MuLOGIC

RSA-SERIES

INDUSTRIAL REMOTE ACCESS ROUTERS

Hardware and start-up guide
Issue 1.1
February 2025

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RSA-series Industrial Remote Access Routers

Compliances

CE Compliance

- EMC: Directive 2004/108/EC (EN 55022, EN55024)
- Safety: Directive 2006/95/EC (EN 60950)

The RSA series of routers complies with EMC directive 2004/108/EC and is classified for use in Residential areas. Test standard: EN 55022 Class B

The RSA series also complies with the Immunity standard for ITE equipment EN 55024 with the applicable test levels increased to levels compatible with Industrial standards (ref. EN 61000-6-2).

About this user guide

Although this user guide was written with greatest possible care, omissions and errors cannot be precluded.
MuLogic BV accepts no liability for any inaccuracies that may be found.
However, if you have comments or suggestions about this guide, please don't hesitate to contact us in order to help us to improve our product documentation.

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Contents

Introduction

Supported models in this user guide

Series Models	Eth ports	SFP port	ADSL2+	VDSL2	RS232 port	RS485 port	USB ports	2G WWAN	3G WWAN	4G WWAN	Dual SIM	Casing
RSA-M1 (Obsolete)												
RSA-1120D	1	-	✓	-	✓	✓	-	-	-	-	-	Plastic
RSA-1020D	1	-	-	-	✓	✓	-	✓	✓	–	-	Plastic
RSA-1120M	1	-	✓	-	✓	✓	-	-	-	-	-	Metal
RSA-1120W4	1	-	✓	-	✓	✓	-	✓	✓	✓	-	Metal
RSA-4122	4	-	✓	-	✓	✓	2 x USB2.0	-	-	-	-	Metal
RSA-4122W(3)	4	-	✓	-	✓	✓	2 x USB2.0	✓	✓	–	-	Metal
RSA-4122W4	4	-	✓	-	✓	✓	2 x USB2.0	✓	✓	✓	-	Metal
RSA-M2												
RSA-1220D	1	-	✓	-	✓	✓	-	-	-	-	-	Plastic
RSA-1020DW4	1	-	-	-	✓	✓	-	✓	✓	✓	-	Plastic
RSA-1220M	1	-	✓	✓	✓	✓	-	-	-	-	-	Metal
RSA-1220W4	1	-	✓	✓	✓	✓	-	✓	✓	✓	-	Metal
RSA-4222	4	-	✓	✓	✓	✓	2 x USB2.0	-	-	-	-	Metal
RSA-4222W4	4	-	✓	✓	✓	✓	2 x USB2.0	✓	✓	✓	(✓)*	Metal
RSA-4222WU	4	-	✓	✓	✓	✓	2 x USB2.0	-	-	LTE450	(✓)*	Metal
RSA-M4												
RSA-4422	4	-	✓	✓	✓	✓	2 x USB3.0	-	-	-	-	Metal
RSA-4422W4	4	-	✓	✓	✓	✓	2 x USB3.0	✓	✓	✓	✓	Metal
RSA-4422WU	4	-	✓	✓	✓	✓	2 x USB3.0	-	-	LTE450	✓	Metal
RSA-5422	5	-	✓	✓	✓	✓	2 x USB3.0	-	-	-	-	Metal
RSA-5422W4	5	-	✓	✓	✓	✓	2 x USB3.0	✓	✓	✓	✓	Metal
RSA-5422WU	5	-	✓	✓	✓	✓	2 x USB3.0	-	-	LTE450	✓	Metal
RSA-6422	4	✓	✓	✓	✓	✓	2 x USB3.0	-	-	-	-	Metal
RSA-6422W4	4	✓	✓	✓	✓	✓	2 x USB3.0	✓	✓	✓	✓	Metal
RSA-6422WU	4	✓	✓	✓	✓	✓	2 x USB3.0	-	-	LTE450	✓	Metal

Note. All RSA-4222W4 and RSA-4222WU units supplied after July 2024 are dual SIM versions.
The RSA-4222WD4 and RSA-4222WDU type indications have become obsolete.

