

RAR 24XX

Remote Access Router

Operating Manual

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Remote Access Router

RAR 24XX



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1 Introduction

The RAR 24XX is the standard and most supported hardware for SIGMATEK’s Remote Access Platform (RAP). The RAR 24XX makes it convenient to remotely connect to your equipment, while the built-in firewall keeps your equipment safe from outside threats. Configuration is as easy as inserting a USB flash drive, which contains your configuration file, into the RAR 24XX’s USB port. The configuration file can be generated from the [Tools] page on the RAP.

1.1 Contents of Delivery

- RAR 24XX Remote Access Router
- 4 GB USB flash drive used for configuration
- Female 4-pin plug-in connector with screw connection
(model Weidmueller BL 5.08/04/180 SN BK BX or equivalent)

This document can be downloaded from our website www.sigmathek-automation.com. Additional documents may be included with delivery.

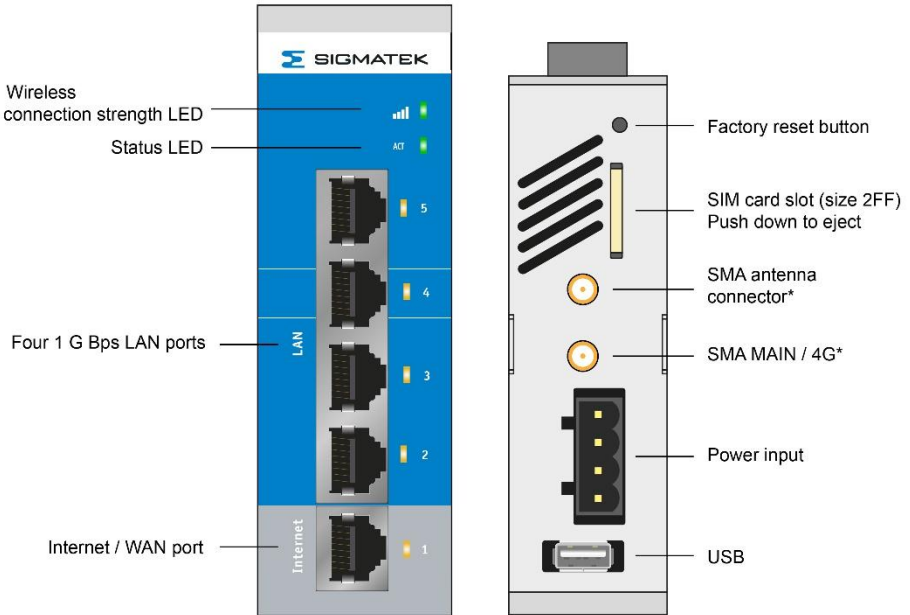
2 Product Overview

2.1 Product Family

Type	Ethernet (Global)	4G-G (Global)	Wi-Fi (Global)
RAR 2400	✓		
RAR 2405	✓	✓	
RAR 2410	✓		✓
RAR 2415	✓	✓	✓

2.2 Hardware Overview

The RAR 24XX is created with performance and a multitude of hardware capabilities in mind.



4G SMA Connectors

RAR 24XX 4G variants have 2 SMA antenna connectors. The one closest to the power connector is the MAIN. The other connector is the DIV. Always connect an antenna to the MAIN. Connecting an antenna to the DIV is optional.

4G & Wi-Fi SMA Connectors

The 4G & Wi-Fi variant has 2 SMA antenna connectors. The one closest to the power connector is for 4G. The other connector is for Wi-Fi.

3 Technical Data

The specifications below are applicable for all RAR 24XX variants. The 3G, 4G, and Wi-Fi variants each have additional specifications, listed separately.

