



Regesta Smart PLC

Installation Manual

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Chapter 1 About this Manual

This is the installation manual for the Regesta Smart PLC router and contains information on how to correctly install this device in a working environment.

1.1 Supported devices

The information provided in this installation manual only applies to the **Regesta Smart PLC** Series.

1.2 Who should read this manual?

This publication is for the person installing and configuring the Regesta Smart PLC router for the first time. The installer should be familiar with network structures, terms, and concepts.

1.3 When should this manual be read?

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

This manual will help you understand your new device in greater depth.

1.4 What is in this manual?

This installation guide contains the following information:

- A description of the available features in the Regesta Smart PLC.
- Technical specifications.
- Power supply requirements.
- A description of the device LEDs and connectors.
- Troubleshooting.

1.5 What is not in this manual?

This document does not contain information about the device software or its configuration. For information on how to configure this device, please see the relevant protocol manuals found on the Teldat website:

<http://www.teldat.com>

1.6 How is the information organized?






Each chapter focuses on a specific part of the hardware and its components. All descriptive and technical specifications, as well as information on a given component, can be found in the relevant chapter.





1.7 Risk identification



WARNING: Signal word used to designate a potentially dangerous situation that may cause severe injuries or death if not avoided.

1.8 Safety warnings

	<p>This equipment must be installed in restricted access locations. Only trained and qualified personnel are allowed to install, replace or service this equipment as instructed in this installation guide.</p>
	<p>Este dispositivo debe ser instalado en lugares de acceso restringido por personal cualificado y entrenado, como se describe en esta guía de instalación.</p>
	<p>The electric current in power cables, telephone lines and communication cables is dangerous. To prevent electric shocks, before installing, handling or opening the equipment covers, connect and disconnect the cables following the steps set forth in Connecting on page 19 and Disconnecting on page 19.</p>
	<p>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".</p>
	<p>This unit might have more than one power supply connection. Check that all connections have been disconnected when turning off the device.</p>
	<p>El equipo podría tener mas de una fuente de alimentación. Asegurese de que todas las conexiones han sido desconectadas cuando apague el equipo.</p>
	<p>The protective case must be put back in place before you power the device.</p>
	<p>Se deberá volver a colocar la cubierta protectora antes de conectar el dispositivo a la alimentación.</p>
	<p>The power cable is not supplied with the router. The estimated peak consumption for 230V AC operation is 100 mA. Any cable with a cable gauge equal to, or greater than, a 0.75 mm² section (AWG18 conductor) that is approved by IEC 60227 is acceptable.</p>
	<p>El cable de alimentación no se suministra con el router. El consumo máximo a 230V 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.</p>
	<p>All interconnected communication devices should be plugged to THE SAME GROUNDED POWER OUTLET, which should at the same time be of good quality (lower than 10 ohms).</p> <p>Connecting all data devices to the same power source is strongly recommended regardless of whether the workplace has an uninterrupted power supply (UPS), a regulated supply or is independent of other power supplies (such as lighting, etc.). This will help to avoid malfunctions and premature aging of the drivers and other components.</p>
	<p>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).</p>

	<p>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.</p>
	<p>Laser Radiation. Do not use optical instruments directly or without proper protection. CLASS 1 LASER PRODUCT.</p> <p>The SFP modules to be installed in the card socket should be class 1 devices that comply with the IEC/EN 60825-1:2007 standard.</p>
	<p>Radiación laser. No mirar directamente con instrumentos ópticos. Producto LASER CLASE 1.</p> <p>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.</p>
	<p>Never install the SIM cards when the device is switched on.</p> <p>Always disconnect the device from the main power supply before installing the SIM cards.</p> <p>Always disconnect the device before removing the casing to access the trays.</p> <p>When inserting the SIM cards, please protect yourself against electrostatic discharges (ESD).</p> <p>Do not touch the SIM card connectors.</p>
	<p>No instale nunca las tarjetas SIM con el equipo encendido.</p> <p>Desconecte siempre el equipo de la red antes de instalar las tarjetas SIM.</p> <p>Desconecte siempre el equipo antes de desmontar la carcasa para acceder a las bandejas.</p> <p>Al insertar las tarjetas SIM, protéjase contra descargas electroestáticas (ESD).</p> <p>No toque los conectores de las tarjetas SIM.</p>
	<p>The screws must be screwed into a (wooden) wall stud or the right type of wall anchor for the wall. Screws driven directly into drywall are not strong enough to hold the weight of the router.</p>
	<p>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.</p>
	<p>The Regesta Smart PLC is a permanently connected Class II device. Pursuant to safety regulations on electrical overloads, the device must be connected to the main power supply through a 1 amp (minimum) thermal magnetic circuit breaker that carries the CE marking.</p>
	<p>El Regesta Smart PLC 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 1 A que cuente con marcado CE.</p>

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 Dm823-I *PLC Gateway*

1.10 Technical support

Contact information:

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Email: support@teldat.com

Chapter 2 Product Overview

This chapter provides an overview of the features available for Regesta Smart PLC routers and their components. This information includes:

- *General description* on page 5.
- *Device models* on page 6.
- *Hardware features* on page 6.
- *Components* on page 7.
- *Power supply* on page 12.

2.1 General description

The Regesta Smart PLC router family is a range of IP routers specially designed to operate in hostile and extreme environments. Thanks to their ruggedized mechanics and special characteristics, which allow them to bear extreme temperatures, these routers are particularly suited for: industrial environments, industrial telecontrol, distribution installations for electricity, gas, water, etc.

The main feature that this router family offers is allowing a virtual concentrator integrated in a management system (i.e., a system software that includes a DLMS client) and the smart meters registered on a PLC PRIME network (controlled by the Regesta Smart PLC) to communicate. In this scenario, the Regesta Smart PLC functions as a Base Node. The main communication method is a TCP transport layer for DLMS, with extensions for optimally multiplexing IEC 61334-4-32 connections (also known as Ticket 67) over a Wireless WAN (WWAN) data network on private or public networks or a LAN connection. The number of smart meters controlled depends on the license.

Thanks to its modular design, this device can quickly adapt to the latest WWAN technologies. The Regesta Smart PLC is compatible with wireless technologies such as GPRS, EDGE, UMTS, HSDPA, HSUPA, HSPA+, and LTE. The device also has space for 2 SIM cards: one active SIM and the other for backup.

As for LAN networks, this device incorporates two port 10/100/1000 BaseT LAN Ethernet ports.

The device's RS-232 console port can be used as a DCE asynchronous serial communications port with a maximum speed of 115200 bps and without control signals. The device can incorporate two additional asynchronous serial ports with a maximum speed of 115200 bps with RS-232 DCE technology or with 2-4 wire RS-485/RS-422 technology. The serial port connection is based on a pluggable RJ45 connector.

The device incorporates a protective casing that prevents the connectors from being touched while the device is powered.



Fig. 3: Regesta Smart PLC

2.2 Device models

The following table lists the various Regesta Smart PLC router models available.