Hardware Features

- DSL port supports ADSL, ADSL2, ADSL2+ and VDSL2.
- One hardware version for ADSL Annex A and Annex B.
- SFP port with 1.25 Gbit/s SGMII and SERDES interface.
  It supports SFP modules and SFP+ modules with fallback to SGMII.
- SFP interface supports DDM/DOM identification and diagnostics.
- Ethernet ports of RSA-M1/M2 models support 10/100BASE-T and Auto-MDI/MDIX.
- Ethernet ports of RSA-M4 models support 10/100/1000BASE-T and Auto-MDI/MDIX.
- IEEE 802.1Q VLAN support for VDSL2/PTM, LAN and WAN Ethernet interfaces.
- Two serial ports (one RS-232, one RS-485) for data rates from 300 to 115200 bit/s.
- Two USB 2.0 ports (RSA-M1/M2) or USB 3.0/USB 3.2 Gen1 (RSA-M4) for connecting external USB WWAN modems, memory devices, serial ports and other peripherals.
- Optional internal USB2.0 port on RSA-M4 models.
- Dry contact sensor (input) and dry contact (output) for status/alarm indication and remote control.
- USB power outputs can be utilised and controlled as independent 5VDC outputs.
- Isolated supply voltage input for industrial applications (suitable for low Voltage AC and DC).
- Extended operating temperature range: -40°C to +70°C.
- Rugged metal enclosure for DIN-rail or panel mounting.
- Some models (D-versions) available in compact plastic enclosure for DIN rail or panel mounting.

Hardware Details and Installation

LED Indicators

The LED indicators display the status of the various ports and functions of the unit. In case a communication problem occurs, these LEDs can help you determine the cause of the problem.

LED	Description
PWR	Indicates that the unit is powered on and functions correctly. After start-up, this LED briefly blinks once per second to indicate the “alive” signal sent to the system watchdog.
ALM[1]	Indicates a System Alert.
DSL[2]	Indicates the ADSL link status. This LED blinks slowly when the remote DSLAM is detected and blinks rapidly during the training stage. When the ADSL link is established the LED will be on continuously.
PPP[1]	Indicates that a WAN IP connection is established.
REG[3]	Indicates registration with the Mobile network.
NET[3]	Indicates that a WWAN IP connection is established.
WRL	Indicates the WWAN link status. This LED blinks shortly every 2 seconds when registered on the mobile network. The LED will blink during establishment of a data connection and will be on continuously when the data connection is established.
L1..L5[3]	Indicate signal level
VPN	Indicates that one or more VPN tunnel connections are established.
RxD	Flashes when the unit sends data to the device connected to the serial port. (RS-232 and/or RS-485)
TxD	Flashes when the unit sends data to the device connected to the serial port. (RS-232 and/or RS-485)
DCD	Indicates that the serial port is in use. (RS-232 and/or RS-485)
DTR	Indicates that the RS-232 DTR input is active (high).
Eth LEDs	Green: Indicates Ethernet Link established. Blinks on activity. Yellow: Indicates link speed 1Gbit/s or 100Mbit/s.
SFP LEDs	Green: Indicates Fiber or Ethernet Link established. Yellow: Indicates that SFP module has been detected. Blinks on error.
USB 1/2	The USB 1 and USB 2 LEDs indicate that the power of the USB port is switched on[4].

Note 1. Not present on D-models (plastic enclosure).
Note 2. Not present on models without xDSL support.
Note 3. Only present on RSA-1020D and RSA-1020DW4.
Note 4. USB data ports will be active regardless of USB power.

Controls

Reset button

The reset button is positioned behind the tiny hole near the ground terminal screw on the front panel or on the lower side of the plastic “D-enclosures”. The button can be used to restart the unit, enable the serial console port and to restore the factory default or custom default settings.

Restart

The unit can be restarted by pressing the reset button for 1 second.

Serial RS-232 port console mode

The serial RS-232 port is normally used for the internal serial port gateway. However, for configuration without IP network access or for maintenance purposes, the serial port gateway can be disabled and command line access is enabled via the serial port.

To enable the serial port console mode, press and hold the reset button while connecting the power. Then release the reset button. After the system is started up, the DCD LED will go on to indicate that the port is in console mode.
The data rate and format is 115200bit/s ,8 data bits, No parity.
See page 11 for details of the RS232 port.

Reset to Factory default or custom default settings

If no custom default settings are stored, the system resets to factory defaults in the following manner:

RSA-M1/M2 models: Wait at least 60 seconds after the unit is powered on. Press and hold the reset button for more than 5 seconds until the PWR, DSL, PPP and VPN LEDs start blinking. Then release the reset button.

RSA-M4 models: wait at least 60 seconds after the unit is powered on. Press and hold the reset button for more than 5 seconds until the PWR, DSL, PPP and VPN LEDs all are On. Release the button when these LEDs go Off.

If custom default settings are stored, this procedure resets the settings to those defaults.

Reset to Factory default settings when custom default settings are stored

When custom default settings are present (custom defaults settings are made by the user, not the factory), the procedure as described below will force a reset to the custom default settings.

RSA-M1/M2 models: Wait at least 60 seconds after the unit is powered on. Press and hold the reset button for more than 30 seconds. Then release the reset button.