Power supply (recommended)	12-24 VDC $\pm$ 20 % LPS 2 A
Power consumption	10 W max, about 2.5-5 W* idle
Operating temperature	-20 ... +65 °C
Relative humidity	10-95 % non-condensing
Operating altitude	up to maximum 2000 m
Storage temperature	-20 ... +65 °C
Storage humidity	10-95 % non-condensing
Storage altitude	up to maximum 3000 m
Ethernet ports	five 1 Gbps (4x LAN, 1x WAN)
USB	USB 2.0
Processor	MIPS 800 MHz
Digital Input	yes
Degree of protection	IP20
Mounting	DIN rail
Size	95 x 116 x 28 mm (excl. DIN rail clip)
Weight	270-310 g
Certifications	CE, UL (E540530), FCC Verification, RoHS, REACH
3G additional specifications:	UMTS/HSPA+ - 800, 850, 900, 1900,2100 MHz
Protocols and frequencies	GSM/GPRS/EDGE - 850, 900, 1800, 1900 MHz
Class	5 bands GPRS/EDGE Class 12
Speed	HSPA+ - Max.14.4 Mbps (DL)/Max.5.76 Mbps (UL) UMTS - Max.384 Kbps (DL)/Max.384 Kbps (UL) EDGE - Max.236.8 Kbps (DL)/Max.236.8 Kbps (UL) GPRS - Max.85.6 Kbps (DL)/Max.85.6 Kbps (UL) CSD - 14.4 Kbps
SIM size	Standard SIM card (size 2FF)

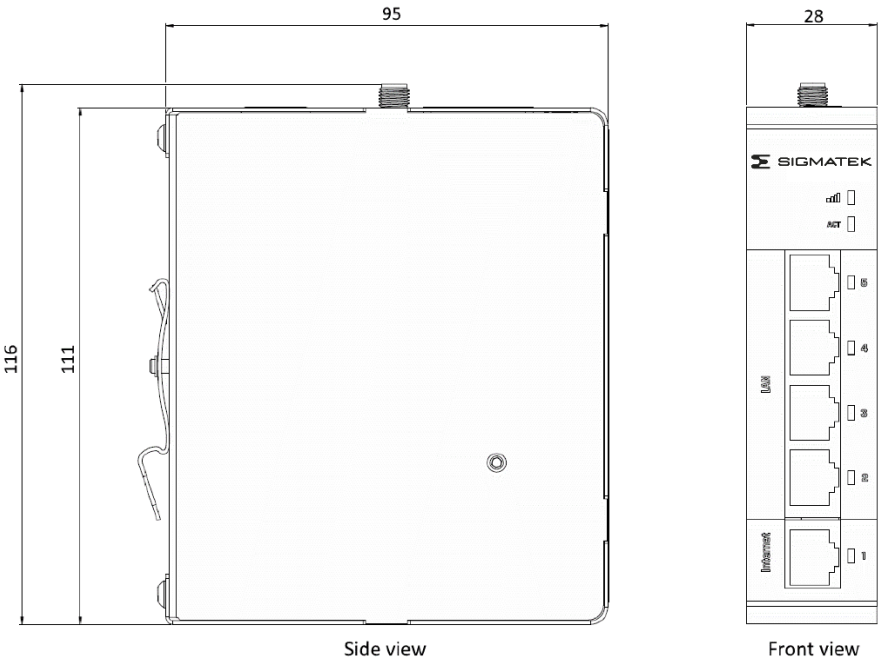
FCC ID	XMR201903EG25G
LTE additional specifications:	FDD-LTE - B1, B3, B5, B7, B8, B20
4G-G protocols and frequencies	WCDMA - B1, B5, B8
(Global)	GSM/GPRS/EDGE - 850, 900, 1800, 1900 MHz
Speed	LTE-FDD - Max.100 Mbps (DL)/Max.50 Mbps (UL) LTE-TDD - Max.61 Mbps (DL)/Max.18 Mbps (UL) DC-HSPA+ - Max.42 Mbps (DL)/Max.5.76 Mbps (UL) TD-SCDMA - Max.4.2 Mbps (DL)/Max.2.2 Mbps (UL) WCDMA - Max.384 Kbps (DL)/Max.384 Kbps (UL) EDGE - Max.236.8 Kbps (DL)/Max.236.8 Kbps (UL) GPRS - Max.85.6 Kbps (DL)/Max.85.6 Kbps (UL) CSD - 14.4 Kbps
SIM size	Standard SIM card (size 2FF)
Wi-Fi additional specifications:	
Wi-Fi IEEE 802.11 version	b/g/n
Wi-Fi modes	Station (Client) Mode and Access Point
Speed	72 Mbps
FCC ID	XPYLILYW1

3.1 Article Numbers

Type	Included Module	Article Numbers
RAR 2400	-	01-692-2400
RAR 2405	4G (Global)	01-692-2405
RAR 2410	Wi-Fi	01-692-2410
RAR 2415	4G (Global) & Wi-Fi	01-692-2415

3.2 Dimensions

The RAR 24XX is designed to be easily installed on a standard DIN rail. The small size of the RAR 24XX allows you to make efficient use of space. (Unit of measurement: millimeter.)



