

RSA-M4 series - Hardware guide

MuLOGIC
RSA-M4 SERIES
HARDWARE GUIDE



RSA-M4 series

Industrial Remote Access Routers

Compliances

CE Compliance

- EMC: directive 2014/30/EU (emissions: EN 55032, immunity: EN55035)
- Safety: Directive 2014/35/EU (EN 62368-1)

The RSA series of routers complies with EMC directive 2014/30/EU and is classified for use in Residential areas. Test standard: EN 55032 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 61000-6-2:2019).

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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Introduction**Supported models in this user guide**

Series	Eth ports	SFP port	ADSL2+	VDSL2	RS232 port	RS485 port	USB ports	2G WWAN	3G WWAN	4G WWAN	Dual SIM	Casing
RSA-1420M	1	-	✓	✓	✓	✓	-	-	-	-	-	Metal
RSA-1420W4	1	-	✓	✓	✓	✓	-	✓	✓	✓	✓	Metal
RSA-1420WU	1	-	✓	✓	✓	✓	-	-	-	LTE450	✓	Metal
RSA-2420M	2	-	✓	✓	✓	✓	-	-	-	-	-	Metal
RSA-2420W4	2	-	✓	✓	✓	✓	-	✓	✓	✓	✓	Metal
RSA-2420WU	2	-	✓	✓	✓	✓	-	-	-	LTE450	✓	Metal
RSA-3420M	1	✓	✓	✓	✓	✓	-	-	-	-	-	Metal
RSA-3420W4	1	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	Metal
RSA-3420WU	1	✓	✓	✓	✓	✓	-	-	-	LTE450	✓	Metal
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

Hardware Features

Depending on the model, some features described below may not be present.

- DSL port supports ADSL, ADSL2, ADSL2+ and VDSL2.
- One hardware version for ADSL Annex A and Annex B.
- Internal WWAN modem for global connectivity or for LTE, LTE450 bands.
- SFP port with 1.25 Gbit/s SGMII and SERDES interface. Supports SFP modules and SFP+ modules with fallback to SGMII.
- SFP interface supports DDM/DOM identification and diagnostics.
- Ethernet ports support 10/100/1000BASE-T and Auto-MDI/MDIX.
- IEEE 802.1Q VLAN support for VDSL2/PTM, LAN and WAN Ethernet/SFP interfaces.
- Two serial ports (one RS-232, one RS-485) for serial data rates from 1200 to 460800 bit/s.
- Two USB 3.0/USB 3.2 Gen1 ports for connecting external USB WWAN modems, memory devices, serial ports and other peripherals.
- Optional internal USB2.0 port.
- Dry contact input and dry contact output for status/alarm indication.
- RS-232 control signals can be used as GPIO or for status/alarm indication.
- USB power outputs can be utilised and controlled as independent 5 VDC 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.

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	Indicates a System Alert.
DSL	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	Indicates that a WAN IP connection is established.
WRL (Eth0)	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. Note: On the RSA-1420M, 2420M and 3420M this LED will show the link status of Eth0.
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 or unidentified SFP module.
USB 1/2	The USB 1 and USB 2 LEDs indicate that the power of the USB port is switched on ¹ .

Note 1. USB data ports remain 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:

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.

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

To access the unit with default settings, go to: <https://192.168.1.1>

Connectors

Power Connector



The power connector is a 2-pin socket for a 3.81 mm screw terminal plug. The plug is supplied with the unit.

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: 10-36 VDC, 22-26 VAC.

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

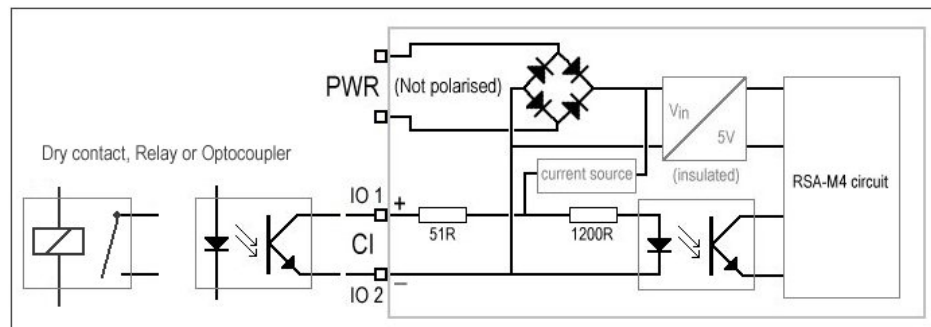


The I/O connector is a 4-pin socket for a 3.81 mm screw terminal plug. The plug is supplied with the unit.