Regesta Smart PLC models

Code	Description
RWRTHR2ZAC-PLC	Regesta Smart PLC 1 LAN Gigabit Ethernet port, 1 WAN Combo Gigabit Ethernet port, 1 RS232, AC powered (110 - 240 VAC).
RWRTHR2LAC-PLC	Regesta Smart PLC 1 LAN Gigabit Ethernet port, 1 WAN Combo Gigabit Ethernet port, 1 RS232, 1xWWAN (Bands: LTE 1, 3, 5, 7, 8, 20, 38, 40, 41 - WCDMA 1, 5, 8), AC powered (110 - 240 VAC).

2.3 Hardware features

The following lists the hardware platform features for the Regesta Smart PLC router.

- External Power Input:
 - Terminal Block 2 Poles 5.08 mm pitch connector.
 - AC Power
 - Nominal: 110 - 240 VAC.
 - Absolute: 85 - 264 VAC.
 - Frequency : 50 - 60 Hz.

- Power: 9W.
- Dying Gasp Alarm to report power failures or removal of the power supply cable. An additional accessory is required for this function.
- LAN: RJ45 connector will support IEEE802.3 Ethernet over copper wiring standards of 10Base-T, 100Base-TX, and 1000Base-T
- WAN: Gigabit Ethernet Combo RJ45+SFP connector:
 - RJ45 connector will support IEEE802.3 Ethernet over copper wiring standards of 10Base-T, 100Base-TX, and 1000Base-T.
 - SFP port will support 1000Base-X Fiber Ethernet standard SFP.
- Serial Ports.
 - 1xRJ45 connector RS-232 port (DCE).
 - 2xRJ45 connectors for RS-232 port (DCE) and/or RS-485 (2/4 wires). Its availability requires one additional accessory.
- WWAN: Depending on the model. ("L" models)
 - 1xLTE Category 4 WWAN module with two SMA connectors.
 - 2 Internal SIM trays with 2FF form factor.
- External Reset/Recovery push button

2.4 Components

2.4.1 Front panel

The front panel includes the status LEDs.

The following figure shows the front panel.



Fig. 4: Front Panel

While the device is in startup mode, LED **L** lights up in green. Once the device has started up, the LEDs indicate the following:

LEDs

LED	Associated Interface	Status	Description
ON	Power	Off	Device is not powered on.
		Green	Device is powered on.

P	PLC interface	Off	PRIME PLC interface is disabled, unavailable or not installed.
		Red	PRIME PLC is running but no SNs are currently detected.
		Amber	PRIME PLC is running and SNs are detected, but the DC (Data Concentrator) connection is not established.
		Green	PRIME PLC is running, SNs are detected and DC connection is working. PRIME traffic can be sent through PLC interface. <ul style="list-style-type: none"> • Steady: Data is not being transferred. • Flashing: Data is being transferred.
S	Cellular interface	Green	SIM1 operating SIM. This is processing traffic through the carrier for the SIM installed in this tray.
		Amber	SIM2 operating SIM. This is processing traffic through the carrier for the SIM installed in this tray.
C	Cellular interface	Red	Cellular interface is unavailable, not installed or not registered.
		Amber	The device has registered in the network and is establishing the PDP connection.
		Green	The device is registered, PDP connection is established and IP traffic can be sent through the CELLULAR interface. <ul style="list-style-type: none"> • Steady: Data is not being transferred. • Flashing: Data is being transferred.
L	Cellular interface corresponding to the active SIM.	Off	Cellular interface is not active.
		Red	Coverage level below -100dBm.
		Amber	Coverage level between -90dBm and -100dBm.
		Green	Coverage level above -90dBm.
LAN	Ethernet LAN interface	Off	Ethernet LAN is disabled or connection is not established.
		Green	Ethernet connection (link) established: <ul style="list-style-type: none"> • Steady: Data is not being transferred. • Flashing: Data is being transferred.
WAN	Ethernet WAN interface (RJ45)	Off	Ethernet WAN is disabled or connection is not established.
		Green	Ethernet connection (link) established: <ul style="list-style-type: none"> • Steady: Data is not being transferred. • Flashing: Data is being transferred.
SFP	Ethernet WAN interface (SFP)	Off	SFP is not used.
		Green	Ethernet SFP connection (link) is established
S1	Multi standard serial interface 1	Off	Serial port 1 is disabled or not initialized.
		Green	Port is in active state, shows interface activity: <ul style="list-style-type: none"> • Steady: Data is not being transferred. • Flashing: Data is being transferred.

S2	Multi standard serial interface 2	Off	Serial port 2 is disabled or not initialized.
		Green	Port is in active state, shows interface activity: <ul style="list-style-type: none"> Steady: Data is not being transferred. Flashing: Data is being transferred.

Note: Some LEDs may behave differently depending on how the device is configured.

2.4.2 Connector panel

The connector panel is covered by a protective case. You have to remove this case to access the connector panel. For further information on how to remove/install the protective cover, please, see [Removing/Installing the connector protector](#) on page 13.

The following figure shows the connector panel. This panel includes all the connectors on the Regesta Smart PLC router.



Fig. 5: Connector Panel

The connector panel elements are as follows:

Front Panel Elements

Item	Description
A	RST. Reset button. For further information on how the reset button works, please see RST button on page 26.
B	CONF. RJ-45 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, refer to: <ul style="list-style-type: none"> - Console connector as serial port (CONF connector) on page 23. - Configuration connector on page 34. - Configuration interface on page 37.
C	WAN Gigabit Ethernet. SFP connector.

	<p>For more information about the WAN interface with SFP connector, refer to:</p> <ul style="list-style-type: none"> - WAN connections on page 20 - WAN SFP connector on page 33 - WAN SFP interface on page 36
D	<p>WAN Gigabit Ethernet. RJ-45 connector.</p> <p>For more information about the WAN interface with Base-T connector, refer to:</p> <ul style="list-style-type: none"> - WAN connections on page 20. - WAN base-T connector on page 33. - WAN base-T interface on page 36.
E	<p>LAN Gigabit Ethernet Port.</p> <p>For more information about the LAN interface, refer to:</p> <ul style="list-style-type: none"> - LAN connection on page 19. - LAN connector on page 33. - LAN interface on page 35.
F	<p>POWER/PLC. Power connection and PLC signal injection.</p> <p>For more information about the power connection options, refer to:</p> <ul style="list-style-type: none"> - Power source on page 18. - Power supply specifications on page 37. <p>For more information about the PLC connection options, refer to:</p> <ul style="list-style-type: none"> - PLC connection on page 21 . - PRIME PLC interface on page 35.
G	<p>DCE RS-232 serial ports or 2-4 wire RS-485/RS-422.</p> <p>The type of configuration of each port depending on the hardware configuration of the device (model).</p> <p>For more information on the connector for serial ports, 2-4 wire RS-485/RS-422 and RS-232 DCE, refer to:</p> <p>RS232 option:</p> <ul style="list-style-type: none"> - RS-232 serial port on page 24. - RS-232 serial port connectors on page 34. - RS-232 serial interface on page 37. <p>RS485 option</p> <ul style="list-style-type: none"> - RS-485/RS-422 serial port on page 24. - RS-485 serial port connectors on page 35. - RS-485 serial interface on page 37.
H	<p>RF/WWAN antenna connectors for the Cellular interface, depending on the model.</p>

For more information about the Cellular interface, refer to:

- [WWAN antenna connections \(RF connectors\)](#) on page 21.
- [WWAN/RF connectors](#) on page 34.
- [Wireless WAN interface](#) on page 36.