4 Installation



Install in an enclosure

These devices are open-type and are meant to be installed in an enclosure which is only accessible with the use of a tool and suitable for the environment.

When designing the layout of your system, always separate the devices that generate high voltage and high electrical noise from the low-voltage, logic-type devices such as the RAR 24XX.

Also, take the heat-generating devices into consideration and place the electronic devices in the cooler areas of your cabinet. Reducing the exposure to a high-temperature environment will extend the operating life of the RAR 24XX.

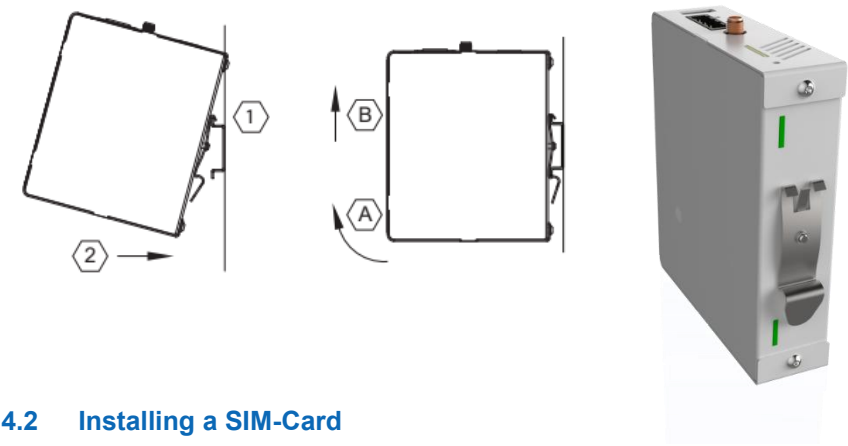
Consider also the routing of the wiring for the devices in the panel. Avoid placing low-voltage signal wires and communications cables in the same tray with AC power wiring and high-energy, rapidly-switched DC wiring.

The RAR 24XX is designed to be cooled using natural convection. For proper cooling, you must provide a clearance of at least 25 mm above and below the device. Also, allow at least 25 mm of depth between the front of the device and the inside of the enclosure.

Because SIGMATEK's RAR 24XX is essentially a small computer, the RAR 24XX can be used for many different purposes. You can, for example, access, program and control industrial machines around the globe. Do not use the RAR 24XX unless you've received proper training or have proper knowledge about the RAR 24XX and its capabilities. It is expected that the user is knowledgeable about networking settings and is aware of the potential consequences on i.e. security.

4.1 Installing and Removing from DIN Rail

The RAR 24XX can be easily installed on a standard DIN rail. (1) Hang the device on the rail and (2) push the unit down until you feel a click. To remove the unit, (A) pull/rotate the device up and (B) lift it off the rail.



4.2 Installing a SIM-Card

The SIM card slot suits a standard SIM card (size 2FF).

To insert, push the SIM card approximately 1 mm into the slot until you feel a click. Release the card and the card will stay in the device. The end of the SIM card should be aligned with the outside of the enclosure.

To remove, push the SIM card firmly into the slot until you hear a click. Releasing will cause the SIM card to partially eject, allowing you to easily take out the card.

4.3 Power Supply

The RAR 24XX must be powered by an IEC/UL/EN/60950-1 certified Limited Power Supply (LPS) or for the United States a Class 2 power supply. The LPS power supply is not included in this package.

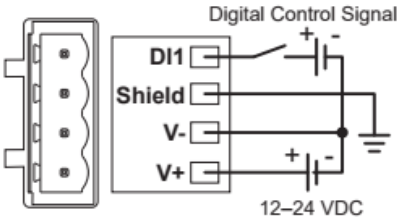
Power supply	12-24 VDC ±20 % LPS 2 A
Internal voltage protection	29 V max
Input protection	protected against polarity inversion
Isolation	1.5 kV

4.4 **Wiring**

Proper grounding and wiring of all electrical equipment are important to help ensure the optimum operation of the RAR 24XX and to provide additional electrical noise protection for your application.