RSA-M4 models: Wait at least 60 seconds after the unit is powered on. Press and hold the reset button for about 30 seconds until the PWR, DSL, PPP and VPN LEDs have gone On and Off for the 2nd time. Then release the reset button.

The factory default settings are:
- **IP address**: 192.168.1.1
- **User name**: admin
- **Password**: rsa-admin

Connectors

Power connector

The operating power of the RSA series is supplied at pins 1 and 2 of the PWR screw terminal connector. The voltage range depends on the model and is indicated by the "Vr suffix":

Vr1: **RSA-M1/M2:** 11-36 VDC, 11-28 VAC. **RSA-M4**: 10-36VDC, 22-26VAC.

Vr2: 18-60 VDC, 18-28 VDC (Vr2 not available for RSA-M4 models).

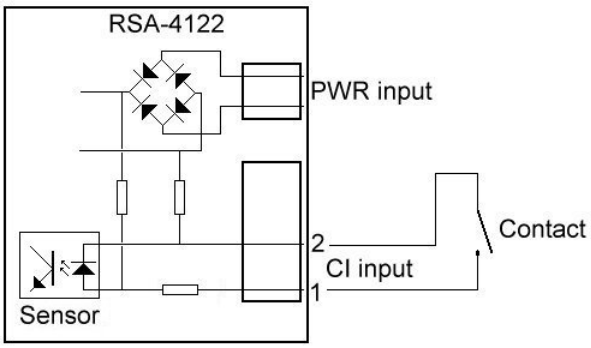
Vr3: 18-72 VDC, (no AC).

Note. *The power input of the unit is not polarised.*
You can connect DC power (+/- or -/+) in either way.

I/O connector

Input

Pins 1 and 2 (marked CI) of the I/O connector are connected to a dry contact sensor.



Status changes of this input can be monitored via one of the management services or reported via one of the system alerts:
Email, SNMP-trap, SMS, or read by means of an SNMP-Get.

- Maximum closed contact current (depending on PWR voltage): 6 mA[1].
- Maximum loop resistance (contact plus cable): 100Ω[1].

1. These figures may be different on RSA-M1 models.

Note. *Only use this input for "dry contacts" like the contact of a switch or relay.*

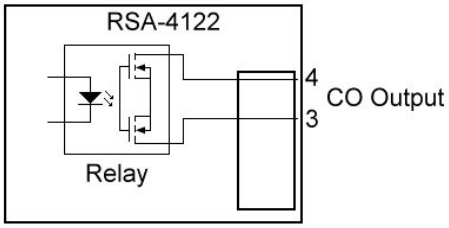
Caution: *Do not connect to any power source, including the unit's power source, nor apply any voltage to the input pins. The contact inputs are galvanically connected with the unit's power input.*

Output

Pins 3 and 4 (marked CO) of the I/O connector are connected to an internal relay contact (electronic solid state relay). The relay contacts are galvanically isolated from the device and power input.

The contact state (open/closed) can be controlled by means of an SNMP set, http request or selected as system alert output.

- Maximum load voltage: 100V
- Maximum load current: 150mA
- Maximum On-resistance: 8Ω.
- Isolation Voltage: 1500 Vrms.



RS-485 connector

Pin	Description	Direction	
		Input	Output
1	Rx– Receive data input, negative [2]	●	
2	TR– Transmit/Receive data, negative	●	●
3	TR+ Transmit/Receive data, positive	●	●
4	Rx+ Receive data input, positive [2]	●	

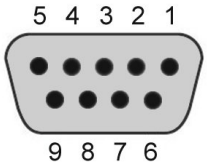
- A 2-wire RS-485 connection is made to pins 2 and 3.
- Pins 1 and 4 are RS-485/RS-422 “Rx” inputs used in 4-wire RS-485/RS-422 mode. (Note 2).
- Pins 2 and 3 are used for 2-wire RS-485 or as “Tx” outputs in 4-wire RS-485/R422 mode.

Note 1: *The RS-485 output/inputs are not terminated. In general, termination resistors are not necessary for short lines (up to 10 meters or 30 feet) and data rates up to 19,200 bps.*

Note 2: *The receive data input connector pins 1 and 4 are biased with 10kΩ. When not used (in 2-wire RS-485 mode) these pins can remain unconnected.*

RS-232 Connector

The RS-232 connector is of the type **DCE** (as used on a modem)**.** It can connect directly to a DTE type of serial port (as used on a PC) using a straight cable. For connection to another DCE port, a “cross cable” is needed. See page 26 for details.



