Regesta Smart v2 Nessum

Installation Manual

Legal Notice

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Table of Contents

Chapter 1 About This Manual

This installation manual provides detailed instructions for setting up the Regesta Smart v2 Nessum router and offers guidance on installing the device in a working environment.

1.1 Supported Devices

The content in this manual applies specifically to the **Regesta Smart v2 Nessum** Series routers.

1.2 Who Should Read This Manual?

This manual is designed for individuals who are installing and configuring the Regesta Smart v2 Nessum router for the first time. Installers should have a basic understanding of network structures, terminology, and concepts.

1.3 When Should You Refer To This Manual?

Read this guide as soon as you are ready to familiarize yourself with the device and its components.

By reading this manual, you will gain a comprehensive understanding of your new device.

1.4 What's Included in This Manual?

The installation guide covers the following information:

- A description of the features available in the Regesta Smart v2 Nessum.
- Technical specifications.
- Power supply requirements.
- Detailed descriptions of the device's LEDs and connectors.
- Troubleshooting tips.

1.5 What Is Not Covered in This Manual?

This document does not include information about the device's software or its configuration. For guidance on configuring the device, please refer to the relevant protocol manuals available on the Teldat website:

http://www.teldat.com

1.6 How Is the Information Structured?

The information in this manual is organized into chapters, with each chapter focusing on a specific aspect of the hardware and its components. Detailed descriptions, technical specifications, and relevant information for each component are provided in their corresponding chapters.

1.7 Risk Identification

WARNING: This signal term is used to highlight potentially hazardous situations that, if ignored, could lead to serious injury or loss of life.

1.8 Safety Warnings

This device must be installed in restricted access locations by qualified and trained personnel, as described in this installation guide.

Este dispositivo debe ser instalado en lugares de acceso restringido por personal cualificado y entrenado, como se describe en esta guia de instalación.

This device is designed to operate in an extended ambient temperature range of up to 70 °C (158 °F). Under these conditions, its surface may reach temperatures that could cause injury.

Este equipo ha sido diseñado para funcionar con una temperatura ambiente de rango extendido de hasta 70 ºC (158 ºF) y bajo estas condiciones la superficie puede alcanzar temperaturas que pueden causar daños.

The voltage in power cables, telephone line cables, and communication cables is dangerous. To prevent electric shock, follow the specified order in the *Connecting* on page 20 and*Disconnecting* on page 20 sections when installing, moving, or opening this device.

La tensión eléctrica de los cables de alimentación, de los cables de la línea telefónica y de los cables de comunicación es peligrosa. Para evitar descargas, antes de instalar, mover o abrir las cubiertas de este equipo, conecte y desconecte los cables siguiendo el orden que se detalla en los apartados "*Conectar*" y "*Desconectar*".

The device may have multiple power sources. Make sure to disconnect all connections when turning off the device.

El equipo podría tener mas de una fuente de alimentación. Asegurese de que todas las conexiones han sido desconectadas cuando apague el equipo.

The protective cover must be reattached before connecting the device to the power supply.

Se deberá volver a colocar la cubierta protectora antes de conectar el dispositivo a la alimentación.

The router does not come with a power cable. The maximum consumption at 230 V AC is approximately 100 mA. Any cable with a cross-sectional area of 0.75 mm2 (AWG18) or larger, and compliant with IEC 60227, is suitable.

El cable de alimentación no se suministra con el router. El consumo máximo a 230 V AC es de, aproximadamente, 100 mA. Cualquier cable con una sección mayor o igual a 0,75 mm2 (AWG 18) y aprobado por la IEC 60227 es válido.

All interconnected communication devices should be connected to the SAME GROUND POINT, ideally with a resistance of less than 10 ohms.

If the installation includes an Uninterruptible Power Supply (UPS) or a regulated power supply, or operates independently of other power systems (like lighting), connect all communica-

	tion equipment to the same power source. This will help prevent operational issues and premature wear of drivers and other components.
	Todos los equipos de comunicaciones interconectados deberán estar unidos a UNA MISMA TOMA DE TIERRA, a ser posible de buena calidad (inferior a 10 ohmios). Si la instalación está dotada de un Sistema de Alimentación Ininterrumpida (SAI), alimentación estabilizada, o bien es independiente del resto (alumbrado, etc.), conecte todos los equipos de comunicaciones a la misma fuente de alimentación. Así, se ahorrará problemas de funcionamiento y envejecimiento prematuro de drivers y demás componentes.
	Laser Radiation. Avoid direct exposure with optical instruments. CLASS 1 LASER PRODUCT. SFP modules installed in the card slot must be class 1 devices in accordance with IEC/EN 60825-1:2007.
	Radiación laser. No mirar directamente con instrumentos ópticos. Producto LASER CLASE 1. Los módulos SFP que se instalen en el socket de la tarjeta deben ser dispositivos de CLASE 1 de acuerdo con la norma IEC/EN 60825-1:2007.
	Never install SIM cards while the device is powered on. Always disconnect the device from the main power supply before installing the SIM cards. Ensure the device is disconnected before removing the casing to access the trays. When inserting SIM cards, take precautions against electrostatic discharge (ESD). Avoid touching the SIM card connectors.
	No instale nunca las tarjetas SIM con el equipo encendido. Desconecte siempre el equipo de la red antes de instalar las tarjetas SIM. Desconecte siempre el equipo antes de desmontar la carcasa para acceder a las bandejas. Al insertar las tarjetas SIM, protéjase contra descargas electroestáticas (ESD). No toque los conectores de las tarjetas SIM.
	The screws should be secured in a wall anchor (wooden) or an appropriate type suited to the wall material. Screws installed directly into drywall lack the necessary strength to support the router.
	Los tornillos deben ir atornillados en un taco de pared (de madera) o del tipo adecuado según la clase de pared. Los tornillos que se montan directamente en los paneles de yeso no son lo bastante resistentes para soportar el router.
	The Regesta Smart v2 Nessum is a permanently connected Class II device. To ensure compliance with electrical safety regulations, the device must be connected to the power supply via a CE-marked thermomagnetic circuit breaker of up to 16 A. When it comes to industrial environments, it must comply with EN 60947-2. For better safety, opt for a bipolar type.

	El Regesta Smart v2 Nessum es un equipo de Clase II permanentemente conectado. Para cumplir con las normas de seguridad eléctrica en materia de sobrecargas, este equipo deberá conectarse a la fuente de alimentación a través de un interruptor magnetotérmico de hasta 16 A que cuente con marcado CE. En entornos industriales debe de cumplir con EN 60947-2. Para mayor seguridad debe ser de tipo bipolar.

1.9 Related Documentation

Teldat Dm704-I *Configuration and Monitoring*

Teldat Dm709-I *LAN Interfaces*

Teldat Dm712-I *SNMP Agent*

Teldat Dm781-I *Cellular Interface*

Teldat Dm748-I *Software Updating*

Teldat Dm753-I *Syslog Client*

Teldat Dm1092-I *Nessum Interface*

1.10 Technical Support

Contact information:

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Chapter 2 Product Overview

This chapter provides an overview of the features of Regesta Smart v2 Nessum routers and their components. It includes information on:

2.1 General Description

The Regesta Smart v2 Nessum router family is designed to perform reliably in demanding and extreme environments. With its rugged construction and specialized features, these routers can withstand harsh temperatures, making them ideal for industrial applications, telecontrol systems, and distribution networks for electricity, gas, water, and more.

The primary function of this router family is to act as a BPL (Broadband PLC) gateway in electrical substations and transformation centers. The version with BNC connectors is intended for use in substations, where it injects Nessum signals into medium voltage lines via external couplers. The low voltage version, which lacks BNC connectors, injects Nessum signals directly into the AC line through its power connector.

Featuring a versatile modular design, this device adapts easily to the latest WWAN technologies. It supports various wireless technologies, including GPRS, EDGE, UMTS, HSDPA, HSUPA, HSPA+, and LTE, and accommodates two SIM cards—one for active use and the other as backup.

For LAN networks, the device includes two 10/100/1000 Base-T Ethernet ports.

Additionally, the RS-232 console port functions as a DCE asynchronous serial communications port (supporting speeds of up to 115200 bps without control signals). The serial port connection is enabled via a convenient, pluggable RJ45 connector.

To ensure safety, the device features a protective casing that prevents accidental contact with the connectors while the device is in operation.

Fig. 3: Regesta Smart v2 Nessum

2.2 Device Models

The table below details the various available models of the Regesta Smart v2 Nessum router. Two of these models feature BNC connectors to inject Nessum signals into medium voltage lines, while the other two models inject Nessum signals into low voltage lines via their power supply connector. The medium voltage models are equipped with a multi-range power supply, allowing them to connect to both AC and DC sources. In contrast, the low voltage models are designed to only connect to AC power supplies.