The RAR 24XX comes with a female 4-pin plug-in connector with screw connection (type: Weidmueller BL 5.08/04/180 SN BK BX). The optimal wire profile is 1.5 mm² (16-12 AWG).

Pin	Function
Wire size range	18-12 AWG
Wire strip length	7 mm
Terminal screw torque	0.4 Nm
Max. wire length	3 m
Min. ground conductor	16 AWG



4.5 **Digital Input**

By default, the Digital Input is not configured and doesn't need to be wired. The digital input provides a way to locally manage the RAR 24XX's VPN connection (ON/OFF). The wiring is depicted in the image above.

Type	Optocoupler
Voltage range	0-29 VDC
Voltage range (OFF state)	0-3 VDC
Voltage range (ON state)	7-29 VDC
Current voltage (ON state)	2-5 mA (typically)

4.6 **Shield**

Connect the Shield pin of the RAR 24XX with the protective earth conductor (PE), min. core profile Cu 1.5 mm².

5 Operation

5.1 Configure the RAR 24XX

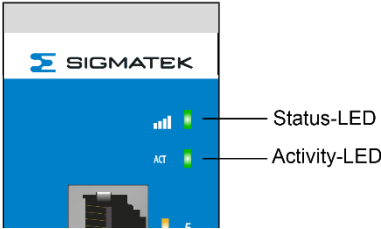
To configure your RAR 24XX, log in to your RAP-account and navigate to the [Tools] page. Here you can generate an RAR 24XX configuration file by following a few simple steps. You can then download the configuration file, which must be copied onto a USB flash drive. After supplying power to the RAR 24XX, insert this USB flash drive in the USB port. The RAR 24XX will register itself to SIGMATEK's RAP and set up a secure VPN connection. You can further configure the RAR 24XX via the RAP (www.sigmatek-connect.com).

5.2 LED Status Indicators

The RAR 24XX has two LEDs for router status:

- Signal-LED (3G, 4G, Wi-Fi signal)
- Activity-LED

To boot up and set up a secure connection the RAR 24XX requires approximately **2 minutes**.



5.2.1 Signal-LED

Blinking blue	Initializing cellular module
Blinking red 1 pulse	No reception or unable to connect to network (APN or SSID may be incorrect)
Blinking red 2 pulses	PIN invalid or PUK required (a phone is required to unlock SIM card with PUK)
Blinking red 4 pulses	SIM card is invalid or missing
Constant red	Connected, poor reception
Constant purple	Connected, medium reception
Constant blue	Connected, good reception

5.2.2 Activity-LED

Constant red	Booting up (<i>may take 1-2 min</i>) or not yet registered
Blinking red 1 pulse	Waiting for internet access
Blinking red 3 pulses	LAN/WAN conflict (conflicting subnets)
Blinking red 4 pulses	Removed from the platform (re-insert USB flash drive to register again)
Blinking red 5 pulses	Previously registered to the RAP (remove from the RAP and register again)
Blinking blue 1 pulse	Connecting to the RAP
Blinking blue 2 pulse	Setting up a VPN connection
Constant blue	Active VPN connection to the RAP

5.3 Reset to Factory Default



This action cannot be undone! All settings will be reset to factory default.

The RAR 24XX can be reset to the factory default settings by pressing and holding the reset button on top for 5 seconds. The ACT LED will blink while the reset button is pressed. Upon release of the button, the ACT LED will rapidly blink if the button was pressed long enough to trigger a reset. Wait for the RAR 24XX to restart. You can then configure the RAR 24XX again.



If the RAR 24XX was previously registered on the RAP you'll have to remove it from the RAP before you can register it again.

6 Connectivity Requirements (for local IT)

The RAR 24XX uses an outgoing port to establish a secure connection to our RAP. This means there is no need to open any incoming ports in your firewall.

6.1 Overview

Below is an overview of the outgoing ports and protocols that the RAR 24XX utilizes.