Input

Pins 1 and 2 (marked CI) of the I/O connector are connected to a contact sensor. This input can be used for dry (potential free) contact such as a switch, a relay, or an optocoupler.

This input is also used when a UPS, power buffer module or backup battery is connected. When the mains supply fails, a contact should open or close. See page 24 for details.



Circuit of the CI contact input

Status changes of this input can be monitored using a management service or reported as a system alert.

- Maximum closed contact current: 3,3 mA.
- Maximum open-contact Voltage: 5,5V
- Maximum loop resistance (contact plus cable): 400Ω.

(See notes on the following page)

Note. Only use this input for “potential free contacts” like the contact of a switch or relay, or the transistor part -NPN type- of an opto coupler. The collector of this transistor must be connected with Pin 1, the emitter with Pin 2.

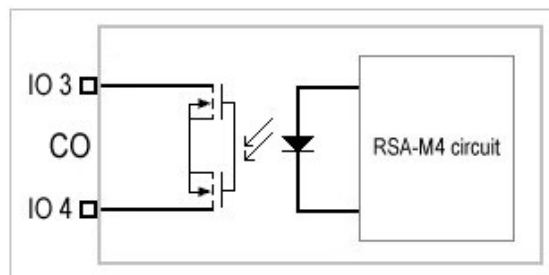
Caution: Do not connect these contacts to any power source, including the unit’s power source, nor apply any voltage to the input pins. The contact inputs are galvanically connected with the unit’s power input.

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.



Circuit of the CO contact output

RS-485 Connector



The RS-485 connector is a 4-pin socket for a 3.81 mm screw terminal connector. The plug is supplied with the unit.

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.

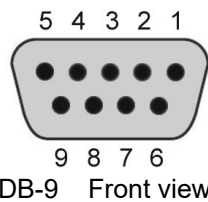
(see notes on the following page)

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: Pins 2,3 and the receive data input pins 1,4 are biased with 10kΩ. When not used (in 2-wire RS-485 mode) pins 1 and 4 can remain unconnected.

RS-232 Connector

The RS-232 connector is of the type **DCE** (as commonly used on modems). It can connect directly to a DTE-type serial port (such as that on a PC) using a straight-through cable. To connect to another DCE port, a crossover (“null modem”) cable is required. See page 22 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	RI – Ring indicator		●

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. It can also be configured as general purpose output.

The CTS output is used for flow control of the incoming (transmit) data. It can also be configured as general purpose output.

The RI output can be configured as general purpose output.

The RTS input is used for flow control of the outgoing (receive) data. It can also be configured as general purpose input.

The DTR input is used for indicating that an active DTE port is connected. It can also be configured as general purpose input.

Using RS-232 control signals as GPIO

The control signals of the RS-232 port can also be used as general purpose IO.

Note. Even when the RS-232 control signals are used as GPIO, the RxD and TxD signals can still be used for serial communication. When RTS and CTS are used for GPIO, hardware flow control of the serial interface must be disabled.

The function of these outputs can be configured on **Setup>Physical Ports>I/O** in the web interface.

Each output can be designated as either a general-purpose output or as a standard RS-232 control signal.

When RS-232 I/O is enabled, the inputs are assigned as general-purpose inputs.

Electrical characteristics

Outputs

Available pins: CTS (pin 7), DCD (pin 1), DSR (pin 6), RNG (pin 9)

Output Voltage Level: High = 5.5 VDC, Low = -5.5 VDC (typical)

Max output current (note 1): 5 mA @ high level.

Max load resistance: 1200 Ω . (note 2)

Short-circuit current: ± 35 mA typical.

Output resistance: 300 Ω (typical) (note 2)

Note 1: This is the current between the output and signal ground (pin 5). The maximum of 5 mA is based on the typical output resistance of 300 Ω and ensures that the output voltage remains within the 4–5 V range.

Note 2: The actual output resistance may be below 300 Ω , which allows for a higher output current (lower load resistance); however, no guarantee can be given for output resistance values below 300 Ω .