Regesta Smart v2 Nessum models

Code **(Regulatory model)**	**Description**
RWRBHNZLV (TLDPH18D2)	Regesta Smart v2 Nessum LOW Voltage: 2 LAN Gigabit Ethernet ports, 1 SFP socket, 1 RS232, AC powered (110 - 240 VAC).
RWRBHNLLV (TLDPH19D2)	Regesta Smart v2 Nessum LOW Voltage: 2 LAN Gigabit Ethernet ports, 1 SFP socket, 1 RS232, 1xWWAN (Bands: LTE 1, 3, 5, 7, 8, 20, 38, 40, 41 - WCDMA 1, 5, 8 - GSM 3, 8), AC powered (110 - 240 VAC).
RWRBHNZMV (TLDPH16D2)	Regesta Smart v2 Nessum MEDIUM Voltage: 2 LAN Gigabit Ethernet ports, 1 SFP socket, 1 RS232, 2xBNC Nessum connectors, MultiRange power input (48 - 72 VDC, 110 - 240 VAC).
RWRBHNLMV (TLDPH17D2)	Regesta Smart v2 Nessum MEDIUM Voltage: 2 LAN Gigabit Ethernet ports, 1 SFP socket, 1 RS232, 2xBNC Nessum connectors, 1xWWAN (Bands: LTE 1, 3, 5, 7, 8, 20, 38, 40, 41 - WCDMA 1, 5, 8 - GSM 3, 8), MultiRange power input (48

	- 72 VDC, 110 - 240 VAC).

2.3 Hardware Features

The following information outlines the hardware features of the Regesta Smart v2 Nessum router.

- PWR: External Power Input.
  - 2-Pole 5.08 mm Pitch Terminal Block Connector.
  - AC Power
    - Nominal: 110 - 240 V AC.
    - Absolute: 85 - 264 V AC.
    - Frequency : 50 - 60 Hz.
    - Power: 10 W.
  - MR Version ("MR" models)
    - Nominal: 110 - 240 V AC, 48 - 72 V DC
    - Absolute: 85 - 264 V AC, 40 - 85 V DC
    - Frequency : 50 - 60 Hz (V AC)
    - Power: 10 W
  - Dying Gasp Alarm to alert users of power failures or disconnections of the power supply cable. Please note that an additional accessory is required to activate this feature.
- LAN1: Gigabit Ethernet RJ45 connector:
  - The RJ45 connector supports IEEE802.3 Ethernet standards for copper wiring, including 10Base-T, 100Base-TX, and 1000Base-T.
- LAN2: Gigabit Ethernet RJ45 connector:
  - The RJ45 connector supports IEEE802.3 Ethernet standards for copper wiring, including 10Base-T, 100Base-TX, and 1000Base-T.
- SFP/LAN3: Gigabit Ethernet SFP socket:
  - SFP port supports the 1000Base-X Fiber Ethernet standard using SFP modules.
- CONF: Console Serial Port.
  - 1xRJ45 connector RS-232 port (DCE).
- WWAN: Depending on the model. ("L" models)
  - 1xLTE Category 4 WWAN module with two SMA connectors.
  - 2 Internal SIM trays with 2FF form factor.
- RST: External Reset/Recovery push button

2.4 Components

2.4.1 Front Panel

The front panel is equipped with several LEDs that indicate the device's operating status.

Check the figure below for a detailed view of the front panel layout.

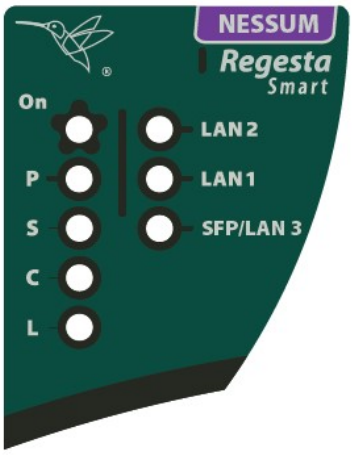


Fig. 4: **Front Panel**

During startup, LED **L** will light up in green. Once the device has booted, the LEDs will indicate the following:
LEDs

LED	Associated Interface	Status	Description
ON	Power	Off	Device is not powered on.
		Green	Device is powered on.
P	Nessum interface	Off	Nessum interface is disabled, unavailable, or not installed.
		Red	Nessum is operating in TERMINAL mode but is notconnected or registered to any Master device.
		Amber	Nessum is operating in MASTER mode with no registered terminals.
		Green	Nessum is operating in MASTER or TERMINAL mode with an establishedconnection. Data traffic can be transmitted throughthe Nessum interface. • Steady: No data transfer is occurring. • Flashing: Data is being transferred.
S	Cellular interface	Green	SIM1 operating SIM. This indicates that traffic is being processed through the carrier for the SIM installed in this slot.
		Amber	SIM2 operating SIM. This indicates that traffic is being processed through the carrier for the SIM installed in this slot.
C	Cellular interface	Red	Cellular interface status: Unavailable, not installed, or not registered.
		Amber	The device is registered in the network and is establishing the PDP connection.
		Green	The device is registered, the PDP connection is established, and IP traffic can be transmitted through the CELLULAR interface. • Steady: No data transfer is occurring. • Flashing: Data is being transferred.
L	Cellular interface corresponding to	Off	Cellular interface is not active.

	the active SIM.	Red Amber Green	Coverage level below -100dBm. Coverage level between -90dBm and -100dBm. Coverage level above -90dBm.
LAN1	Ethernet LAN interface (RJ45)	Off Green	Ethernet LAN1 is either disabled or not connected. The Ethernet connection (link) is established: • Steady: No data transfer is occurring. • Flashing: Data is being transferred.
LAN2	Ethernet LAN interface (RJ45)	Off Green	Ethernet LAN2 is either disabled or not connected. The Ethernet connection (link) is established: • Steady: No data transfer is occurring. • Flashing: Data is being transferred.
SFP/ LAN3	Ethernet LAN interface (SFP)	Off Green	The SFP module is not in use. The Ethernet SFP connection (link) is established.

Please be aware that the behavior of certain LEDs may vary or some may not be present, depending on the device model or its configuration.

2.4.2 Connector Panel

To access the connector panel, you will need to remove the protective case covering it. For detailed instructions on removing or installing the protective cover, please refer to the section titled *Removing/Installing the Connector Protector* on page 13.

The figure below illustrates the connector panel, which includes all the connectors available on the Regesta Smart v2 Nessum router.

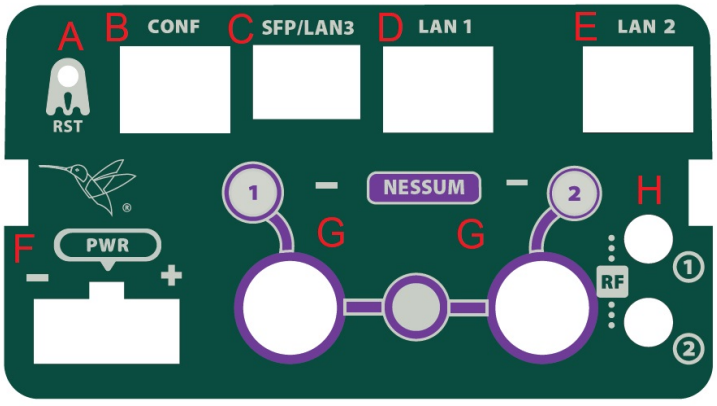


Fig. 5: **Connector Panel**

The connector panel elements are as follows:

Front Panel Elements

Item	Description
A	RST. Reset button. For further details on the functionality of the reset button, please see *RST Button* on page 26.
B	CONF. RJ45 connector providing access to the device's local console for configuration and monitoring purposes. This connector can also be used as an RS-232 asynchronous DCE serial port.