Port	Transport	Application
443, 8443(1)	TCP	HTTPS, MQTT (TLS), OpenVPN
53(2)	TCP & UDP	DNS

(1) Port 8443 is only used when stealth mode is active for connectivity via a censored internet connection (i.e. when located in China).

(2) DNS requests are often handled by local DNS servers. In such cases, the listed DNS port can be ignored.

6.2 Servers and DNS Requests

Via these outgoing ports, the RAR 24XX connects to different SIGMATEK servers: REST API, MQTT, and OpenVPN servers. The IP addresses of these servers, as well as the number of servers, may change over time and are thus not pre-defined. What is pre-defined is the domain of these servers. The RAR 24XX attempts to resolve these addresses by doing DNS requests. If it can't perform DNS requests, it can't connect to our servers.

6.3 MAC or IP Address Filter

The local IT department may choose to only grant specific devices internet access, based on the MAC address or IP address of the device. The MAC address can be obtained from the label on the side of the RAR 24XX. The IP address can be set to a static IP address. However, by default, the IP address is set to be assigned dynamically via DHCP.

7 Accessories

7.1 RAR 2201 – Rotatable LTE Antenna



Article number	RAR 2201
Features	700 MHz to 3800 MHz LTE/GSM/CDMA/HSPA/UMTS rotatable hinge design for optimal reception top quality housing with brass hinge and connector extended operating temperature range RoHS Compliant 7 cm long SMA Male
Compatibility	RAR 2405, RAR 2415

7.1.1 Electrical Requirements

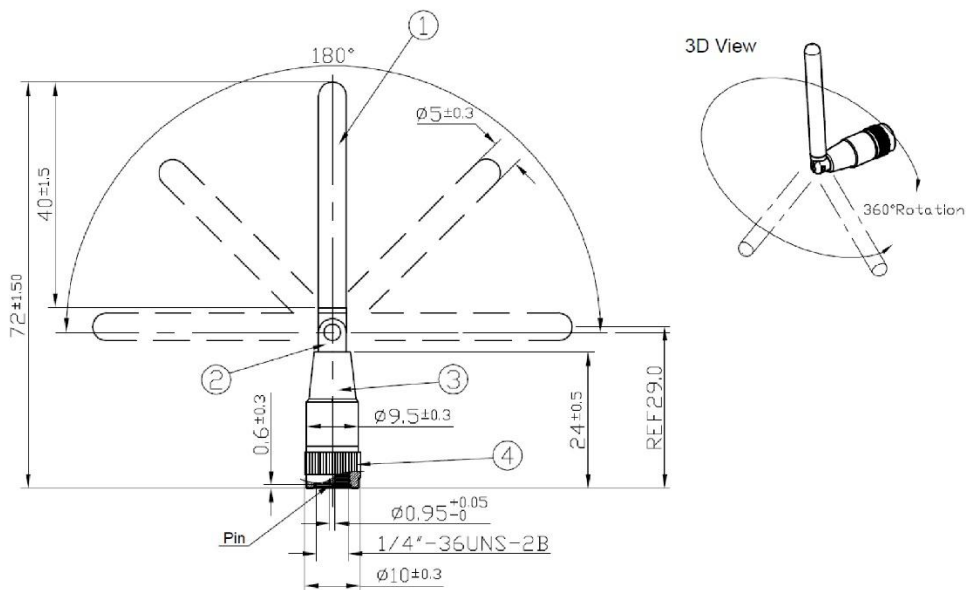
Communication System	700 LTE	AMPS	GSM	DCS	PCS	UMTS	2300 LTE	2700 LTE	3500 LTE	3700 LTE
Frequency [Mhz]	703-803	824-896	880-960	1710-1880	1850-1990	1710-2170	2300-2400	2490-2690	3400-3600	3600-3800
Efficiency*	18 %	22 %	22 %	25 %	30 %	30 %	17 %	32 %	28 %	43 %
Peak gain*	-3.0	-2.6	-3.0	0.9	0.9	0.9	-1.3	1.1	1.8	3.1
Impedance	50 Ω									
Polarization	linear									
Radiation pattern	omni-directional									
Input power	10 W									