Refer to [Installing the SIM card](#) on page 24 for more information about SIM installation for the Cellular interface.

2.4.3 Underside panel

The router's identification label is located on the underside panel. The underside panel has several perforations for different mounting options. The following figure shows the underside panel:

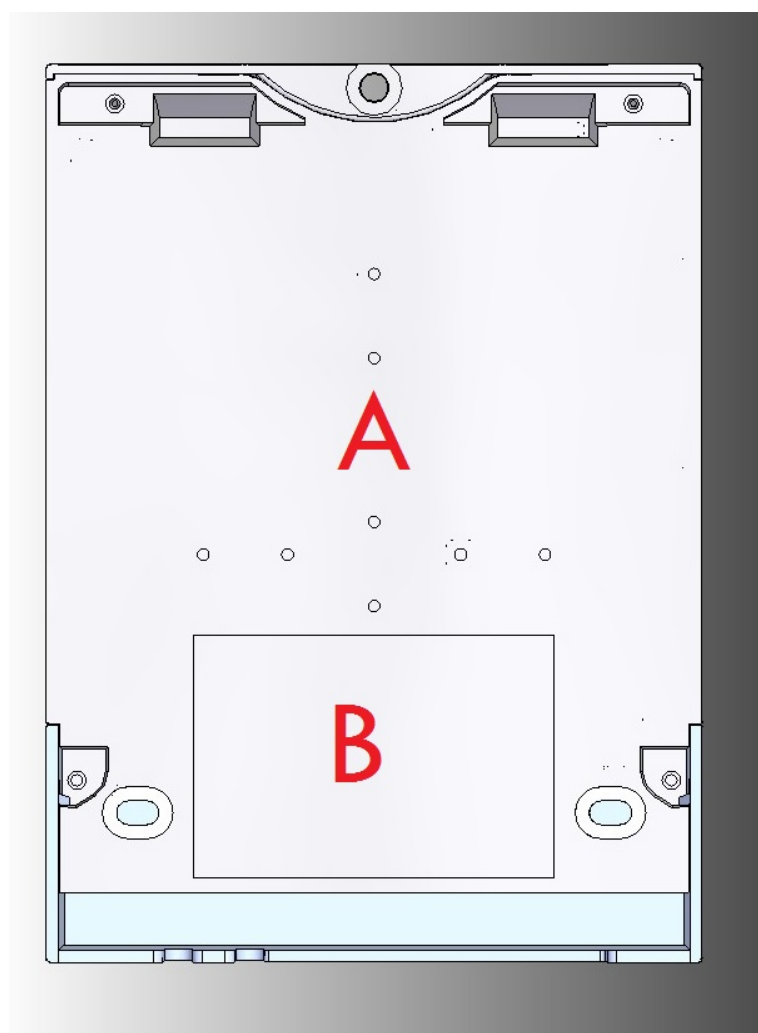


Fig. 6: Underside Panel

The following elements can be found on the underside panel:

Underside Panel elements

Item	Description
A	Slots for fixing accessories used to attach the device to a DIN rail mount. For further information on this accessory, please see section Wall mounting on page 16.
B	Platform where the label containing product information is placed. This label contains information on the device model, MAC, serial number, etc.

2.5 Power supply

The Regesta Smart PLC AC version is powered from an external AC source. The nominal power voltages are 110-240 V AC.

2.5.1 Dying gasp option

The Regesta Smart PLC can be equipped with an optional Dying Gasp board that allows an alarm to be sent in the event of a power failure or removal of the power supply cable.

Chapter 3 Installing the Router

This chapter describes the procedures for successfully installing the Regesta Smart PLC router and contains the following sections:

- [Workplace conditions](#) on page 13.
- [Removing/Installing the connector protector](#) on page 13.
- [Installing a DIN rail mount accessory](#) on page 15.
- [Wall mounting](#) on page 16.

3.1 Workplace conditions



Warning

This equipment must be installed in restricted access locations. Only trained and qualified personnel are allowed to install, replace or service this equipment as instructed in this installation guide.

- The device should not be placed amongst papers, magazines or other elements that could hinder natural air circulation.
- Knocks and/or strong vibrations should be avoided during transport, operation and storage.



Warning

The electric current in power cables, telephone lines and communication cables is dangerous. To prevent electric shock, before installing, handling or opening the equipment covers, connect and disconnect the cables following the steps set forth in [Connecting](#) on page 19 and [Disconnecting](#) on page 19.

3.2 Removing/Installing the connector protector

The Regesta Smart PLC includes a protective case for connectors. The main function of the protective case is to provide protection against accidental electric shock by preventing direct contact with the connectors while the device is in operation.



Warning

This unit might have more than one power supply connection. Check that all connections have been disconnected when turning off the device.

To remove the protective case, carry out the following steps.

The middle of the front panel contains a fastening element to fasten the protective case. To remove the case, rotate the fastening element 90° to the left or right.

The following figure shows how to remove the protective case from the device.



Fig. 7: Removing the protective case

Slide the case upwards as shown below:

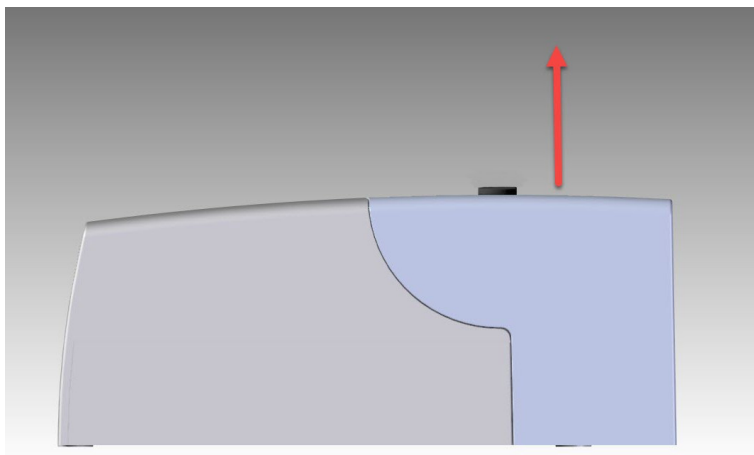


Fig. 8: Sliding the case up

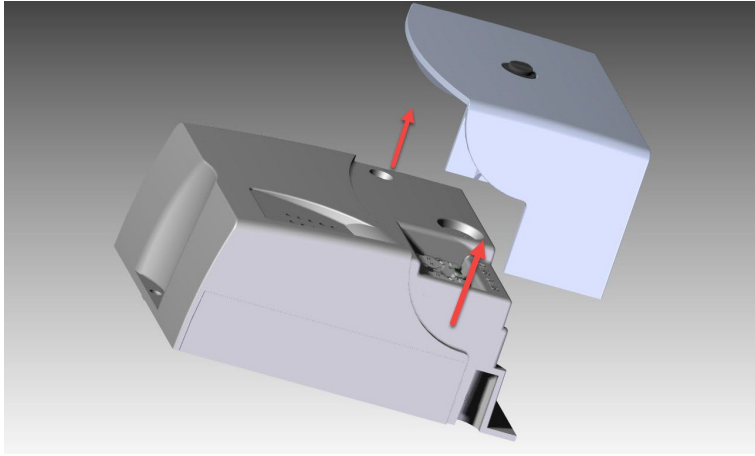


Fig. 9: Lifting the protective case

To replace the protective case, follow the steps below.