Inputs

Available pins: RTS (pin 8), DTR (pin 4)

Maximum input voltage: ± 25 VDC (note 3)

Input High level: > 3 VDC (typical) (note 3)

Input Low level: < 1 VDC (typical) (note 3, 4)

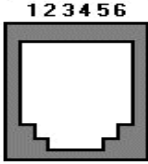
Input resistance: 5 k Ω (typical)

Note 3. All mentioned voltage levels are with respect to Signal ground (pin 5).

Note 4. For longer circuits in electrically noisy environments, a low level below -1 VDC is recommended. This can be achieved by using one of the RS-232 outputs configured to provide a low (negative) level.

See page 23 for instructions on connecting a dry (potential-free) contact to the RTS and DTR inputs.

DSL Connector

	<p>1 = Not connected 2 = Not connected 3 = DSL line wire a 4 = DSL line wire b 5 = Not connected 6 = Not connected</p>
---	---

The DSL line connector on the RSA-4422(W) is an RJ11 type modular jack. An RJ11 cable is supplied with the unit.

	<p>1 = DSL line wire a 2 = DSL line wire a</p>
---	---

The DSL line connector on the RSA-5422(W)/6422(W) is a 2-pin socket for a 3.81mm screw terminal connector. The plug is supplied with the unit.

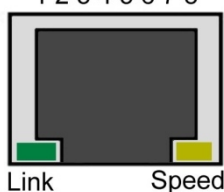
SFP Socket

The SFP port uses a standard socket as specified by the SFP Multi-Source Agreement (MSA).

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 port.
- **SFP present** (yellow): Indicates that an SFP module has been detected successfully. This LED blinks when an SFP detection error is detected or when the SFP inventory information is not available

Ethernet Ports

	<u>10/100 Base-T</u>	<u>1000 Base-T</u>
	<p>1 = Tx+ 2 = Tx- 3 = Rx+ 4 = Not connected 5 = Not connected 6 = Rx- 7 = Not connected 8 = Not connected</p>	<p>1 = BI_DA+ 2 = BI_DA- 3 = BI_DB+ 4 = BI_DC+ 5 = BI_DC- 6 = BI_DB- 7 = BI_DD+ 8 = BI_DD-</p>

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 operating at 10, 100 or 1000 Mbit/s, depending on the Ethernet LED configuration. By default, this LED is on for both 100 and 1000 Mbit/s links.

USB Connectors

The USB3.0 ports 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. Note that the USB ports will remain activated regardless of the status of the USB power.

USB power

USB output power can be turned on or off in the settings. Note that the USB data port will remain active regardless of the state of the USB power. The USB voltage may vary between 4.95 V and 5.25 V depending on the load.

The maximum allowed continuous current per USB port is 500 mA. For currents above 650 mA, the voltage will be reduced. For currents above 750 mA, the power output will be disabled and will remain disabled until the load is removed. When disabled, the USB LED will be off. The overcurrent state of each USB port can be reported through the Alert Messages.

Antenna Connector

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

The used antenna and coaxial cable must have a characteristic impedance of 50Ω and must be matched for 450/460 MHz, 900/1800/2100 MHz or 850/1900 MHz, depending on the frequency bands used by the cellular network operator.

SIM Card slots (W-versions only)

The two SIM card slots are located at the rear side of the enclosure. See page 21 for instructions on inserting the SIM cards.

Installation

Power connection

Connect the power cable to the PWR screw terminal socket. The device can be powered from low voltage DC or AC sources. The voltage range indication (Vr1 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 used if, in addition to 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 service.

- 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 should start blinking within 1 minute after power-on, or within a few seconds when the unit was already powered on and ready.

When the DSL connection is established, the DSL LED is On continuously.

Once the DSL connection is established, the DSL LED remains continuously on. The actual Internet connection will not be established until the unit is configured with the correct parameters, such as VPI/VCI and ATM or PTM encapsulation protocol and VLAN ID, which are provided by your ISP.

Ethernet cable(s)

The Ethernet ports support 10/100/1000BASE-T, HD or FD, 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 connected Ethernet device, the green (link) LED at the Ethernet connector unit will be on. When data passes over the Ethernet cable, this LED will briefly blink.

When connected in 100BASE-T or 1000BASE-T mode, the yellow (speed) LED will be on. The LED function 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 or cannot be identified.

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 page 22.