(*) in free space

7.1.2 Environmental Conditions

Temperature range	-40 ... +85 °C
Storage temperature	-40 ... +105 °C
Casing	non-condensing 65 °C, 95 % RH

7.1.3 Mechanical Dimensions



Position	Function	Material
1	Casing	POM black
2	Hinge	Brass Ni Plated
3	Cap	POM black
4	Connector	SMA Male (Brass)

7.2 RAR 2202 – LTE Antenna, Magnetic Mount



Article number	RAR 2202
Features	2 m cable Pentaband antenna 800 MHz to 2200 MHz GSM/CDMA/HSPA/UMTS Magnetic mount Superior Super Magnet – Neodymium N35 extended operation temperature range RoHS Compliant 12 cm long SMA Male
Compatibility	RAR 2405, RAR 2415

7.2.1 Electrical Requirements

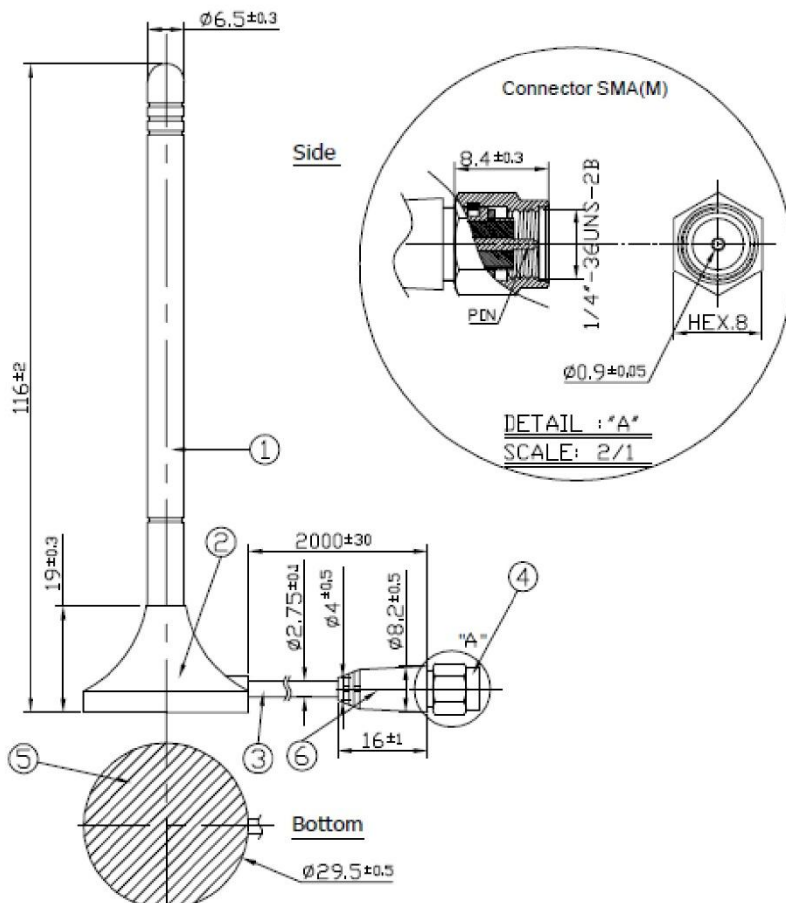
Communication System	AMPS	GSM	DCS	PCS	UMTS
Frequency [Mhz]	824–896	880-960	1710-1880	1850-1990	1710–2170
Efficiency*	35 %	45 %	2 %	22 %	22 %
Peak gain*	2.6	5.0	-2.2	-1.0	-0.7
Impedance	50 Ω				
Polarization	linear				
Radiation pattern	omni-directional				
Input power	10 W				

(*) in free space

7.2.2 Environmental Conditions

Temperature range	-40 ... +85 °C
Casing	non-condensing 65 °C, 95 % RH

7.2.3 Mechanical Dimensions



Position	Function	Material
1	antenna housing	TPU plated
2	holder	ABS black
3	RG174	PVC black
4	SMA (M)	brass gold
5	sticker	polyester white
6	strain relief bushing	PE black