First, place the case in the correct position by sliding it downwards onto the device:

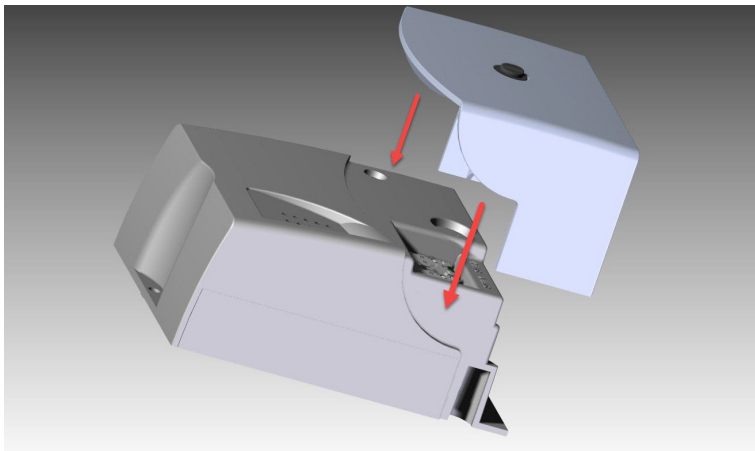


Fig. 10: Replacing the protective case

Lock the case in place by turning the fastening mechanism a quarter turn to the horizontal position and pushing down. You should hear a little click.



Warning

The protective case must be put back in place before you power the device.

3.3 Installing a DIN rail mount accessory

The Regesta Smart PLC can be installed on a standard DIN rail. A special kit is required to mount the device on the DIN rail. This kit is included with delivery of the device. The DIN rail kit allows the device to be installed in different positions.

The kit contains 2 screws for fixing the rail mount to the device. The holes on the bottom of the device allow you to place the DIN rail mount in two different positions:

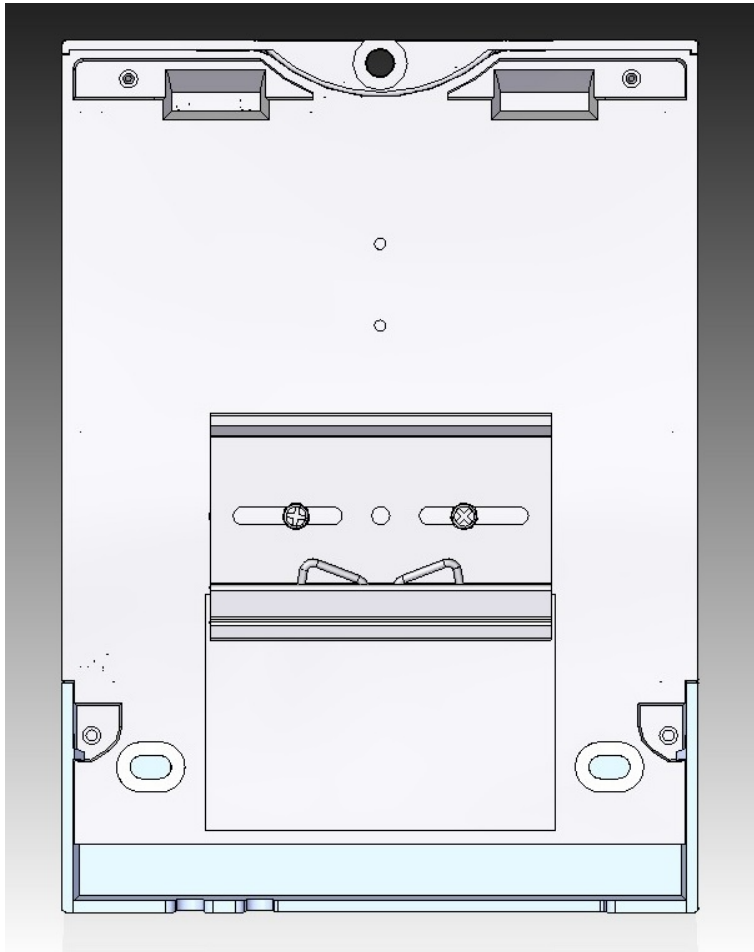


Fig. 11: DIN rail mount: Position 1

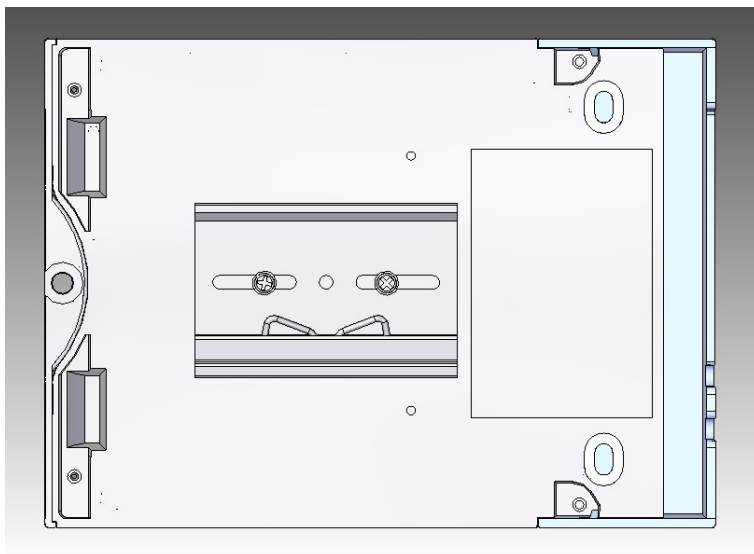


Fig. 12: DIN rail mount: Position 2

3.4 Wall mounting

The Regesta Smart PLC can be mounted on a wall thanks to three holes. To ensure it is properly fastened, screws must be inserted in said holes. Before mounting the device on the wall, remove the protective case.

The following image shows the position of the fastening holes:

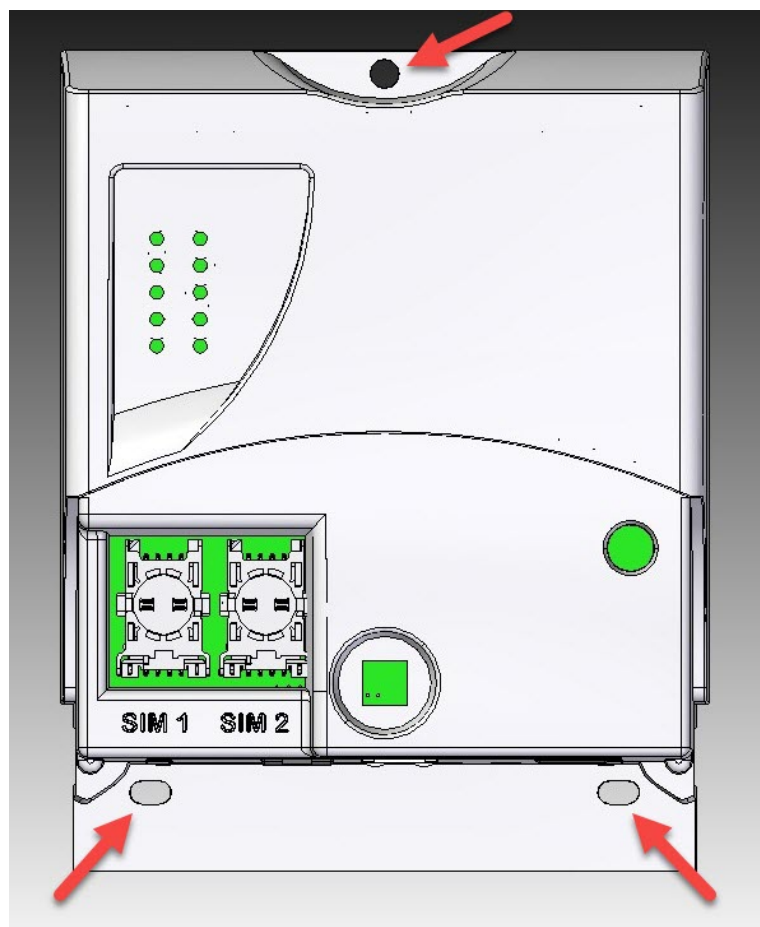


Fig. 13: Holes for wall mounting.

Chapter 4 Connecting the Router

This chapter describes how to connect the Regesta Smart PLC router to Ethernet devices and networks. The chapter contains the following sections:

- [Power source](#) on page 18.
- [Data connections](#) on page 19.
- [Installing the SIM card](#) on page 24.
- [RST button](#) on page 26.
- [Troubleshooting](#) on page 27.
- [Updating the software](#) on page 28.

4.1 Power source



Note

Please read the following instructions carefully before connecting the router!

4.1.1 Power connector pins

The power connector is located on the connector panel.



Fig. 14: Power Supply Connector

The power connector on this router is a **5.08 mm pitch 2-wire terminal block**.

There is no assignation for Phase and Neutral signals.

4.1.2 Power connector cable

**Warning**

The power cable is not supplied with the router. The estimated peak consumption for 230V AC operation is 100 mA. Any cable with a cable gauge equal to, or greater than, a 0.75 mm² section (AWG18 conductor) that is approved by IEC 60227 is acceptable.

**Warning**

All interconnected communication devices should be plugged to THE SAME GROUNDED POWER OUTLET, which should at the same time be of good quality (lower than 10 ohms).

Connecting all data devices to the same power source is strongly recommended regardless of whether the workplace is provided with an uninterrupted power supply (UPS), a regulated supply or is independent of other power supplies (such as lighting, etc.). This will help prevent malfunctions and premature aging of the drivers and other components.

4.1.3 Connecting

- Ensure that the power supply is NOT connected to either the electricity supply or the router.
- Connect all data cables.
- Connect the power supply cable to the device.
- Install the protective case for connectors.
- Connect the power supply cable to the electricity supply.

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 PLC has the following data connections.

4.2.1 LAN connection

The Regesta Smart PLC incorporates one 10/100/1000 BaseT Gigabit Ethernet port with automatic MDI/MDIX to connect to a local area network (LAN).

Please pay careful attention to the labeling to avoid mistaking this port for other types of ports:



Fig. 15: LAN Port

4.2.2 WAN connections

The Regesta Smart PLC has one Ethernet COMBO Gigabit interface for WAN connection. This port has 2 connectors - SFP for an optical link and RJ-45 for a 10/100/1000 Base-T link - but they cannot work simultaneously.

Please pay careful attention to the labeling to avoid mistaking this port for other types of ports:



Fig. 16: WAN and SFP connectors

4.2.2.1 Laser information



Choose SFP transceivers that meet the following regulations

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



Warning

Laser Radiation. Do not use optical instruments directly or without proper protection. CLASS 1 LASER PRODUCT.

The SFP modules to be installed in the card socket should be class 1 devices that comply with the IEC/EN 60825-1:2007 standard.

4.2.3 PLC connection

The Regesta Smart PLC incorporates a Power Line Communication (PLC) interface. This interface allows the device to communicate with several compatible PLC devices through the power line. PLC signal injection is made inside the device through the power supply connector. There is a LED labeled "P" to indicate the connection state.



Fig. 17: PLC and Power connector

4.2.4 WWAN antenna connections (RF connectors)

The Regesta Smart PLC router, depending on the model, has two connectors for RF antennas. To assemble and disassemble the antennas, simply screw them into the connectors labeled RF1/RF2 (located on the device's connector panel).

The RF1 connector is connected to the module's MAIN connector and the RF2 connector to the AUX connector.

Installing these antennas in the Regesta Smart PLC router is necessary to improve the quality of the signal received and transmitted by the WWAN module.

Some cellular technologies use the antenna diversity technique to improve the quality of the signal received (HSPA, LTE, etc.). Because of this, the Regesta Smart PLC incorporates two WWAN/RF connectors. Regardless of the configuration, the antenna on RF1 must be always installed while installing the one on RF2 is optional.



Fig. 18: WWAN Antenna Connectors

When the RF1 and RF2 antennas are not directly connected to the router but installed through extension cords, the minimum distance between them must be 7 cm. The maximum recommended distance between the two antennas is 25 cm. In order to comply with EMC regulations, the extension cable must not be longer than 3 m.

To achieve an optimum performance, the radio frequency accessories installed (antennas and cables) should be those recommended by Teldat.

Teldat offers a series of accessories (90° mount antennas, antennas for outdoor installation, antennas for ceiling installation, extension cables, etc.) that allow you to install the devices in different locations.

4.2.4.1 Placing the antenna

Antenna orientation, its location with respect to other wireless devices and radiation devices, such as communication devices, personal computers, etc., can significantly influence device performance.

Antennas transmit and receive radio signals. Performance is also affected by environmental factors such as distance between the device and the base station, physical obstacles and other interferences due to radio frequencies (RF).

For optimum coverage, carry out the following instructions:

- Whenever possible, place the antenna where there are no physical obstacles. Obstacles between the antenna and the base station degrade the wireless signal. Place the antenna above ground level facing the nearest base station.
- Density of materials also affects antennas. Place them away from any type of wall, metal screens, mirrors, etc.
- Do not place the antenna near columns, which may throw shadows and reduce the coverage area.
- Keep the antenna away from metal pipes such as those used for heating, air-conditioning, etc.
- Please bear in mind that other wireless devices such as telephones, microwaves, etc., can temporarily interfere with the quality of the radio signal.
- We do not recommend installing antennas near, or between, racks containing communication devices, computers, etc. Use an extension cable and place the device outside.

The following recommendations are applicable to all wireless devices:

- Do not touch or move the antenna while the device is transmitting or receiving.
- Do not touch any equipment containing devices that radiate, where the antenna is very close to or touching any exposed part of the body (particularly the face and eyes), when it is transmitting.
- Do not install the device in areas where the atmosphere is potentially explosive.
- Wireless devices can cause interference with other devices. Do not use the device in areas where medical equipment is installed.
- To ensure the RED 2014/53/EU directive is complied with, the device must be at least 20 cm away from a person's body when operating.

4.2.5 Serial port connections

The Regesta Smart PLC includes three RJ45 connectors to provide serial ports. Depending on the model, the two RJ45 connectors, labeled as Serial, may be inoperative.