Pin	V.24	Description	Input	Output
1	109	DCD – Data Carrier Detect		●
2	104	RxD – Received data		●
3	103	TxD – Transmitted data	●	
4	108	DTR – Data Terminal Ready	●	
5	-	Signal ground		
6	107	DSR – Modem ready (not used)		
7	105	RTS – Request to send	●	
8	106	CTS – Clear to Send		●
9	125	Rng – Ring indicator (not used)		

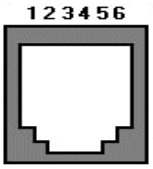
Notes:
The DCD output will become active when the port is in use by either the serial gateway (during IP connection) or when the port is in CLI or console mode.

The CTS output is used for flow control of the incoming (transmit) data.

The RTS input is used for flow control of the outgoing (receive) data.

The DTR input is used for indicating that an active DTE port is connected..

DSL Connector



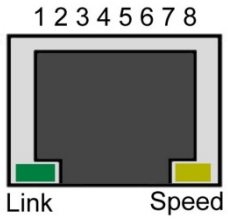
1 = Not connected
2 = Not connected
3 = DSL line wire a
4 = DSL line wire b
5 = Not connected
6 = Not connected

SFP Connector

LEDs

- **Link** (green): Indicates that the fiber or Ethernet module has an established link with a remote port..
  This LED will blink when there is data activity on this Ethernet port.
- **SFP present** (yellow): Indicates that an SFP module has been detected successfully. This LED will blink upon a SFP detection error.

Ethernet Connectors



1 = Tx+
2 = Tx-
3 = Rx+
4 = Not connected
5 = Not connected
6 = Rx-
7 = Not connected
8 = Not connected

LEDs

- **Link** (green): Indicates that an Ethernet device is connected with this port. This LED will blink when there is data activity on this Ethernet port.
- **Speed** (yellow): Indicates that the Ethernet link is running at 100mbit/s.

USB Connectors

The USB ports (USB 2.0 or USB3.0) are available for external flash memory devices, WWAN dongles, serial ports and other USB devices. Check with your supplier for a list of supported devices.

LEDs

The USB LEDs indicate the presence of power on the USB ports. The USB ports will remain activated regardless of the status of the USB power.

Antenna Connector

The antenna connector (W-versions only) is of the type “SMA”.
You can connect an antenna with SMA connector directly or use coaxial cable to an external antenna.

The used antenna and coaxial cable must have a characteristic impedance of 50Ω and must be matched for 900MHz/1800MHz/2100Mhz or 850Mhz/1900Mhz, depending on the frequency bands used by the cellular network operator.

SIM Card slots (W-versions only)

The SIM card sockets are located at the rear side of the metal enclosure or at the lower side of the plastic enclosures. See page 21 for instructions.

Installation

This chapter covers the hardware installation procedure.

Power connection

Connect the power cable to the screw terminal socket called PWR. The unit can be powered from low voltage DC or AC sources. The voltage range indication (Vr1, Vr2 or Vr3) is printed on the serial number label.
Refer to page 22 (Power supply) for specification of the voltage ranges.

Note. *The power input of the unit is not polarised. You can connect DC power in either direction.*

DSL line connection

If the line is used only for connecting the RSA unit and no telephony service is needed, then the line can be connected directly to the DSL connector.

A splitter must be added if, apart from the DSL service, POTS (PSTN) or ISDN telephone service is required.

Note. *Use the appropriate splitter for the telephone service:*
- a "POTS splitter" for use with traditional telephone service (ADSL Annex A).
- an "ISDN splitter" for use with ISDN service (ADSL Annex B).
For VDSL2 services, make sure that the splitter is suitable for VDSL2.

- Connect the outside telephone line (coming from the telephone exchange/DSLAM) with the splitter port called "LINE"
- Connect the splitter port called "Phone" with the telephone set or ISDN NT.
- Connect the splitter port called "Modem" or "DSL" with the LINE connector of the modem.

When properly connected to the line, the DSL LED of the modem shall start blinking within 1 minute after power-on. When the DSL connection is established, the DSL LED is On continuously. The actual Internet connection will not be established until the unit is configured with the correct parameters (like VPI/VCI, and ATM Encapsulation Protocol). These parameters are provided by your ISP.

Ethernet cable(s)

The Ethernet ports support 10/100BASE-T or 10/100/1000BASE-T, HD or FD with Auto-MDI/MDIX. The ports will automatically adapt to the operating mode of the connected device and will automatically make a straight or crossed connection.
When the unit is powered on and the Ethernet cable is properly connected between the unit's Ethernet port and the Ethernet device, the green (link) LED at the Ethernet connector unit will be on. When data passes over the Ethernet cable, this link will briefly blink.
When connected in 100BASE-T or 1000BASE-T mode, the yellow (speed) LED will be on. (On RSA-M4 models the LED can be configured to be Off while connected in 100BASE-T mode).