	For more information about the CONF connector, please refer to: - *Console Connector as Serial Port (CONF Connector)* on page 24. - *Configuration Connector* on page 33. - *Configuration Interface* on page 35.
C	SFP/LAN3 Gigabit Ethernet SFP socket. For more information about the WAN interface SFP socket, please refer to: - *SFP/LAN3 Connection* on page 20 - *SFP/LAN3 Socket* on page 32 - *SFP/LAN3 Interface* on page 34
D	LAN1 Gigabit Ethernet port. For more information about the LAN interface, please refer to: - *LAN1 and LAN2 Connection* on page 20. - *LAN1 and LAN2 Connectors* on page 32. - *LAN1 and LAN2 Interfaces* on page 34.
E	LAN2 Gigabit Ethernet port. For more information about the LAN interface, please refer to: - *LAN1 and LAN2 Connection* on page 20. - *LAN1 and LAN2 Connectors* on page 32. - *LAN1 and LAN2 Interfaces* on page 34.
F	POWER. Power connection and Nessum signal injection for low voltage models. For details on power connection options, please refer to: - *Power Source* on page 18. - *Power Supply Specifications* on page 35. For information on Nessum connection options, refer to: - *Nessum Connection* on page 21. - *Nessum Interface* on page 34.
G	Nessum. Two BNC connectors for injecting Nessum signals into medium voltage lines. For more information about the Nessum connection options, refer to: - *Nessum Connection* on page 21. - *Nessum BNC Connectors* on page 33. - *Nessum Interface* on page 34.
H	RF/WWAN antenna connectors for the Cellular interface, depending on the model. For more information about the Cellular interface, please refer to: - *WWAN Antenna Connections (RF Connectors)* on page 22.

	- *WWAN/RF Connectors* on page 32. - *Wireless WAN Interface* on page 35. For more information about SIM installation for the Cellular interface, please refer to *Installing the SIM Card* on page 24.

2.4.3 Underside Panel

The underside panel features the router identification label and various perforations for different mounting options. The figure below provides a detailed view of this panel:

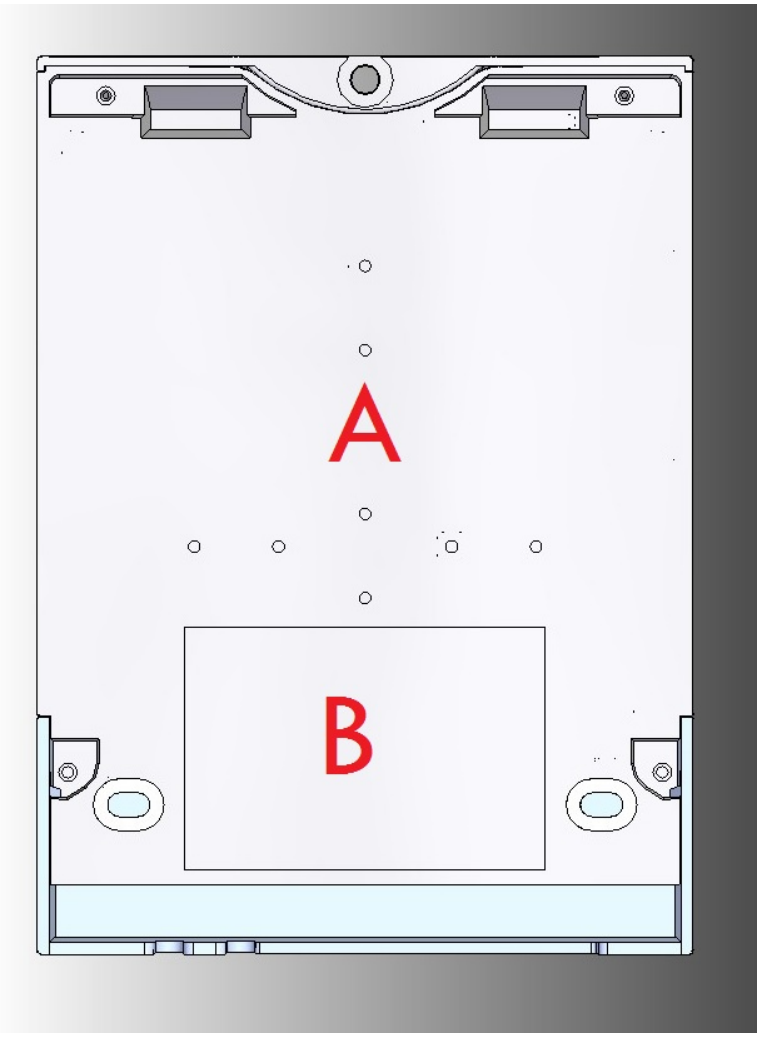


Fig. 6: **Underside Panel**

The underside panel includes the following elements:
Underside Panel Components

Item	Description
A	Slots for the accessories to attach the device to a DIN rail mount. For further information on this accessory, please see the section titled *Wall Mounting* on page 16 .
B	The platform on which the product information label is affixed. This label contains details such as the device model, MAC address, serial number, and more.

2.5 Power Supply

The Regesta Smart v2 Nessum offers three distinct power supply options, depending on the specific model.

Note

Please ensure that you have identified your router model and carefully read the instructions before connecting the router.

2.5.1 AC Power Supply

The Regesta Smart v2 Nessum AC version is powered by an external AC power source, supporting nominal voltages of 110-240 V AC.

2.5.2 Multi-Range (MR) Power Supply

The Regesta Smart v2 Nessum MR version supports both DC and AC power sources, with nominal voltages of 110-240 V AC and 48 V DC.

2.5.3 Dying Gasp Option

The Regesta Smart v2 Nessum can be enhanced with an optional Dying Gasp board, which can send an alarm signal in case of power failures or if the power supply cable is removed.

Chapter 3 Installing the Router

This chapter describes the steps to successfully install the Regesta Smart v2 Nessum router. It is divided into the following sections:

3.1 Workplace Conditions

Warning

This equipment must be installed in restricted access areas. Only trained and qualified personnel should install, replace, or service this equipment, following the instructions outlined in this installation guide.

- Avoid placing the device among papers, magazines, or other objects that may impede natural air circulation.
- Prevent knocks and strong vibrations during transport, operation, and storage to avoid potential damage.

Warning

Electricity in power, telephone, and communication cables can be dangerous. To prevent electric shocks, follow safety precautions before installing, handling, or opening equipment covers. Always adhere to the procedures outlined in the sections *Connecting* on page 20 and*Disconnecting* on page 20.

3.2 Removing/Installing the Connector Protector

The Regesta Smart v2 Nessum includes a protective case for the connectors to prevent accidental electrical discharges. When the protective case is in place, direct contact with the connectors is avoided during use.

Warning

This unit may have multiple power supply connections. Ensure that all connections are disconnected before turning off the device.

Follow these steps to remove the protective case covering the connectors.

Find the fastening mechanism located in the middle of the front panel. Rotate the fastening mechanism 90º to the left or right to bring it to a vertical position.

Refer to the following figures for visual instructions on how to remove the protective case from the device:

Fig. 7: **Removing the Protective Case**

Slide the case up as shown below:

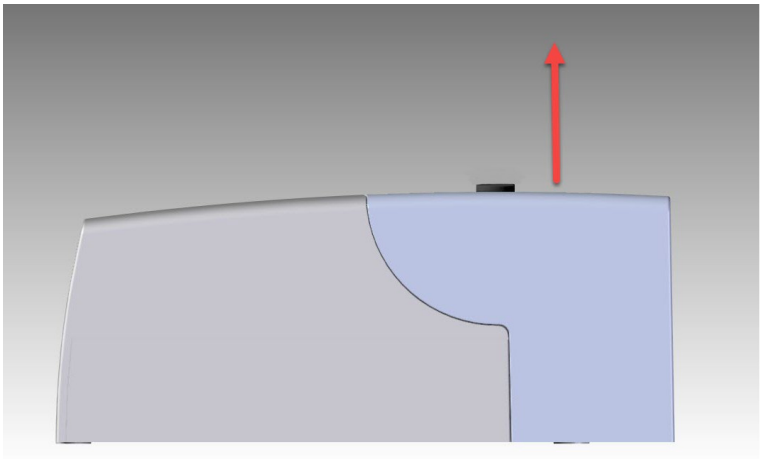


Fig. 8: **Sliding the Case Up**

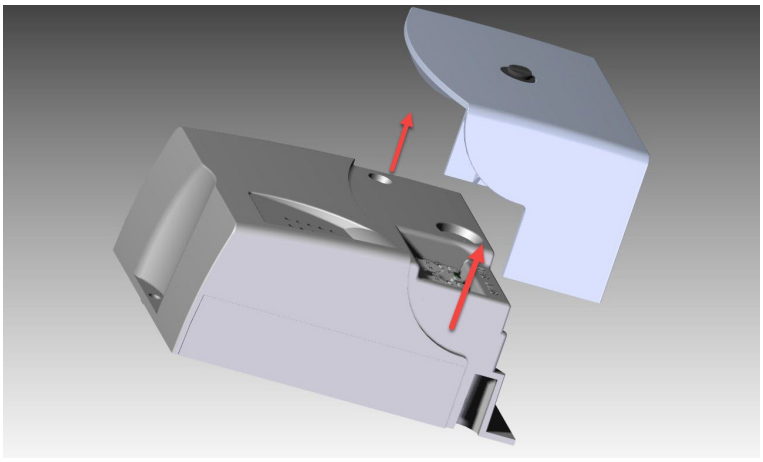


Fig. 9: **Lifting the Protective Case**

To reattach the protective case, follow these instructions:

Slide the case back down into its original position:

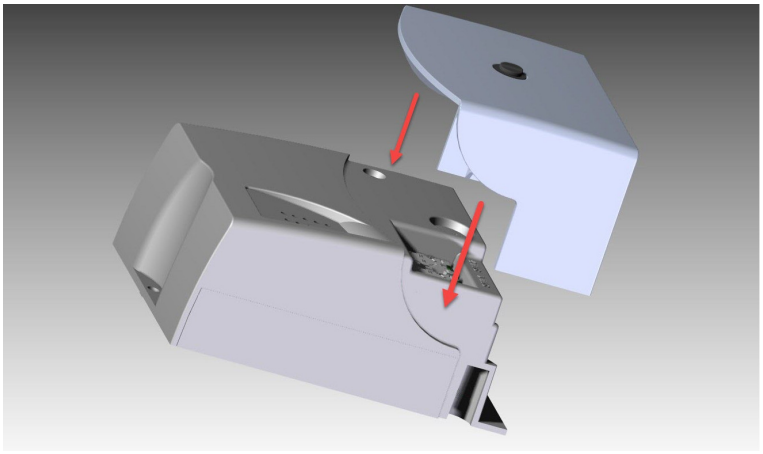


Fig. 10: **Replacing the Protective Case**

Lock the case in place by rotating the fastening mechanism back to a horizontal position and gently pushing down until you hear a clicking sound.

Warning

Please ensure that the protective casing for the connectors is installed before powering on the device.

3.3 Installing a DIN Rail Mount Accessory

The Regesta Smart v2 Nessum can be easily installed on a standard DIN rail using the included mounting kit.

This kit provides all necessary components, including two screws for securely attaching the rail mount to the device. The underside of the device has strategically placed holes that allow for flexible positioning of the DIN rail mount in two possible positions:

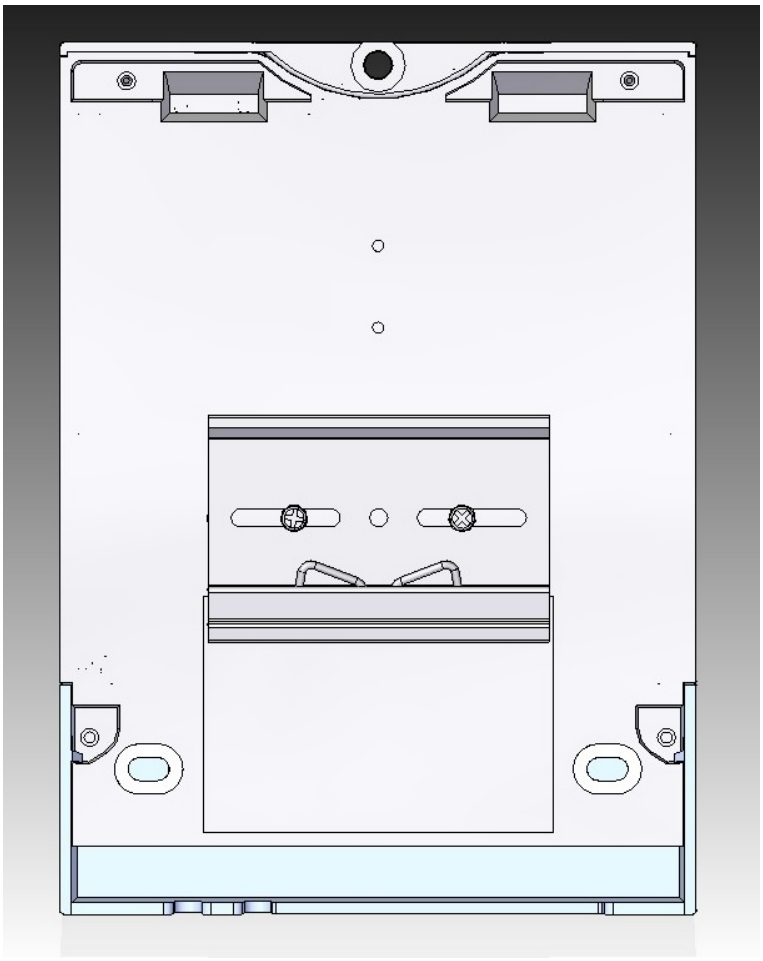


Fig. 11: **DIN Rail Mount: Position 1**

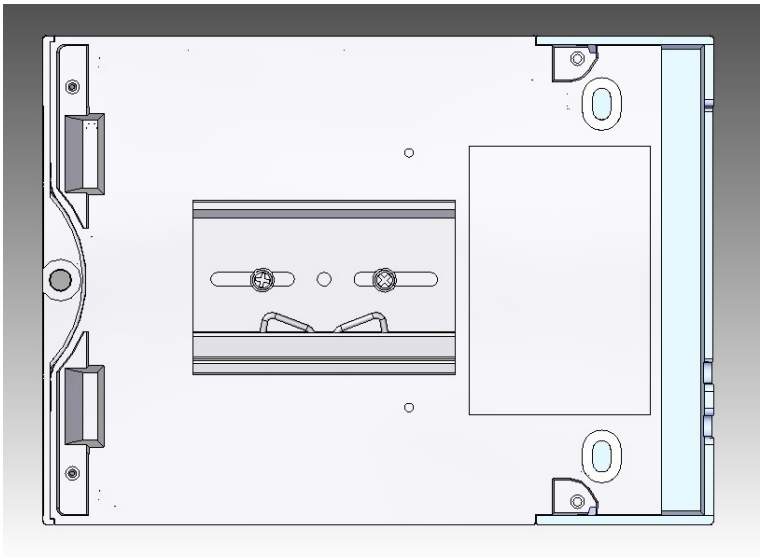


Fig. 12: **DIN Rail Mount: Position 2**

3.4 Wall Mounting

For wall mounting, the Regesta Smart v2 Nessum comes with three dedicated mounting holes. To ensure a secure installation, screws should be inserted into these holes. Before attaching the device to the wall, make sure to remove the protective casing.

For precise details on the placement of the fastening holes, please refer to the image below:

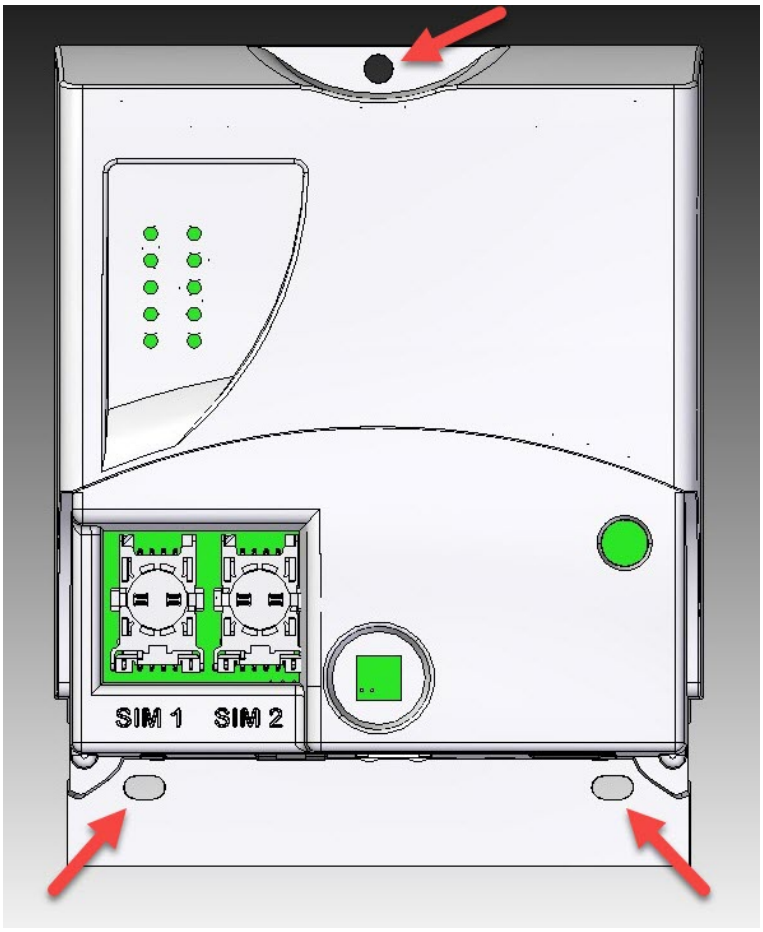


Fig. 13: Holes for Wall Mounting.