4.2.5.1 Console connector as serial port (CONF connector)

It's possible to convert the console port into an RS-232 asynchronous DCE serial port. This port has the following characteristics:

- (1) DCE port.
- (2) RS-232 norm.
- (3) Maximum speed of 115200 bps.
- (4) Only the following signals are available: RxD, TxD and GND. See [Configuration connector](#) on page 34 for more information about pin assignment.
- (5) RJ45 connector.



Fig. 19: Console connector

4.2.5.2 Asynchronous serial ports

The Asynchronous Serial Port feature is optional and requires the addition of some hardware elements. Some models are equipped with 2 additional serial ports. The Regesta Smart PLC includes two RJ-45 connectors to provide these serial ports. This connector may not work, depending on the model. Check the label to verify whether serial ports are included on the device, and their type.



Fig. 20: Asynchronous Serial connectors

These serial ports can be either RS-232 and/or RS-485/RS-422. They have the following characteristics:

4.2.5.2.1 RS-232 serial port

- (1) DCE port.
- (2) Maximum speed of 115200 bps.
- (3) Control signals available. See [RS-232 serial port connectors](#) on page 34 for more information about pin assignment.
- (4) RJ-45 connector.

4.2.5.2.2 RS-485/RS-422 serial port

- (1) 2/4 wires configurable through software.
- (2) Bus termination configurable through software. See [RS-485 serial port connectors](#) on page 35 for more information about pin assignment.
- (3) Maximum speed of 115200 bps.
- (4) RJ-45 connector.

4.3 Installing the SIM card

The Regesta Smart PLC has a Wireless WAN interface that, in order to operate, may require at least one SIM card to be inserted into the device. There are certain services (CDMA) provided by several operators in some countries that do not require SIM cards. The Regesta Smart PLC has two SIM trays. Both trays are located under the device's protective case and are labeled SIM1 and SIM2. In installations where only one SIM card is required, we recommend installing it in the main SIM1 tray.



Warning

Never install the SIM cards when the device is switched on.

Always disconnect the device from the main power supply before installing the SIM cards.

Always disconnect the device before removing the connector protective casing to access the trays.

When inserting the SIM cards, please protect yourself against electrostatic discharges (ESD).

Do not touch the SIM card connectors.

To access the SIM trays, you need to remove the protective case. Please refer to [Removing/Installing the connector protector](#) on page 13 to learn how to remove the casing.

4.3.1 Identifying the SIM trays

Once you have removed the case, you will be able to see the different elements illustrated below.

The Regesta Smart PLC incorporates 2 SIM cards, which allow you to execute some special configurations. For example, when installing two SIM cards one can be used as backup. To carry out this type of configuration, you must assign a tray to each SIM (since they require different configuration parameters).

The SIM trays are identified as SIM1 and SIM2 (i.e., socket 1 and socket 2).



Fig. 21: Location of the SIM1 and SIM2 trays

4.3.2 Procedure to install the SIM

Once the appropriate SIM is selected, carry out the following steps:

- (1) Push the fastening in the direction indicated by the arrow and the word *OPEN*.
- (2) Open the upper part of the tray.
- (3) Fully insert the SIM card using the guides; the SIM's notch must be on the right side (as shown).
- (4) Return the tray to its original position.
- (5) While pressing on the tray, push the fastening towards the word *LOCK* until it is firmly in place.

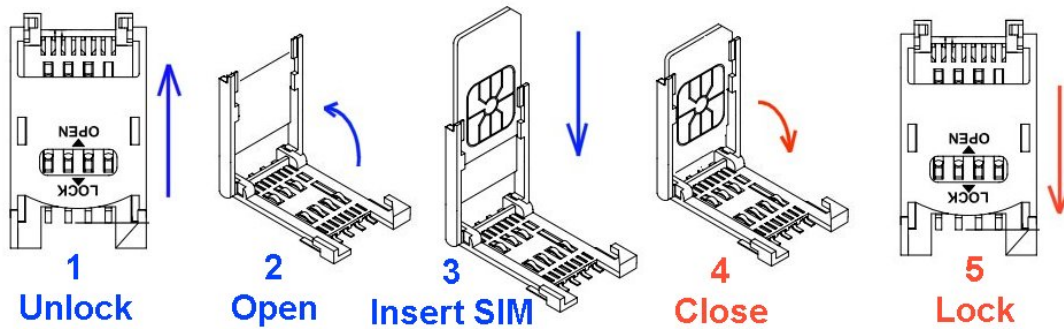


Fig. 22: Inserting the SIM in the internal tray

4.4 RST button

The Regesta Smart PLC has a button that can be accessed from the outside and is labeled “RST”. It is located on the connector panel and has two functions.

- To trigger a reboot.
- To restart the device with the default configuration. The default configuration has IP 192.168.1.1 assigned to all switch ports.

The external button is physically protected so it cannot be accidentally pushed. You need a sharp-pointed object to activate it.

4.4.1 Restarting the device

Carry out the following steps to restart the device:

- (1) Press the RST button. Device restart is indicated by the S, C and L LEDs in the off state and the ON LED lighting in green.
- (2) Stop pressing the RST button as soon as the S, C and L LEDs go to off state.
- (3) The device will begin the restart with LEDs S and C off and LEDs L and ON in green.

4.4.2 Default configuration

By following these steps, the RST button allows you to boot the device with its default configuration:

- (1) Press the RST button. Device restart is indicated by the S,C and L LEDs in off and the ON LED lights up in green.
- (2) Keep pressing the RST button. The S LED flashes green and the L LED lights up in green while you are still pressing the RST button. This state indicates the device configuration has changed to the default configuration.
- (3) Stop pressing the RST button to allow the device to restart.
- (4) The device will begin the restart with LEDs S and C off and LEDs L and ON in green.
- (5) As the device now has the default configuration, you can access it through the IP (bearing in mind that the default address for the equipment is 192.168.1.1 and that it is accessible from any switch port).

4.5 Dying gasp alarm

The Regesta Smart PLC can be equipped with an optional board that allows an alarm to be sent in the event of a power failure or removal of the power supply cable.

At 10 W power consumption, the device stays powered for 6 seconds, allowing the alarm to be sent through any active interface.

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

To do this, carry out the following steps:

- (1) Configure the ELS to enable the GW.075 event as Trace, Syslog event or snmp-trap.
For further information on ELS, please see manual: "Teldat *Dm704-I Configuration and Monitoring*".
- (2) Configure the SNMP protocol, host and sending parameters if required.
For further information on SNMP configuration, please see manual: "Teldat *Dm712-I SNMP Agent*".
- (3) Configure and enable the Syslog feature and server if required.
For further information about the Syslog feature, please see manual: "Teldat *Dm753-I Syslog Client*".

4.6 Troubleshooting

The following table can help you solve problems when installing the device. If you cannot solve the problem, contact your dealer for more information.