SFP modules

The unit supports SFP modules and SFP+ modules with SGMII (1,25 Gbit/s) fallback. When the SFP module is inserted properly and detected successfully The yellow LED will be On. The yellow LED will blink when the module is not properly detected. The module detection uses DDM/DOM. For SFP modules without this feature, the module detection can be disabled and the yellow LED will always be On when a module is inserted.

RS-232 connection

The RS-232 port of the unit is of the type “DCE”, which means that it has the pin-out and behaviour of a (DB9) serial port of a modem.

The port can be connected directly to the serial port of a PC using a straight “DB9-male to DB9-female” or “DB9-male to DB25-female” cable. It can also Connect directly to a USB-to-Serial converter cable.

For connecting to the serial port of another DCE device, a “crossed DB9-male to DB9/DB25-male” cable is used. See chapter 5.

RS-485 connection

The RS-485 port of the unit is factory configured for both 2-wire and 4-wire operation. This means that the RS-485 port can receive data from the RS-485 bus at both pins 1/4 and pins 2/3.

To disable the receive data input on pins 2/3, select “4-wire only” in the RS-485 port setup page. In “4-wire only” mode, pins 2 and 3 of the RS-485 connector are only used for transmitted data (like for an RS-422 interface) but still go into high impedance mode while not transmitting. This allows the 4-wire interface to be used for both point-to-point and multi-drop circuits.

Note.
The RS-485 inputs are biased with 10kΩ to the internal signal ground and 3,3V.

USB connection

The USB ports can be used to connect devices that support USB 1.0, USB 1.1 or USB 2.0 or USB3.0 (USB 3.2 Gen 1**)** on the RSA-M4 models.

It is good practice to connect USB devices before the unit is powered on.

Warning: Disconnecting a USB device while the unit is powered on, may result in an undefined state for both USB device (like memory devices) and the unit itself. It may render some functions of the unit to be defunct or may trigger an automatic restart.

SIM card insertion (W4-versions only)

The SIM card slots are located at the rear of the unit. See page 22 for instructions.

Note. *Make sure to enter the correct SIM PIN. When a wrong PIN is detected, no further action is taken is taken until the next restart of the unit.*
After 3 restarts with the wrong PIN, the SIM will be locked and the PUK code must be entered to unlock the SIM card.

Configuration access

Introduction

Configuration interfaces

The RSA series routers can be configured by means of:

- Web browser interface (HTTP or HTTPS).
- Command line interface (telnet, SSH or RS-232 port[1]).

Note 1. *command line access over the serial RS-232 port is enabled when the RS-232 port is set to console mode or CLI mode.*

Console mode

To enable the serial RS-232 port as console port, keep the reset button pressed while the power is connected and release the button when the power LED is on. The serial port will remain in this state until the power is disconnected.
CLI mode can be enabled in the web interface under Tools>Serial CLI

The RS-232 port is of the type DCE and can be connected to a serial port of a PC by means of a straight male-to-female cable or a USB to RS-232 serial converter. The data rate and format is 115200 bit/s, 8 bit, No parity.

Default settings

The factory default access credentials are:

- LAN IP address: **192.168.1.1**
- user name: **admin**
- password: **rsa-admin**

When in doubt on whether or not these settings are still active and when no LAN connection can be made with address 192.168.1.1, use the reset button to restore the factory default settings. (see page 8).

First time Login

The RSA series web interface allows you to set up, modify, and view configuration variables and operational data.

Note. *To access the web interface with the device in factory default settings, make sure that the PC's LAN port is operating on LAN network 192.168.1.0/24*