See page 23 for instructions on connecting a dry (potential-free) contact to the RTS and DTR inputs.

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 1.1, USB 2.0 or USB3.0 (USB 3.2 Gen 1).

Warning: *Disconnecting a USB device while the unit is powered on may result in an undefined state for both the 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 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*

3

Technical Specifications

Supported DSL Standards

- ANSI T1.413 Version 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, 30a, 35b)
- ITU-T G.993.2 Annex D (Long Reach VDSL2, profiles 8a and 17a)

Wireless WAN with global 2G, 3G and 4G support (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. 150 Mbps, UL: max. 50 Mbps.
- Approvals: RED, R&TTE, GCF, CE, FCC, IC, PTCRB, UL

Wireless WAN with 4G and LTE 450 support (WU 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

- 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

- Two external USB3.0 (USB3.2 Gen 1) ports.
- Maximum power per port: 2,5W (500mA @ 5 V)
- One internal USB 2.0 port (optional)
- Support of selected Serial port extenders, WWAN modems and 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.
- Data rates: 1200-460800 bit/s asynchronous.
- Data format: 7 or 8 data bits, None, Odd or Even parity, 1 or 2 stop bits.
- Typical Output voltage: ± 5.5 VDC
- Maximum input voltage: ± 25 VDC
- Input High level: > 3 VDC (typical)
- Input Low level: < 1 VDC (typical)
- Input resistance: 5 k Ω (typical)

I/O Contacts

- Input: dry contact sensor, maximum current: 3 mA
- Input: dry contact sensor, open circuit Voltage: 5,2 V.
- Input: contact sensor maximum allowed loop resistance: 100 Ω
- Output: maximum load voltage: 100V
- Output: maximum load current: 150mA
- Output: maximum On-resistance: 8 Ω .
- Output: isolation Voltage: 1500 Vrms.

xDSL Line connection

- 2-wire "RJ11" type 6P2C modular jack.
- 2-pin screw terminal connector for RSA-5422 and RSA-6422 models.
- Electrical isolation: 1875V AC, tested at 1 mA for 2 seconds.
- Peak impulse voltage withstand (< 10 ms): 850 V.
- Continuous AC RMS voltage: 425 V.

Power supply

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

Vr1 voltage range versions	Vr3 voltage range versions
<ul style="list-style-type: none"> • 11-36Vdc (22-26Vac) • Power consumption: 16W max. 	<ul style="list-style-type: none"> • 18-72 Vdc (No AC) • Power consumption: 16W max.

Mechanical and environmental characteristics

Metal enclosures: weight and dimensions

- 143x38x98 mm¹ (HxWxD).
- Weight: 560-625 gr. (depending on model)

Note 1. Including RS-232 DB9 and WWAN SMA connector.
Excluding connectors and SFP module.
Excluding DIN rail and clip (adds 11 mm depth).

Temperature range

- Operating temperature: -40°C to +70°C², Humidity: 5..95%
- Storage temperature: -40°C to +80°C, Humidity: 5..95%

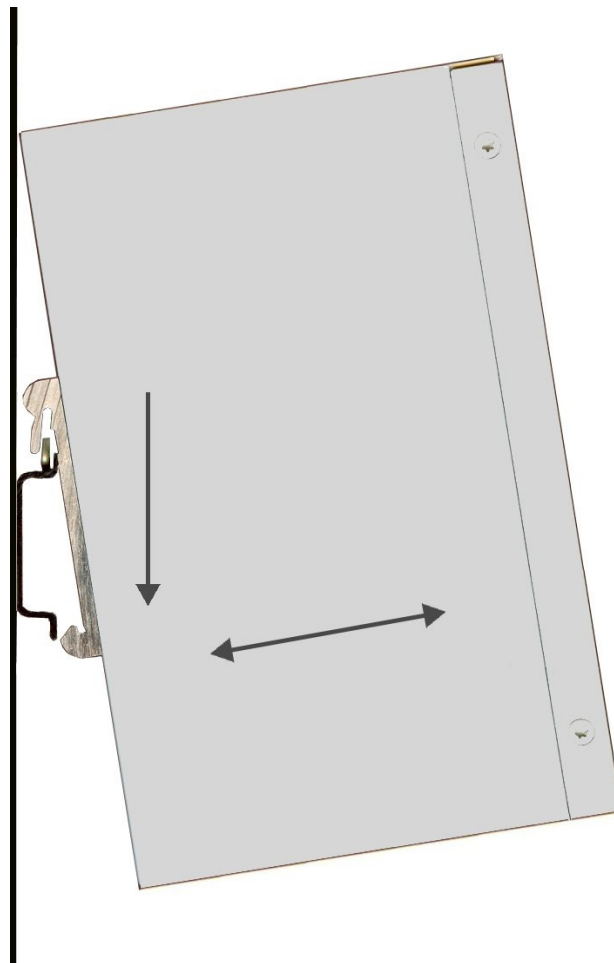
Note 2. Operating at the highest temperatures requires free airflow through both the top and bottom ventilation slots.

