connect all the required peripheral devices

Use only interconnecting and power cables that fulfil all the required standards.

Verify that the system or the external apparatus are switched OFF before connecting / disconnecting the cables.

Isolate or, if possible, remove all unused cables.

To maintain the IP protection grade, properly seal the connectors. Only use cables that guarantee an adequate cable-to-connector seal. Cover any unused connector with appropriate plugs. Cover a connector improperly may result in damage to the system or other components due to seal leakage.

Only connect devices that conform to the requirements of SELV circuits (Security Extra Low Voltage).

11.2.1 Notes about the USB connection

USB is a high-speed bus and is not ideally suited for harsh environments. Eurotech cannot ensure that a mass storage device or any other device that must be continuously connected and operating will work properly under severe disturbances.

Use the USB port provided behind the Service panel only for maintenance.

11.3 How to supply power to the product (turn ON/OFF the product)

The SYS-04240-23 provides the Power connector on the rear side.

The product is protected against reverse voltage, surge and over-voltage.

NOTICE

- **The SYS-04240-23 can be powered from batteries, using a voltage that fulfills the required standards and the technical specifications**
- **Always apply all the required protection devices against over-currents in compliance with the applicable standards.**

11.3.1 Before supplying power to the product

Before supplying power to the product, complete the following steps:

1. **Verify that the DC power source is turned OFF**
2. **Verify that the installation is made following all the required operating and safety instructions.**

11.3.2 How to safely connect power to the product

WARNING

ELECTRIC SHOCK HAZARD

Failure to supply power correctly or to follow all operating instructions correctly, may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely supply power to the product, complete the following steps:

1. **Observe all the instructions for safety, installation, and operation**
2. **Make sure your hands are dry**
3. **Make sure that all the cables used:**
   a. **Are in good condition before using them**
   b. **Meet the product requirements and comply with the relevant standards and regulations**
4. **Position cables with care. Do not position cables in places where they may be trampled or compressed by objects placed on them**
5. **Make sure that the power-points and plugs are in good condition before using them**
6. **Do not overload the power-points and plugs**
7. **Make sure that the product maintains a proper grounding connection. Always use the earth protection terminal to connect the product to an earth point in the installation: see also "Earth Connection Terminal" page 27**
8. **Use a power supply that meets the product requirements and complies with the relevant standards and regulations. In case of uncertainties, contact the Eurotech Technical Support Team (for more information see "How to receive technical assistance" on page 9)**
9. **Connect power after the installation of the system has been completed**
10. **Never connect or disconnect the cables with the system or the external apparatus switched ON.**

11.3.3 Power supply and Ignition Key input specifications

The SYS-04240-23 provides the Power connector on the rear panel.
The Power connector also includes the signal for the Ignition Key input.

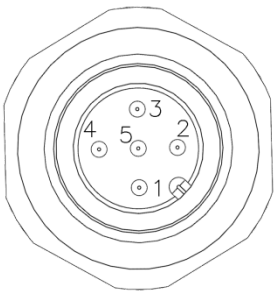
The Ignition Key input is developed to be connected to the vehicle ignition key to turn ON/OFF the product according to the following table:

Power supply	Nominal voltage: 24 VDC Voltage range: 16.8 to 36 VDC The product is protected against reverse voltage, surge and over-voltage
Ignition Key input (IGN)	Voltage level = VIN+ → Key ON → The SYS-04240-23 turns ON Voltage level = 0V → Key OFF → The SYS-04240-23 turns OFF after a programmable timeout Note: If you do not use the vehicle ignition key to manage the Ignition Key input, connect the IGN signal to VIN+
Power Consumption	15W maximum

11.3.4 How to supply power and turn ON the SYS-04240-23

To supply power and turn ON the SYS-04240-23, complete the following steps:

1. Set up a DC power source that meets the SYS-04240-23 power requirements (check the input voltage as close as possible to the Power IN connector. This is to compensate for any cable losses, caused by cable length and other cable characteristics)
2. Verify that the DC power source is turned OFF
3. Verify that all the required peripheral devices and the network cable are connected
4. Verify that the earth terminal is connected to an earth electrode
5. Connect the Power connector according to the following table



Pin#	Signal	Description
1	VIN+	Positive power input
2	VIN+	Positive power input
3	VIN-	Negative power input
4	VIN-	Negative power input
5	IGN	Ignition Key input

6. Verify that the installation is made following all the required operating and safety instructions
7. Turn the DC power source ON and turn the Key ON. The SYS-04240-23 will turn ON (the Power ON LED will light up)

11.3.5 How to turn OFF the SYS-04240-23

The turning OFF procedure is managed via software. For more information see How to turn ON/OFF the modem on page 38.