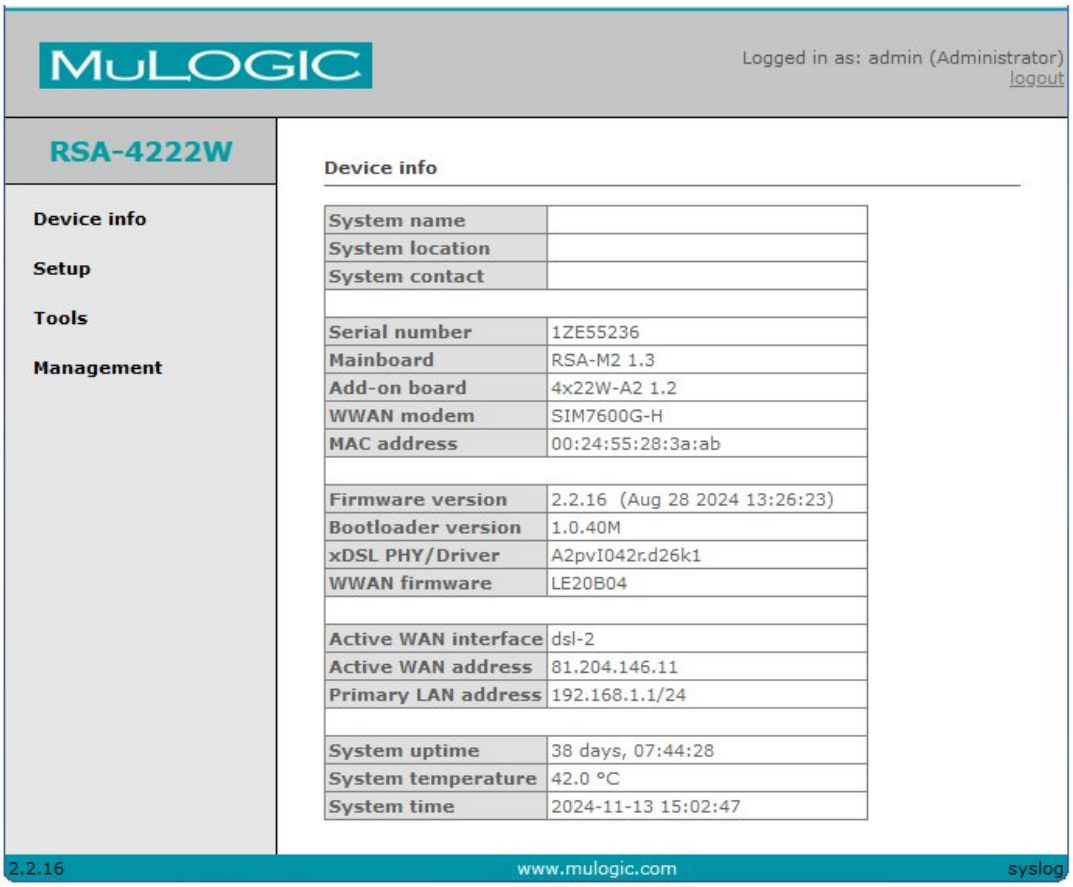
- Connect to **http://192.168.1.1**
- Log in with user name **admin** and password **rsa-admin.**
- After you have successfully logged in, you should see the Device Info Summary page.

Note 1. *Change the password **immediately** upon first configuration when the unit will be connected to the public internet.*
Refer to the RSA series configuration guide for additional information.

Note 2. *The HTTP mode is no longer considered safe to be used for access over the public internet without the use of an encrypted VPN.*

Device Info page

The Info page will show the model and general information and status of the unit. For example:



Configuration

Further details on configuration are outside the scope of this manual. Please refer to the RSA series web configuration guide for additional information.

Command line access

On factory default, SSH and Telnet[1] access is enabled for all LAN ports. You can log in with user name **admin** and password **rsa-admin**. Upon successful log-in you will get a ~# prompt.

Further details on configuration are outside the scope of this manual. Please refer to the RSA series configuration guide for additional information.

Note 1. *The Telnet mode is no longer considered safe to be used for access over the public internet, without the use of an encrypted VPN.*

4
Technical Specifications

Supported DSL Standards

- ANSI T1.413 Issue 2 (ADSL)
- ITU-T G.992.1 (G.dmt)
- ITU-T G.992.2 (G.lite)
- ITU-T G.992.3/4 (ADSL2)
- ITU-T G.992.3 Annex L (RE-ADSL)
- ITU-T G.992.3 Annex M (ADSL2 A/M)
- ITU-T G.992.3 Annex J (ADSL2 B/J)
- ITU-T G.992.5 (ADSL2+)
- ITU-T G.992.5 Annex M (ADSL2+ M)
- ITU-T G.992.5 Annex J (ADSL2 B/J)
- ITU-T G.993.2 (VDSL2, profiles 8a, 8b, 8c, 8d, 12a, 12b, 17a)[1]
- ITU-T G.993.2 (VDSL2/LR_VDSL2, profiles 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a, 35b)[2]

Note 1. RSA-M1/M2 models.
Note 2. RSA-M4 models

Wireless WAN modes (W4 versions)

- LTE FDD bands: 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 25, 26
- LTE TDD bands: 34, 38, 39, 40, 41
- UMTS (WCDMA) FDD bands: 1, 2, 4, 5, 6, 8, 19
  GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz
- UMTS/HSPA+, 3GPP release 6/7.
- GSM/GPRS/EDGE, 3GPP release 99/4.
- HSDPA/HSUPA data rates DL: 7.2/14.4 Mbit/s, UL: 2.0/5.76 Mbit/s.
  concurrent data rate: DL 7.2 Mbit/s / UL 5.76 Mbit/s.
- LTE Cat. 4 DL: max. 100 Mbps, UL: max. 50 Mbps.
- Approvals: RED, R&TTE, GCF, CE, FCC, IC, PTCRB, UL