Chapter 4 Connecting the Router

This chapter offers a comprehensive guide for connecting the Regesta Smart v2 Nessum router to Ethernet devices and networks. It is divided into several sections for easy navigation and clarity:

4.1 Power Source

Note

Before connecting the router, please take the time to thoroughly read and follow the instructions outlined below.

4.1.1 Power Connector Pins

The power connector can be found on the router's connector panel.

Fig. 14: **Power Supply Connector**

Depending on the model, the Regesta Smart v2 Nessum can be powered by either DC or AC.

Note

Ensure that the power requirements of your device match the power source.

The router uses a **5.08 mm pitch 2-wire terminal block for its power connection**.

This connector features two terminals, designed for both AC power (in the AC or AC-powered MR models) and DC power (in DC or DC-powered MR models).

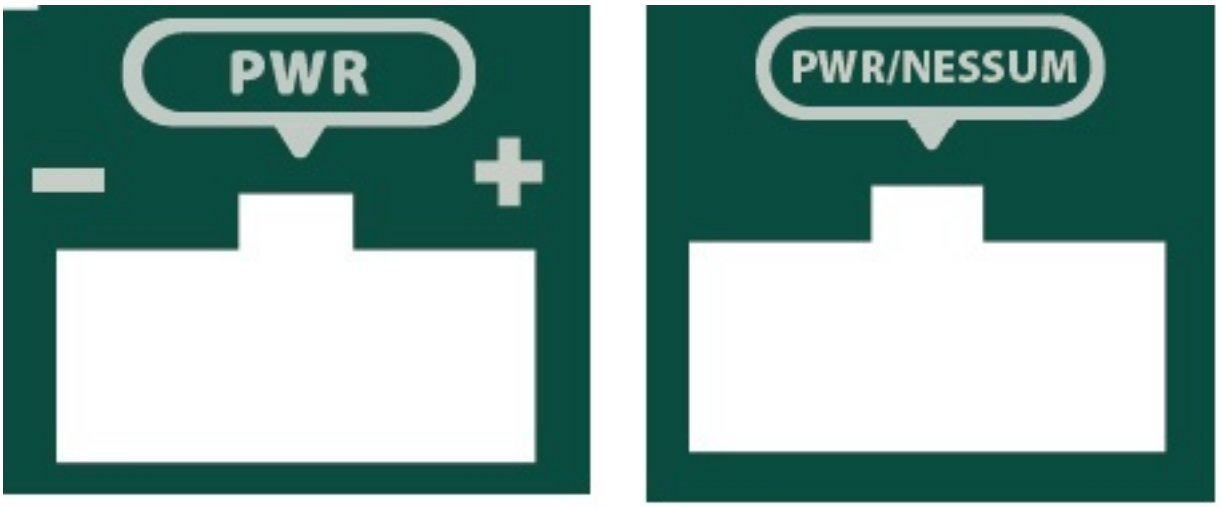


Fig. 15: **Power Supply Connector Detail** *(MV and LV versions)*

4.1.1.1 DC-Powered Device

PIN	Signal
-	- V DC
+	+ V DC

4.1.1.2 AC-Powered Device

PIN	Signal
	Neutral
	Phase

4.1.2 Power Connector Cable

Warning

The router does not include a power cable. For 230 V AC operation, the estimated peak power consumption is 100 mA. You may use any power cable with a conductor gauge of 0.75 mm2 (AWG18) or larger, provided it is IEC 60227 certified.

Warning

All AC-powered interconnected communication devices must be connected to the SAME GROUNDED POWER OUTLET. The power outlet should be of high quality with a resistance of less than 10 ohms. For DC-powered models, the power distribution system must be confined to a single building and grounded at a single point. This grounding requirement may be waived if the cabling for the DC power distribution system is less than 4 meters long or fully enclosed in a metal conduit.

It is strongly advised to connect all data devices to the same power source, regardless of whether the workplace is equipped with an Uninterruptible Power Supply (UPS), a regulated power supply, or is independent of other power systems (such as lighting). Doing so helps to avoid malfunctions and premature wear of drivers and other components.

4.1.3 Connecting

- Ensure that the power supply is NOT connected to either the electricity outlet or the router.
- First, connect all data cables.
- Next, connect the power supply cable to the device.
- Install the protective case over the connectors.
- Finally, plug the power supply cable into the electric outlet.

4.1.4 Disconnecting

- Disconnect the power supply from the electricity supply.
- Remove the protective case.
- Disconnect the power supply from the router.
- Disconnect the data cables.

4.2 Data Connections

The Regesta Smart v2 Nessum offers the following data connections.

4.2.1 LAN1 and LAN2 Connection

The Regesta Smart v2 Nessum is equipped with two 10/100/1000 Base-T Gigabit Ethernet ports, which support automatic MDI/MDIX for seamless connection to a local area network (LAN).

Make sure to carefully read the labels on these ports to differentiate them from other types of connections:

Fig. 16: **LAN1 and LAN2 Ports**

4.2.2 SFP/LAN3 Connection

The Regesta Smart v2 Nessum includes a dedicated Gigabit Ethernet interface for LAN connections, featuring an SFP socket for optical links.

Be mindful of the port labeling to avoid confusion with other interfaces:

Fig. 17: **SFP/LAN3 Socket**

4.2.2.1 Laser Information

Ensure that the SFP transceivers you choose comply with the following regulations:

- Class 1
- IEC/EN60825-1:2007 2nd Edition or any later European standard
- FCC 21 CFR Chapter 1, Subchapter J (in accordance with FDA and CDRH requirements)
- 2014/30/EU EMC Directive and the 2014/35/EU Low Voltage Directive for CE marking
- UL and/or CSA certified components for North American use
- 47 CFR Part 15, Class A

Warning

Laser Radiation. Do not use optical instruments directly or without appropriate protection. This is a CLASS 1 LASER PRODUCT.

Only class 1 SFP modules compliant with the IEC/EN 60825-1:2007 standard should be installed in the card socket.

Note

Be careful when removing the SFP/SFP+ transceiver module from the router, The transceiver module temperature might go over 70 °C (160 °F) and be too hot to touch with bare hands.

4.2.3 Nessum Connection

The Regesta Smart v2 Nessum features a High-Definition Power Line Communication (HD-PLC, now known as Nessum) interface, allowing seamless communication with compatible Nessum devices via power lines or coaxial cables. Depending on the model, the Nessum signal can be injected through either the power supply connector or two BNC connectors. In low-voltage models, the signal is injected directly into the power line through the device's power connector.

An LED labeled 'P' indicates the connection status.

Note

In low-voltage models, the Nessum signal is transmitted solely through the power connector, as BNC connectors are not included.

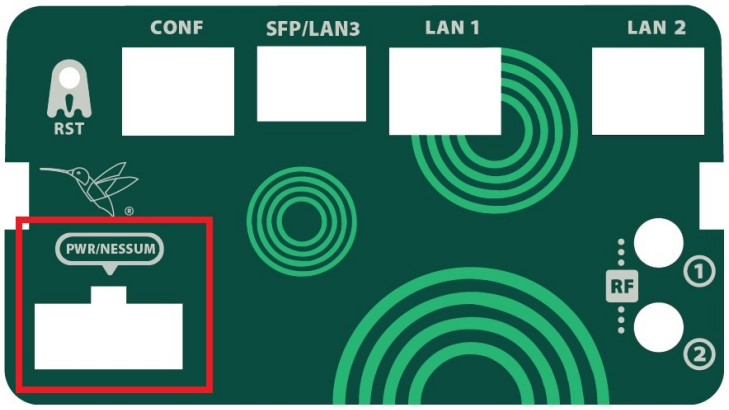


Fig. 18: **Nessum and Power Connector (Low-Voltage Model)**

4.2.3.1 Nessum BNC Ports

Medium-voltage models are equipped with two BNC connectors and an internal splitter, allowing the injection of the same Nessum signal into two separate power line segments. To inject Nessum signals into medium-voltage lines, external couplers can be connected to the BNC connectors on the Regesta Smart v2 Nessum. For more information, please refer to the section on *Nessum BNC Connectors* on page 33.

Fig. 19: **Nessum BNC Connectors (Medium-Voltage Model)**

4.2.4 WWAN Antenna Connections (RF Connectors)

Certain models of the Regesta Smart v2 Nessum router are equipped with a pair of RF antenna connectors. The antennas can be easily attached and detached by securely screwing or unscrewing them into the designated RF1 or RF2 connectors on the device's connector panel.