Symptom	Solution
None of the LEDs light up on the router.	Check the power supply to the router (power source, main power outlet).
The local console does not respond.	<p>Check the console cable is the right one and it is connected to the device and the asynchronous terminal.</p> <p>Check the terminal has the correct port configured.</p> <p>Check the terminal configuration is 115200 8N1.</p> <p>Check that the console is not executing an events process.</p>
The local console only displays rubbish.	<p>Check the terminal has the correct port configured.</p> <p>Check the terminal configuration is 115200 8N1.</p>
You have forgotten the access password for the router.	Ignore the configuration through the RST button (as explained in the relevant section).
Date and time in the device are lost when restarted.	Parameters configured through the time set command will be lost when the device restarts. Use the NTP protocol to keep the date and time configuration.
The LAN, WAN or SFP do not light up in green.	<p>Check the Ethernet cable, or Fiber, and the connection to the network (you may need a crossover cable).</p> <p>For further information, please see manual: "Teldat <i>Dm709-I LAN Interfaces</i>".</p>
The S LED is red.	<p>Check the SIM card has been inserted correctly,</p> <p>or</p> <p>Check the SIM PIN is correct,</p> <p>or</p> <p>Check the antenna is properly installed (been screwed in correctly),</p> <p>or</p> <p>Get your technical service to check the device is in the optimum position for the service.</p> <p>For further information, please see manual: "Teldat <i>Dm781-I Cellular Interface</i>".</p>

4.7 Updating the software

The Regesta Smart PLC router can be updated to new releases. Please contact your distributor for further details on new releases.

There are various ways to update one of our routers: For further information, please see manual *Dm 748-I Software Updating*.

The software required to update one of our routers is supplied in a format known as **distribution**. This consists of a single file, which contains all the files needed to update your device as well as in-depth information on the contents of the files.

The Regesta Smart PLC incorporates independent modules for the Wireless WAN interface. You can pick modules from different manufacturers or choose several modules from the same provider, depending on the technology used. Generally, the firmware is independent from the device's software. There is an UPGRADE file for each Wireless WAN module. Please ask your distributor for the correct UPGRADE file (according to the module in your device). The manual describing the Cellular interface (Dm781-I) explains how to upgrade the module.

The Regesta Smart PLC also incorporates a PLC module, which needs its own firmware. This PLC module can operate in several modes. To change operating mode, you usually need to change the PLC firmware. This firmware is independent of all other software in the device. Please ask your distributor for the correct PLC UPGRADE file. The manual describing the PLC Gateway (Dm 823-I) explains how to upgrade the module.

4.7.1 Connecting to the router

There are two ways of accessing the device CLI:

- Through the CONF connector.
- Through the Telnet protocol.

4.7.1.1 Connecting through the local console (CONF connector)

The Regesta Smart PLC has a RJ.45 female connector on the front panel known as CONF., which provides access to the device local console. To configure this, connect the CONF. port to an asynchronous terminal (or to a PC with terminal emulation).

- Speed: 115200 bps.
- Eight data bits.
- One stop bit.
- No parity bit.
- No type of flow control.

To connect to the configuration port, use the RJ45 cable (provided with the router) and the female RJ45-female DB9 adapter (also provided with the router). If the terminal has DB25 connectors, an additional adapter will be needed.

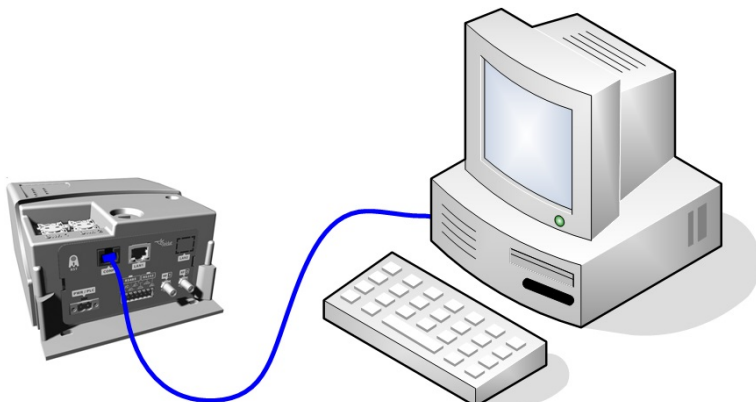


Fig. 23: Connecting for configuration

4.7.1.2 Connecting through an IP terminal (LAN connector)

The Regesta Smart PLC includes a default configuration that activates if you haven't preconfigured anything.

The router's default configuration establishes the following IP address and access mask:

- IP address: 192.168.1.1
- IP mask: 255.255.255.0



Note

Some devices leave the factory with customized settings. This personalization can mean that the default configuration is different from the one shown above.

This initial configuration allows you to access the device configuration console through the Telnet IP protocol. To do this, carry out the following steps:

- Configure the IP terminal (normally a PC) Ethernet interface with an IP address within the range [192.168.1.2, 192.168.1.254] and with mask 255.255.255.0. For example, 192.168.1.2, 255.255.255.0.
- Connect the IP terminal Ethernet interface to the Regesta Smart PLC LAN connector through the Ethernet cable (RJ45) provided.
- Initiate a Telnet session from the IP terminal to IP address 192.168.1.1 (Regesta Smart PLC default address).
- The default configuration does not ask for credentials (user/password) to access the console.


Chapter 5 Compliance

5.1 Manufacturer information

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

5.2 Intended use of the equipment

The Regesta Smart PLC is an industrial router. Operation of this equipment in a residential environment could cause radio interference.

	<p>Warning</p> <p>The Regesta Smart PLC is a permanently connected Class II device. Pursuant to safety regulations on electrical overloads, the device must be connected to the main power supply through a 1 amp min thermal magnetic circuit breaker that carries the CE marking.</p>
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5.3 EC declaration of conformity (non-radio version)

English (EN)	<p>Hereby, Teldat S.A. declares that telecommunications equipment Regesta Smart PLC complies with:</p> <p>Directive 2014/30/EU (EMC)</p> <p>Directive 2014/35/EU (LVD)</p> <p>Directives 2011/65/EU and 2015/863/EU (RoHS)</p> <p>of the European Parliament and of the Council.</p>
Spanish (ES) Español	<p>Por la presente, Teldat S.A. declara que el tipo de equipo de telecomunicaciones Regesta Smart PLC es conforme con:</p> <p>Directiva 2014/30/UE (EMC)</p> <p>Directiva 2014/35/UE (LVD)</p> <p>Directivas 2011/65/UE y 2015/863/UE (RoHS)</p> <p>del Parlamento Europeo y del Consejo.</p>

The EC declaration of conformity and additional product documentation can be accessed here:

<http://www.teldat.com/conformity>

5.4 EC declaration of conformity (radio version)

English (EN)	<p>Hereby, Teldat S.A. declares that radio equipment Regesta Smart PLC complies with:</p> <p>Directive 2014/53/EU (RED)</p> <p>Directives 2011/65/EU and 2015/863/EU (RoHS)</p> <p>of the European Parliament and of the Council.</p>
Spanish (ES) Español	<p>Por la presente, Teldat S.A. declara que el tipo de equipo radioeléctrico Regesta Smart PLC es conforme con:</p> <p>Directiva 2014/53/UE (RED)</p> <p>Directivas 2011/65/UE y 2015/863/UE (RoHS)</p> <p>del Parlamento Europeo y del Consejo.</p>

The EC declaration of conformity and additional product documentation can be accessed here:

<http://www.teldat.com/conformity>

5.5 CE marking

This equipment is in conformity with the CE procedures and marking.