Wireless WAN modes (WU –LTE450- versions)

- LTE FDD bands: 3, 7, 20, 31, 72.
- LTE Cat. 4 DL: max. 150 Mbps, UL: max. 50 Mbps.
- Approvals: RED, R&TTE, GCF, CE, FCC, IC, PTCRB, UL

Ethernet ports

- RSA-M1/2: 10/100BASE-T
- RSA-M4: 10/100/1000BASE-T
- Half and Full duplex
- Auto-MDI/MDIX
- IEEE 802.1Q VLAN support

SFP port

- 1.25 Gbit/s SGMII/1000BASE-X and 100BASE-FX interface.
- Supports SFP modules and SFP+ modules with SGMII fallback.
- DDM/DOM for identification and diagnostics.
- IEEE 802.1Q VLAN support.

USB Ports

- RSA-M1/M2 models: Two external USB2.0 ports
- RSA-M1/M2 models: Maximum power (total 2 USB ports): 2W (400mA)
- RSA-M4 models: Two external USB3.0 (USB3.2 Gen 1) ports.
- RSA-M4 models: Maximum power per port: 2,5W (500mA)
- RSA-M4 models: One internal USB 2.0 port (optional)
- Support of selected Serial port extenders and WWAN modems, USB flash memory. Support of other USB devices is possible on request.

Serial ports

- RS-232 DB9 Female connector (DCE pin assignment)
- RS-485/RS-422 at 4-pin screw terminal connector.
- Port rates: 300-115200 bit/s asynchronous.
- Data format: 7 or 8 data bits, None, Odd or Even parity, 1 or 2 stop bits.

I/O Contacts

- Input: dry contact sensor maximum current: 1,25-6mA[1]
- Input: contact sensor maximum allowed loop resistance: 100Ω[1]
- Output: maximum load voltage: 100V
- Output: maximum load current: 150mA
- Output: maximum On-resistance: 8Ω.
- Output: isolation Voltage: 1500 Vrms.

Note 1. Values apply to RSA-M2 and RSA-M4 models.

xDSL Line connection

- 2-wire “RJ11” type 6P2C modular jack.
- 2-pin screw terminal connector for RSA-5422 and RSA-6422 models.

Power supply

The power supply input of the unit accepts both DC and AC voltages.
The DC input is not polarised. Three Voltage Ranges (Vr1, Vr2 and Vr3) are available.

RSA-M1/M2 Vr1 versions	RSA-M1/M2 Vr2 and Vr3 versions
• 11-3 VDC (11-28 VAC) • Power consumption: 10W max. • In-rush current (12 VDC): 612mA.	• Vr2: 18-60 VDC (18-30 VAC) Vr3: 18-72 VDC (No AC) • Power consumption: 10W max. • In-rush current (24 VDC): 295mA.

RSA-M4 Vr1 versions	RSA-M4 Vr3 versions
• 11-36Vdc (22-26Vac) • Power consumption: 16W max. • In-rush current (12 VDC): 612mA.	• 18-72 Vdc (No AC) • Power consumption: 16W max. • In-rush current (24 VDC): 295mA.

Mechanical and environmental characteristics

Metal enclosures: weight and dimensions

- 143x38x98 mm[1] (HxWxD).
- Weight: 560-625 gr. (depending on model)

Note 1. Including Screw terminal plugs. Excluding DIN rail and clip (10 mm). Excluding SFP module.

Plastic enclosures: weight and dimensions

- 95x147x30mm[2] (HxWxD).
- Weight: 235-285 gr. (depending on model)

Note 2. Including Screw terminal plugs. Excluding DIN rail and clip (10 mm)

Temperature range

- Operating temperature: -40°C to +70°C[3], Humidity: 5..95%
- Storage temperature: -40°C to +80°C, Humidity: 5..95%