The RF1 connector is directly linked to the MAIN connector of the module, while RF2 is connected to the AUX connector.

Using these antennas with the Regesta Smart v2 Nessum router significantly enhances the signal reception and transmission capabilities of the WWAN module.

To further improve signal quality for cellular technologies such as HSUPA and LTE, the router includes two WWAN/

RF connectors. Regardless of the configuration, it is essential to always install the antenna on RF1, while the antenna on RF2 remains optional.

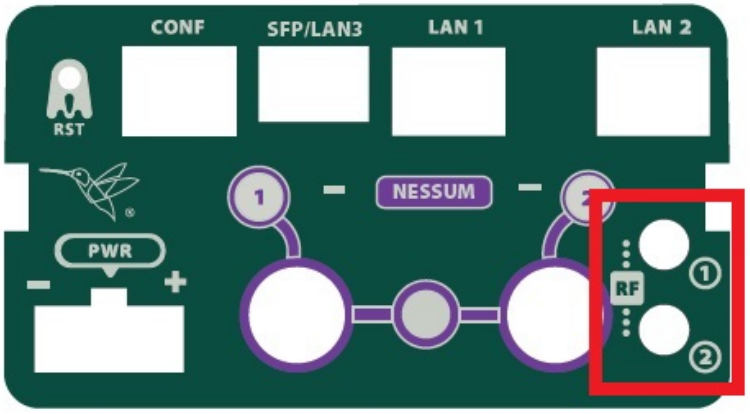


Fig. 20: **WWAN Antenna Connectors**

If the RF1 and RF2 antennas are connected via extension cables rather than being directly screwed into the router, they must be positioned at least 7 cm apart. For optimal performance, it is recommended to maintain a maximum distance of 25 cm between the two antennas. To comply with EMC regulations, the extension cable length should not exceed 3 meters.

For best results, it is recommended to use radio frequency accessories, such as antennas and cables, specifically endorsed by Teldat.

Teldat offers a range of accessories, including 90º mount antennas, outdoor and ceiling installation antennas, extension cables, and more. These accessories provide flexibility for installing the devices in various locations.

4.2.4.1 Placing the Antenna

The performance of devices can be greatly affected by the orientation and placement of their antennas, especially in relation to other wireless and radiation-emitting devices such as communication devices and personal computers.

Antennas are designed to transmit and receive radio signals, but their efficiency is also influenced by environmental factors like the distance from the base station, physical barriers, and interference from other radio frequencies (RF).

To ensure optimal coverage, follow these guidelines:

- When positioning your antenna, avoid physical obstructions that could block the wireless signal, such as walls or large objects. These can reduce signal quality. Ideally, place the antenna above ground level and directed towards the nearest base station.
- Consider the material density around the antenna. Keep it away from walls, metal screens, mirrors, and other materials that might disrupt signal reception.
- Avoid placing the antenna near columns or other objects that may cast shadows and reduce the coverage area.
- Ensure the antenna is not placed near metal pipes used for heating, air-conditioning, or other similar purposes.
- Be aware that other wireless devices, like telephones and microwaves, may cause temporary radio signal interference.
- Avoid installing antennas near or between racks that contain communication devices or computers. Instead, use an extension cable to position the antenna outside the rack for better signal performance.

The following recommendations apply to all wireless devices:

- Avoid touching or moving the antenna while the device is transmitting or receiving signals.
- Refrain from coming into contact with any equipment that contains radiation-emitting devices when they are in close proximity to exposed parts of the body, especially the face and eyes, during transmission.
- Do not install the device in potentially explosive areas.
- Be aware that wireless devices can interfere with other equipment; therefore, avoid using them in areas where medical devices are present.
- To ensure compliance with the 2014/53/EU RED directive, operate the device at least 20 cm away from your body.

4.2.5 Serial Port Connection

The Regesta Smart v2 Nessum features a single RJ45 connector that serves as a serial port.

4.2.5.1 Console Connector as Serial Port (CONF Connector)

The console port can be converted into an RS-232 asynchronous DCE serial port, which includes the following characteristics:

(1) DCE port.

(2) RS-232 norm.

(3) A maximum speed of 115200 bps.

(4) Only the RxD, TxD and GND signals are available. For detailed pin assignments, please refer to the *Configuration Connector* on page 33 section.

(5) RJ45 connector.

Fig. 21: Serial Console Connector

4.3 Installing the SIM Card

The Regesta Smart v2 Nessum includes a Wireless WAN interface that requires at least one SIM card for operation. However, in some countries, certain CDMA services offered by specific operators do not require a SIM card. The Regesta Smart v2 Nessum is equipped with two SIM trays located beneath the protective case, labeled SIM1 and SIM2. For setups using only one SIM card, we recommend placing it in the SIM1 tray.

Warning

Never install SIM cards while the device is powered on.

Always disconnect the device from the main power supply before inserting or removing SIM cards.

Additionally, ensure the device is disconnected before removing the protective casing to access the trays.

When inserting the SIM cards, take precautions to prevent electrostatic discharges (ESD).

Avoid touching the SIM card connectors.

To access the SIM trays, you will need to remove the protective case. For detailed instructions on how to do this, please refer to the section titled *Removing/Installing the Connector Protector* on page 13.

4.3.1 Identifying the SIM Trays

After removing the case, you will clearly see the elements illustrated below.

The Regesta Smart v2 Nessum supports two SIM cards, offering flexibility for various configurations. For example, installing two SIM cards allows one to function as a backup. To configure this setup, each SIM card must be assigned to its respective tray, as they have distinct configuration parameters.

The trays are labeled as SIM1 and SIM2, corresponding to socket 1 and socket 2, respectively.

Fig. 22: **Location of the SIM1 and SIM2 Trays**

4.3.2 Procedure to Install the SIM Card

After selecting the appropriate SIM card, follow these steps to install it:

(1) Push the fastening in the direction indicated by the arrow labeled *OPEN.*

(2) Open the upper part of the tray.

(3) Insert the SIM card fully, ensuring that the cut-off corner is on the right side (as shown) using the provided guides.

(4) Return the tray to its original position.

(5) Press down on the tray and firmly push the fastening toward *LOCK* until it securely clicks into place.

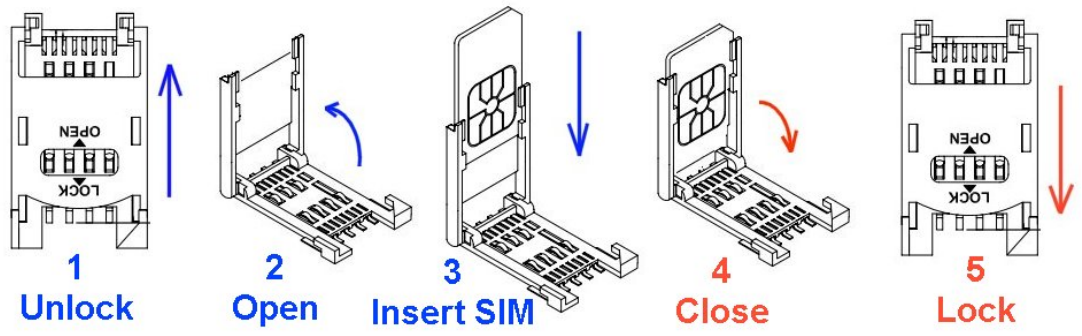


Fig. 23: **Inserting the SIM in the Internal Tray**

4.4 RST Button

The Regesta Smart v2 Nessum features an external button labeled “RST” on its connector panel, which serves two functions:

- It can be pressed to initiate a device reboot.
- It also allows the device to restart with its default configuration, which assigns the IP address 192.168.1.1 to the LAN1 port.

To prevent accidental activation, the button is securely protected and requires a sharp-pointed object for activation.

4.4.1 Restarting the Device

To restart the device, please follow these steps:

(1) Press and hold the RST button. The device will restart, and the ON LED will light up in green while all other LEDs (P, S, C, L, LAN1, LAN2, SFP/LAN3) will turn off.

(2) Release the RST button once all LEDs, except the ON LED, have turned off.

(3) The device will then fully restart.

4.4.2 Default Configuration

To use the RST button and restore the device to its default configuration, follow these steps:

(1) Press the RST button. The device will restart, the ON LED will light up green, and all other LEDs (P, S, C, L, LAN1, LAN2, SFP/LAN3) will turn off.

(2) Continue pressing the RST button until the S LED flashes orange, the ON LED remains green, and all other LEDs are off. This indicates that the device's configuration has been reset to its default settings.