4 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

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



Note that the **SIM1** and **SIM2** cards are inserted in reverse orientation.

To insert a card, press it inward until it clicks into place.
Using a small tool, such as a screwdriver, may help ensure the card is fully seated.

To remove a card, press it gently further inward and then release it.
The card will pop out and can then be fully removed.

Cross Cables for connection to devices with an RS-232 DCE port.

The unit features a DCE-type RS-232 connector. It connects directly to a DTE serial port using a straight cable. To connect the unit to another DCE port, use a **'cross cable'** (null modem).

Note.

An RS-232 **DCE** port (modem) typically has a female DB9 or DB25 connector.
An RS-232 **DTE** port (PC) typically 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

Connecting dry contacts to the RS-232 RTS and DTR inputs

For connecting dry (relay) contacts or optocouplers, it is recommended to pull up the inputs to the High level using a 1 kΩ pull-up resistor connected to one of the RS-232 outputs.

By convention, an **open contact** corresponds to a **High** logic level. The **closed** state corresponds to either **0 V** or a (negative) **Low** level (–5.5 V) from another RS-232 output.

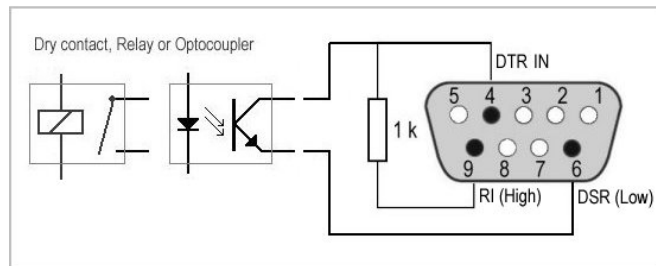
Note that an input voltage of 1.5 V may already be interpreted as a **High** level. Therefore, using 0 V for the **Low** level in electrically noisy environments or with long cables between the contact and the unit may leave very little noise margin. Under these conditions, use a negative voltage for the **Low** state.

Examples

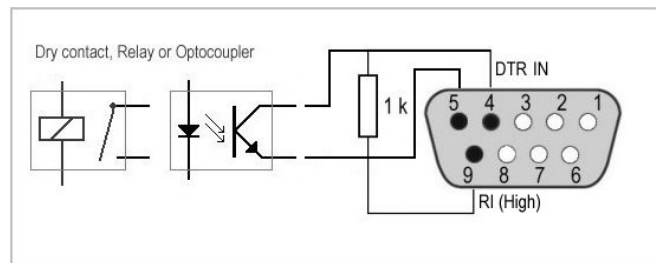
The following circuits illustrate how to connect a dry (potential-free) contact.

Note: When using a standard NPN-type optocoupler, the **Collector** must be connected to the higher potential and the **Emitter** to the lower potential to ensure correct current flow.

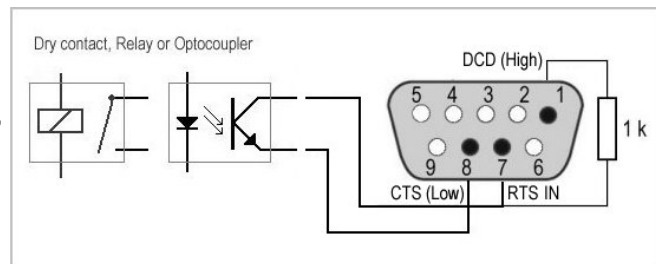
Using DTR as input, RI for high level, and DSR for low level.



Using DTR as input, RI for high level, and signal ground for low level.



Using RTS as input, DCD for high level, and, CTS for low level.



Using RTS as input, DCD for high level, and signal ground for low level.