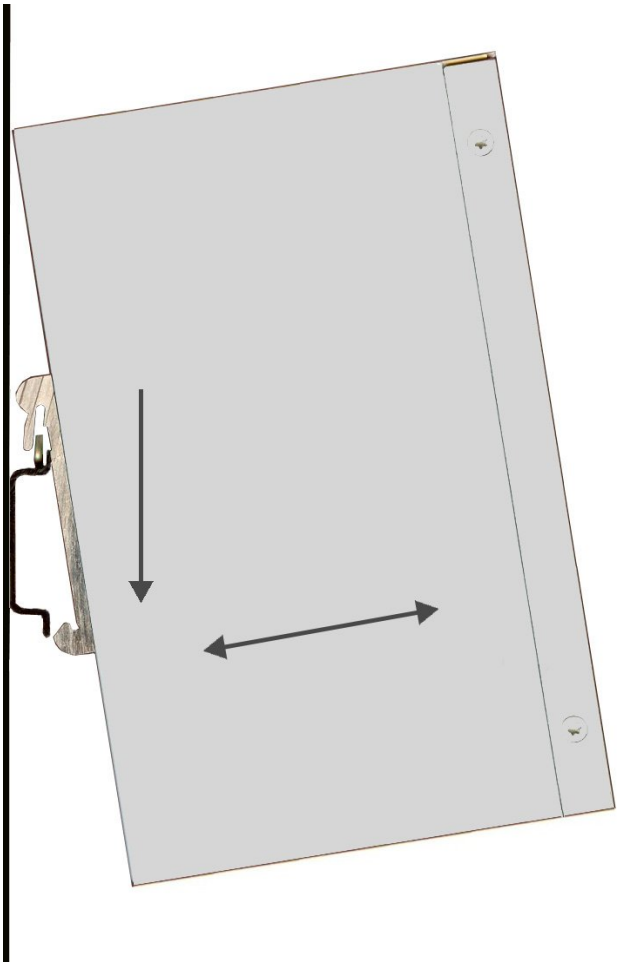
Note 3. Operating at the highest temperatures requires both top and bottom ventilation slots to have free airflow.

5 Appendix

Mounting instructions

The units of the RSA series are supplied with a mounting bracket for symmetrical rails of 35 mm according to DIN 46277-3, BS5584:1978 or EN 50-022.

To mount the unit on the DIN rail, hook the upper side of the DIN rail clamp on the DIN rail and then move the lower end of enclosure towards the DIN rail until it latches. Pressing the enclosure downwards will make the latching easier.



To remove the enclosure from the DIN rail, press the enclosure downwards while moving the lower end of the enclosure away from the DIN rail.

Note. For reliable operation over the full temperature range up to +70°C, it is important that the ventilation slots on top and bottom have free air flow.

SIM card insertion (metal enclosures, Dual SIM)

The SIM cards are inserted at the rear end of the unit. See image.

Note that the SIM1 and SIM2 cards are inserted in reversed direction.

To insert a card, press it inward until it clicks into place. Using a little tool like a screw driver may help to insert the card deeply enough.

To extract a card, press it gently further inward and then release it. The card will pop out so that it can be further extracted.

SIM card insertion (plastic enclosures and older models)

Older models and models with the plastic enclosure use a black SIM card tray. To insert the SIM card place it properly in the card tray and carefully insert the tray in the socket.

Older (single SIM) models with metal enclosure may have a SIM socket without tray like the Dual SIM models. The direction for inserting the card is indicated on the enclosure.

Cross Cables for connection to a device with RS-232 DCE port.

The RS-232 connector of the unit is of the type **DCE.**
It can connect directly to a DTE type of serial port, using a straight cable.
For connection to another DCE port, a “cross cable” is needed.

Note.
An RS-232 DCE port (modem) usually has a female DB9 or DB25 connector.
An RS-232 DTE port (PC) usually has a male DB9 or DB25 connector.

The following tables show the wiring of cross cables for DB9 and DB25.

Connector A (DB9 Male)			Connector B (DB9 Male)	
Pin	**Signal**	**Direction**	**Pin**	**Signal**
1	DCD (output)	→	4	DTR (input)
2	RxD (output)	→	3	TxD (input)
3	TxD (input)	←	2	RxD (output)
4	DTR (input)	←	1	DCD (output)
5	Signal ground	--	5	Signal ground
6	DSR (not used)		6	DSR (not used)
7	RTS (input)	←	8	CTS (output)
8	CTS (output)	→	7	RTS (input)
9	Ring (not used)		9	Ring (not used)

DB9 to DB9 DCE-DCE cross cable

Connector A (DB9 Male)			Connector B (DB25 Male)	
Pin	**Signal**	**Direction**	**Pin**	**Signal**
1	DCD (output)	→	20	DTR (input)
2	RxD (output)	→	2	TxD (input)
3	TxD (input)	←	3	RxD (output)
4	DTR (input)	←	8	DCD (output)
5	Signal ground	--	7	Signal ground
6	DSR (not used)		6	DSR (not used)
7	RTS (input)	←	5	CTS (output)
8	CTS (output)	→	4	RTS (input)
9	Ring (not used)		22	Ring (not used)

DB9 to DB25 DCE-DCE cross cable