(3) Release the RST button to allow the device to complete the restart.

(4) With the device restored to its default configuration, you can access it using the IP address 192.168.1.1. Remember that it can be accessed from the LAN1 port.

4.5 Dying Gasp Alarm

The Regesta Smart v2 Nessum offers an optional board that triggers an alarm in the event of a power outage or if the power supply cable is disconnected.

With a power consumption of just 10 W, the device can remain powered for up to 6 seconds, allowing the alarm to be transmitted through any active interface.

This alarm, designated as GW.075, can be sent as an Event, SNMP-TRAP, or Syslog via the Event Logging System (ELS).

To configure this functionality, follow these steps:

(1) Begin by configuring the ELS to enable the GW.075 event as either a Trace, Syslog event, or snmp-trap. For detailed instructions on ELS configuration, please refer to the “Teldat *Dm704-I Configuration and Monitor-*

ing" manual.

(2) If necessary, proceed to configure the SNMP protocol, including the host and sending parameters.
For further guidance on SNMP configuration, please consult the "Teldat *Dm712-I SNMP Agent*" manual.

(3) If needed, configure and enable the Syslog feature and server.
For additional information on the Syslog feature, refer to the "Teldat *Dm753-I Syslog Client*" manual.

4.6 Troubleshooting

The table below offers troubleshooting guidance for common device installation issues. If your problem isn't resolved by the steps outlined, please contact your dealer for additional support.

Symptom	**Solution**
None of the LEDs on the router are lighting up.	Check the router's power supply, including the power source and main power outlet.
The local console is unresponsive.	Confirm that the correct console cable is being used and properly connected to both the device and asynchronous terminal. Ensure the terminal is set to the correct port. Verify that the terminal settings are 115200 8N1. Ensure the console isn't being used for event processing.
The local console is displaying irrelevant information.	Confirm that the terminal is set to the correct port. Verify that the terminal settings are 115200 8N1.
Forgotten router access password.	Reset the configuration using the RST button (refer to the relevant section for instructions).
The device loses date and time settings upon restarting.	Any settings configured via the time set command are not saved after a restart. Use the NTP protocol to maintain accurate date and time settings.
The LAN1, LAN2, or SFP/LAN3 LEDs are not lighting up green.	Check the Ethernet cable, fiber connection, and network setup (a crossover cable may be needed). For further guidance, consult the "Teldat *Dm709-I LAN Interfaces*" manual.
The S LED is red.	Ensure the SIM card is properly inserted. Verify that the SIM PIN is correct. Check that the antenna is correctly installed and securely screwed in. Have technical support confirm that the device is optimally positioned for service. For more details, refer to the "Teldat *Dm781-I Cellular Interface*" manual.

4.7 Updating the Software

The Regesta Smart v2 Nessum router supports updating to the latest software releases. For detailed information about available updates, we recommend contacting your distributor.

There are several methods for updating our routers. For step-by-step guidance, please refer to the "Teldat *Dm 748-I Software Updating*" manual.

The required software is provided in a distribution format, consisting of a single file that contains all necessary update components, along with detailed information about their contents.

The Regesta Smart v2 Nessum features independent modules for the Wireless WAN interface, allowing you to choose modules from different manufacturers or multiple modules from the same provider, depending on the technology used. Typically, firmware is separate from the software. To ensure the correct update, consult your distributor for the appropriate UPGRADE file specific to your Wireless WAN module, as detailed in the “Teldat *Dm781-I Cellular Interface*” manual, which offers instructions for module upgrades.

The Regesta Smart v2 Nessum includes a dedicated Nessum chipset that requires its own firmware, separate from other device software. If a Nessum firmware upgrade is needed, contact your distributor for the appropriate UPGRADE file. The “Teldat *Dm1092-I Nessum Interface*” manual also provides detailed instructions on how to perform the firmware upgrade.

4.7.1 Establishing a Connection to the Router

There are two methods available for accessing the device's Command Line Interface (CLI):

- Via the CONF connector.
- Using the Telnet protocol.

4.7.1.1 Connecting Via the Local Console (CONF Connector)

The Regesta Smart v2 Nessum features a convenient RJ45 female connector labeled CONF on its front panel, providing access to the device's local console. To use this, connect the CONF port to an asynchronous terminal or a PC with terminal emulation software.

- Speed: 115200 bps
- Data bits: 8
- Stop bits: 1.
- Parity bits: None.
- No flow control.

To connect to the configuration port, use the provided RJ45 cable and the female RJ45-to-female DB9 adapter included with the router. If your terminal uses DB25 connectors, an additional adapter will be required.

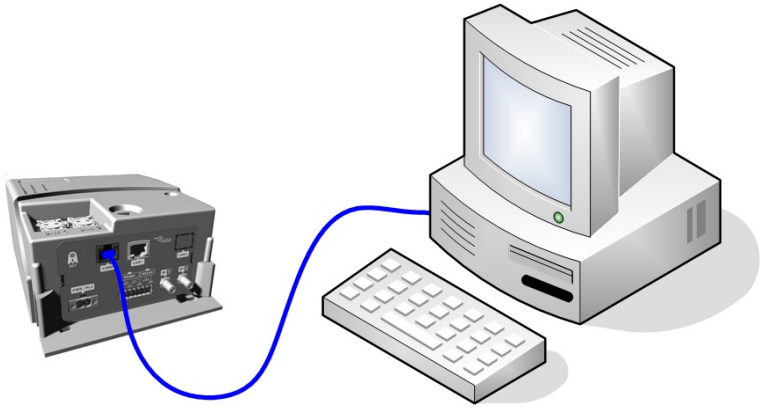


Fig. 24: **Connecting for Configuration**

4.7.1.2 Connecting via an IP Terminal (LAN1 Connector)

When connecting through an IP terminal, the Regesta Smart v2 Nessum will automatically use its default configuration if no prior setup has been done.

The default settings are:

- IP address: 192.168.1.1
- Subnet mask: 255.255.255.0

Note

Certain devices may leave the factory with custom settings, which could result in a different default configuration than listed above.

To access the device's configuration console using the Telnet IP protocol, follow these steps:

- Configure the Ethernet interface of your IP terminal (typically a PC) with an IP address in the range of 192.168.1.2 to 192.168.1.254, and set the subnet mask to 255.255.255.0 (e.g., 192.168.1.2, 255.255.255.0).
- Connect the Ethernet interface of the IP terminal to the router's LAN1 connector using the provided RJ45 Ethernet cable.
- Initiate a Telnet session from the IP terminal to the default IP address, 192.168.1.1 (for the Regesta Smart v2 Nessum).
- No credentials (username/password) are required to access the console under the default configuration.

Chapter 5 Compliance

5.1 Manufacturer Information

Brand	Teldat
Manufacturer	Teldat S.A.
Country	Spain
Postal Address	Isaac Newton, 10 Parque Tecnológico de Madrid, 28760 Tres Cantos, Madrid, Spain
International Phone	+34 91 807 65 65

5.2 Intended Use of the Equipment

The Regesta Smart v2 Nessum is designed specifically as an industrial router. Using this equipment in a residential setting may result in radio interference.

5.3 EC Declaration of Conformity (Non-Radio Version)

English (EN)	Teldat S.A. hereby certifies that the Regesta Smart v2 Nessumtelecommunications equipment is compliant with the following European Parliament and Council directives: Directive 2014/30/EU (EMC) Directive 2014/35/EU (LVD) Directives 2011/65/EU and 2015/863/EU (RoHS)
Spanish (ES) Español	Por la presente, Teldat S.A. declara que el tipo de equipo de telecomunicaciones Regesta Smart v2 Nessum es conforme con: Directiva 2014/30/UE (EMC) Directiva 2014/35/UE (LVD) Directivas 2011/65/UE y 2015/863/UE (RoHS) del Parlamento Europeo y del Consejo.

The EC declaration of conformity and additional product documentation are available at:

http://www.teldat.com/conformity

5.4 EC Declaration of Conformity (Radio Version)

English (EN)	Teldat S.A. hereby certifies that the Regesta Smart v2 Nessum radio equipment is compliant with the following European Parliament and Council directives: Directive 2014/53/EU (RED) Directives 2011/65/EU and 2015/863/EU (RoHS)
Spanish (ES) Español	Por la presente, Teldat S.A. declara que el tipo de equipo radioeléctrico Regesta Smart v2 Nessum es conforme con: Directiva 2014/53/UE (RED) Directivas 2011/65/UE y 2015/863/UE (RoHS) del Parlamento Europeo y del Consejo.