12 HOW TO MANAGE THE PRODUCT

12.1 How to login the Administration Console

12.1.1 Default credentials

The default credentials are the following (case sensitive):

- Username: **root**
- Password: **eurotech**

12.1.2 How to perform the login

To perform the login, use either:

- The maintenance serial port available in the Service Panel (`/dev/ttymxc1`)
- A secure shell on the Ethernet ETH port (`eth0` configured in DHCP)

12.2 How to get the power supply status

To get the power supply status, use the file `/sys/class/gpio/vin-ready/value`:

- Value = '1' means Vin > 9 VDC (power supply ON)
- Value = '0' means Vin < 9 VDC (power supply OFF)

NOTICE

The `vin-ready/value` must be monitored by the application software.

During the signal transition period from 1 to 0, the full power remains available for 50 ms only.
All disk operations must be closed safely within this time.

12.3 How to manage the LED indicators

The SYS-04240-23 exposes the LED Indicators as follows:

LED #	LED color	Linux Device	Linux Device Value
2	Green	`/sys/class/gpio/led0-green/value`	'1' means LED ON '0' means LED OFF
4	Red	`/sys/class/gpio/led0-red/value`	'1' means LED ON '0' means LED OFF

You can manage LED 2 and LED 4 only. Other LED indicators are reserved.

12.4 How to manage the modem

The modem has 7 serial ports: `/dev/ttyUSB[0..6]`
(for more information see: Telit_HE910_UE910_Family_Ports_Arrangements_r6.pdf user manual)

To communicate with the modem, use the serial port `/dev/ttyUSB2`

12.4.1 How to turn ON/OFF the modem

To switch the modem ON/OFF, use the file `/sys/class/gpio/modem-enable/value`:

- Value '1' means switch ON
- Value '0' means switch OFF

12.4.2 How to reset the modem

To reset the modem, use the file `/sys/class/gpio/modem-reset/value` and complete the following steps:

1. Set the reset signal to '1"

   ```
   Echo 1 >/sys/class/gpio/modem-reset/value
   ```

2. Wait for 1 second

   ```
   Sleep 1
   ```

3. Set the reset signal to '0' (the default value)

   ```
   Echo 0 >/sys/class/gpio/modem-reset/value
   ```

12.5 How to turn OFF the product

To turn OFF the product, complete the following steps:

1. Login the Administration Console
2. Enter the command `poweroff`. The product turns OFF
3. Remove the power from the Power connector.

13 HOW TO MAINTAIN THE PRODUCT

Periodically inspect the installation of the product to verify its integrity and to ensure proper operation.

To maintain the product, complete the following steps:

1. Carefully read and understand the instructions contained in the section "Safety instructions" on page 5
2. Safely remove the power supply
3. Verify the installation of the product
4. Clean the product

13.1 How to safely remove the power supply

WARNING

ELECTRIC SHOCK HAZARD

Failure to remove power correctly may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely remove power supply from the product, complete the following steps:

1. **Make sure your hands are dry**
2. **Turn OFF all the power supply sources**
3. **Disconnect all the cables**
4. **Make sure that all the circuits are discharged**

13.2 How to verify the installation of the product

To verify the installation of the product, complete the following steps:

1. Verify that the product is clean and not damaged
2. Verify that the LED indicators are visible and not damaged
3. Verify that all the screws, bolts, nuts are correctly fastened
4. Verify that the product is installed correctly.

13.3 How to clean the product

To clean the product, complete the following steps:

1. Never use detergents, aerosol sprays, solvents or abrasive sponges
2. To remove dust from the case of the product, use a dry, lint-free, cloth
3. To remove the dirt, use water-based, non-flammable, cleaner products.

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NOTES

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