5.6 National restrictions

In accordance with Article 10 of 2014/53/EU, we inform you that national restrictions and requirements may apply when it comes to authorization. These can evolve with time. Teldat S.A. recommends that you check with local authorities for the latest status of national regulations.

5.7 Operating frequency

For the operating frequencies working in the device, see Appendix *Radio Information* on page 38.

5.8 REACH

In compliance with the REACH Candidate List, the delivered product and product packaging do not contain chemical substances above a concentration limit of 0.1% weight by weight (w/w). This declaration will be updated whenever any changes occur or other chemical substances are added to the REACH Candidate List. Information is currently provided to consumers upon request.

5.9 WEEE information



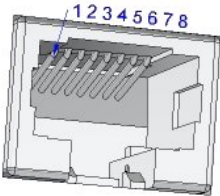
The crossed-out wheellie bin symbol indicates that the device must be disposed of separately from normal domestic waste at an appropriate waste disposal facility at the end of its useful service life.

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.

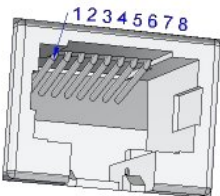
Appendix A Technical Information

A.1 Connectors

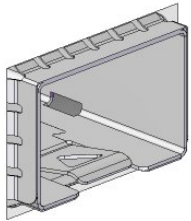
A.1.1 LAN connector

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 WAN base-T connector


RJ45 WAN	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.1.3 WAN SFP connector

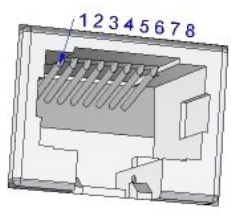
SFP	
	Standard SFP connector

A.1.4 WWAN/RF connectors

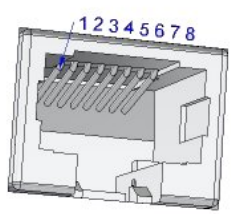
Devices equipped with this interface have two SMA female connectors installed.

SMA Female	PIN	ANT
	Internal	RF in/out
	External	GND

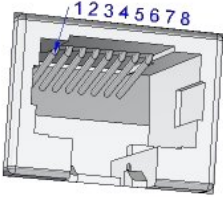
A.1.5 Configuration connector

RJ45 CONFIGURATION	PIN	CONF
	1	--
	2	RxD
	3	GND
	4	--
	5	--
	6	GND
	7	TxD
	8	--

A.1.6 RS-232 serial port connectors

RJ45	PIN	SERIAL
	1	RTS
	2	DTR
	3	TxD
	4	GND
	5	CD
	6	RxD
	7	DSR
	8	CTS

A.1.7 RS-485 serial port connectors

RJ45	PIN	SERIAL
	2	2H_R/TX-_4H_TX-
	3	2H_R/TX+_4H_TX+
	6	4H_RX+
	7	4H_RX-

A.1.8 Power supply connector

2 wire 5.08 mm pitch terminal block	Phase and Neutral connectors without assignation
--	--

A.2 Technical specifications

A.2.1 Hardware architecture

MEMORY	128 Mbytes in SDRAM.
STORAGE UNIT	FLASH Memory (32 Mbytes).

A.2.2 PRIME PLC interface

PROTOCOL	PRIME 1.3.6 and PRIME 1.4 depending on the firmware uploaded.
ROLE	Base Node
COMMUNICATIONS	Single phase injection: PRIME 1.3 CENELEC A band. PRIME 1.4 Multiband (CENELEC, FCC and ARIB) bands
TECHNOLOGY	MicroChip ATPL360 chipset.
CONNECTOR	Terminal Block 2 Poles 5.08 mm pitch, is the same as power supply.

A.2.3 LAN interface

PROTOCOLS	Ethernet (802.3).
PORTS	1 port with MDI/MDX auto detection.
SPEED	10/100/100 Mbps (BaseT).
CONNECTOR	RJ-45 female.
ISOLATION	Standard for E1 interface (1.5 KV).

A.2.4 WAN base-T interface

STANDARDS	Ethernet (802.3).
PORTS	1 port with MDI/MDX auto detection.
SPEED	10/100/1000 Mbps (Base-T).
CONNECTOR	RJ-45 female.
ISOLATION	High isolation for E2 (up to 10 KV).

A.2.5 WAN SFP 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 connector.

A.2.6 Wireless WAN interface

WWAN Standard/Bands	EC25-E: <ul style="list-style-type: none"> • LTE: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • LTE Cat 4. <ul style="list-style-type: none"> • FDD: 150Mbps/50Mbps • TDD: 130Mbps/35Mbps • HSPA+ Cat 24/6: 42Mbps/5.76Mbps • EDGE: 236Kbps
CONNECTOR	Two RF SMA female connectors. (Optional).
SIM Slots	2 Mini-SIM (2FF) ISO/IEC 7810:2003, ID-000 (1.8V / 3V)

A.2.7 Configuration interface

LOCAL TERMINAL	V.24 115200-8-N-1-without flow control.
CONNECTOR	RJ-45 female on the device's connector panel.

A.2.8 RS-232 serial interface

STANDARDS	RS-232. Asynchronous serial port with control signals.
SPEED	From 300 to 115200 bps.
CONNECTOR	RJ-45 female on the device's connector panel (optional).

A.2.9 RS-485 serial interface

STANDARDS	2-4 wire RS-485/RS-422 configurable through software. Bus termination configurable through software.
SPEED	From 300 to 115200 bps.
CONNECTOR	RJ-45 female on the device's connector panel (optional).

A.2.10 Power supply specifications

NOMINAL	110-240 V AC.
ABSOLUTE MAXIMUM	85-264 V AC.
FREQUENCY	50-60 Hz
MAXIMUM POWER	10 W
CONNECTOR	Terminal Block 2 Poles 5.08 mm pitch.

A.2.11 Dimensions and weight

TYPE	Plastic ruggedized casing with optional DIN rail mount.
LENGTH x WIDTH x HEIGHT	140 x 80 x 190 mm.
WEIGHT	1 Kg.

A.2.12 Environmental specifications

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

Appendix B Radio Information

B.1 RF WWAN specifications

The Regesta Smart PLC model with the EC25 module provides connectivity for networking over several radio frequency bands under 3GPP Standards.

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

This product is supplied without any antennas. Choosing antennas is at the discretion of the operator, but said party is responsible for fulfilling the local regulations.

Technology: LTE.

Bands	Frequencies	Conducted Transmit Power
Band 1	Tx: 1920-1980 MHz Rx: 2110-2170 MHz	+23 dBm \pm 2 dB
Band 3	Tx: 1710-1785 MHz Rx: 1805-1880 MHz	+23 dBm \pm 2 dB
Band 7	Tx: 2500-2570 MHz Rx: 2620-2690 MHz	+23 dBm \pm 2 dB
Band 20	Tx: 832-862 MHz Rx: 791-821 MHz	+23 dBm \pm 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 \pm 2 dB +27 dBm \pm 3 dB
DCS 1800 (1800 MHz)	Tx: 1710-1785 MHz Rx: 1805-1880 MHz	+30 dBm \pm 2 dB +26 dBm \pm 3 dB