The EC declaration of conformity and additional product documentation are available at:

http://www.teldat.com/conformity

5.5 CE Marking

This equipment complies with CE marking procedures and requirements.

5.6 National Restrictions

In accordance with Article 10 of Directive 2014/53/EU, we advise that there may be national restrictions and authorization requirements, which are subject to change. Teldat S.A. recommends consulting local authorities for the latest information regarding national regulations.

5.7 Operating Frequency

For details on operating frequencies, refer to Appendix *Radio Information* on page 37.

5.8 REACH

The product and its packaging comply with the REACH Candidate List, ensuring that chemical substances are present at concentrations below 0.1% weight by weight (w/w). This declaration is regularly updated to reflect changes or additions to the REACH Candidate List, with information provided to consumers upon request.

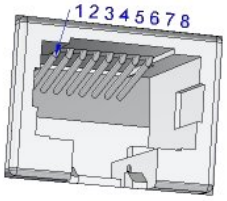
5.9 WEEE Information

	The crossed-out wheelie bin symbol indicates that the device must be disposed of separately from regular household waste. Please take it to an appropriate disposal facility at the end of its service life. El símbolo del contenedor con la cruz, que se encuentra en el aparato, significa que cuando el equipo haya llegado al final de su vida útil, deberá ser llevado a los centros de recogida previstos, y que su tratamiento debe estar separado del de los residuos urbanos.

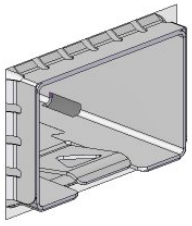
Appendix A Technical Information

A.1 Connectors

A.1.1 LAN1 and LAN2 Connectors

RJ45 LAN	RJ45 PIN	FE Signals	GE Signals
	**1**	BI-DA+	BI-DA+
	2	BI-DA-	BI-DA-
	3	BI-DB+	BI-DB+
	4	--	BI-DC+
	5	--	BI-DC-
	6	BI-DB-	BI-DB-
	7	--	BI-DD+
	8	--	BI-DD-

A.1.2 SFP/LAN3 Socket

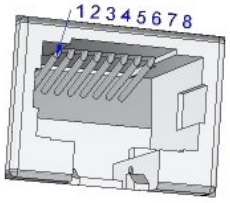
SFP	
	Standard SFP socket

A.1.3 WWAN/RF Connectors

Devices with this interface come with two SMA female connectors.

SMA Female	**PIN**	**ANT**
	**Internal**	RF in/out
	External	GND

A.1.4 Configuration Connector

RJ45 CONFIGURATION	PIN	CONF
	**1**	--
	2	TxD (input)
	3	GND
	4	--
	5	--
	6	GND
	7	RxD (output)
	8	--

A.1.5 Nessum BNC Connectors

BNC	PIN	SERIAL
	Internal	Nessum signal
	External	GND

A.1.6 Power Supply Connector

2-wire terminal block with a 5.08 mm pitch	For AC models, Phase and Neutral connectors, while MR models for DC supply use positive and negative connectors.

A.2 Technical Specifications

A.2.1 Hardware Architecture

MEMORY	256 Mbytes in SDRAM.
STORAGE UNIT	FLASH Memory (4 Gbytes).

A.2.2 Nessum Interface

PROTOCOL	Nessum
ROLE	Master or Terminal mode
COMMUNICATIONS	Frequency band: x-2 (2 - 14 MHz) x-4 (2 - 7 MHz) x-5 (7 - 14 MHz) Modulation: Wavelet OFDM Error correction: RS, LDPC-CC
TECHNOLOGY	IEEE 1901-2020,1901b,1901c (PHY/MAC) ITU-G.9905 (routing)
CONNECTOR	2-pole terminal block with a 5.08 mm pitch, which can serve as a power supply connection. It also includes a dual BNC connector for RG58 cable, equipped with an internal splitter.

A.2.3 LAN1 and LAN2 Interfaces

PROTOCOLS	Ethernet (802.3).
PORTS	1 port with automatic MDI/MDX detection.
SPEED	10/100/1000 Mbps (BaseT).
CONNECTOR	RJ45 female.
ISOLATION	Standard for E1 interface (1.5 KV).

A.2.4 SFP/LAN3 Interface

STANDARDS	802.1Q (VLAN). 1000-Base-X. MSA and SFF 8472 compliant.
SPEED	1000 Mbps full duplex.
TYPES	LX/LH (single-mode 1310 nm). SX (multi-mode 850 nm). ZX (single-mode 1550 nm).
CONNECTOR	Standard SFP socket.

A.2.5 Wireless WAN Interface

WWAN Standard/Bands	EC25-E:
	• LTE:
	  • FDD. B1, B3, B5, B7, B8, B20
	  • TDD: B38, B40, B41
	• WCDMA: B1, B5, B8
	• GSM/GPRS/EDGE: 900/1800 MHz

Speed (DL/UL)	EC25-E:
	• LTE Cat 4.
	  • FDD. 150 Mbps/50 Mbps
	  • TDD: 130 Mbps/35 Mbps
	• HSPA+ Cat 24/6: 42 Mbps/5.76 Mbps
	• EDGE: 236 Kbps

CONNECTOR	Two optional RF SMA female connectors.
SIM Slots	2 Mini-SIM slots (2FF) ISO/IEC 7810:2003, ID-000 (1.8 V / 3 V)

A.2.6 Configuration Interface

LOCAL TERMINAL	V.24 115200-8-N-1-without flow control.
CONNECTOR	RJ45 female on the connector panel.

A.2.7 Power Supply Specifications

A.2.7.1 AC Model

NOMINAL	110-240 V AC.
ABSOLUTE MAXIMUM	85-264 V AC.
FREQUENCY	50-60 Hz
MAXIMUM POWER	10 W
CONNECTOR	2-pole 5.08 mm pitch terminal block.

A.2.7.2 MR Model

NOMINAL	110-240 V AC 48-72 V DC
ABSOLUTE MAXIMUM	85-264 V AC 40 - 85 V DC
FREQUENCY	50-60 Hz (AC)
MAXIMUM POWER	10 W
CONNECTOR	2-pole 5.08 mm pitch terminal block.

A.2.8 Dimensions and Weight

TYPE	Ruggedized plastic casing and optional DIN rail mounting solution.
LENGTH x WIDTH x HEIGHT	140 x 80 x 190 mm.
WEIGHT	1 Kg.

A.2.9 Environmental Specifications

TEMPERATURE RANGE	OPERATION: -20 °C to +70 °C STORAGE: -25 °C to +70 °C
RELATIVE HUMIDITY	5 % to 93 %

Appendix B Radio Information

B.1 RF WWAN Specifications

The Regesta Smart v2 Nessum model, equipped with the EC25 module, provides network connectivity across various radio frequency bands, adhering to the latest 3GPP standards, including:

- LTE (3GPP Release 10)
- DC-HSPA+ (3GPP Release 8)
- HSPA+ (3GPP Release 7)
- HSUPA (3GPP Release 6)
- HSDPA (3GPP Release 5)
- GSM, GPRS, EDGE (3GPP Release 99 with Feature Package#1)

Please note that antennas are not included with the product. Users are free to select compatible antennas, but it is their responsibility to ensure that the chosen antennas comply with local regulations.

Technology: LTE.

Bands	Frequencies	Conducted Transmit Power
Band 1	Tx: 1920-1980 MHz Rx: 2110-2170 MHz	+23 dBm ± 2 dB
Band 3	Tx: 1710–1785 MHz Rx: 1805–1880 MHz	+23 dBm ± 2 dB
Band 7	Tx: 2500–2570 MHz Rx: 2620–2690 MHz	+23 dBm ± 2 dB
Band 20	Tx: 832–862 MHz Rx: 791–821 MHz	+23 dBm ± 1 dB

Technology: UMTS(WCDMA)/ HSDPA/ HSUPA/ HSPA+/ DC-HSPA+.

Bands	Frequencies	Conducted Transmit Power
Band 1	Tx: 1920-1980 MHz Rx: 2110-2170 MHz	+24 dBm +1/-3 dB
Band 8	Tx: 880–915 MHz Rx: 925–960 MHz	+24 dBm +1/-3 dB

Technology: GSM / GPRS / EDGE.

Bands	Frequencies	Conducted Transmit Power
EGSM 900 (900 MHz)	Tx: 880–915 MHz Rx: 925–960 MHz	+33 dBm ± 2 dB +27 dBm ± 3 dB
DCS 1800 (1800 MHz)	Tx: 1710–1785 MHz Rx: 1805–1880 MHz	+30 dBm ± 2 dB +26 dBm ± 3 dB