7.3 RAR 2203 – Pentaband Antenna, Screw Mount



Article number	RAR 2203
Features	3 m low loss cable NFC-200 SMA(M) low profile, height just 19.5 mm and diameter 55 mm Heavy duty screw mount UV and vandal resistant PC housing and thread IP67 compliant Pentaband antenna 800 MHz to 2200 MHz GSM/CDMA/HSPA/UMTS extended operating temperature range RoHS compliant
Compatibility	RAR 2405, RAR 2415

7.3.1 Electrical Requirements

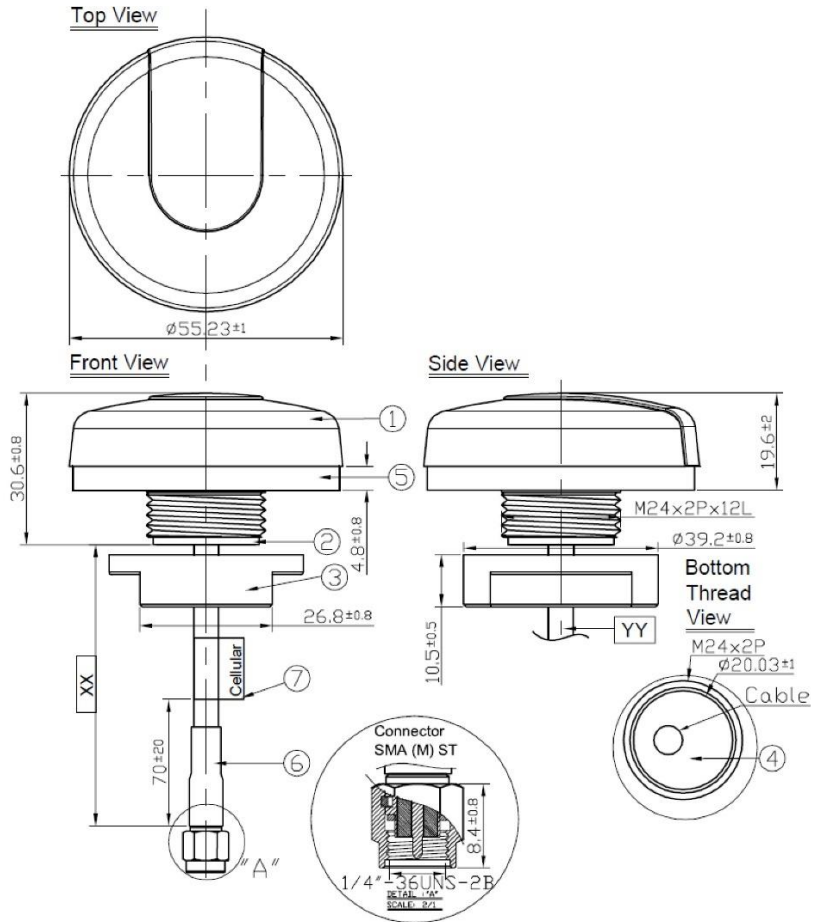
Communica- tion System	AMPS	GSM	DCS	PCS	UMTS
Frequency [Mhz]	824–896	880-960	1710-1880	1850-1990	1710–2170
Efficiency*	39.1 %	39.3 %	53.4 %	52.5 %	53.4 %
Peak gain*	2.0	1.8	3.9	3.9	3.9
Impedance	50 Ω				
Polarization	linear				
Radiation pattern	omnidirectional				
Input power	10 W				

(*) in free space

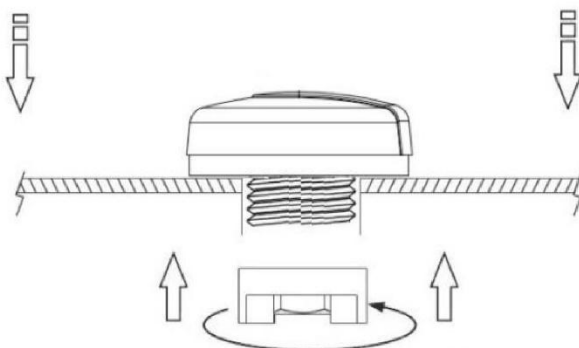
7.3.2 Environmental Conditions

Temperature range	-40 ... +85 °C
Casing	non-condensing 65 °C, 95 % RH

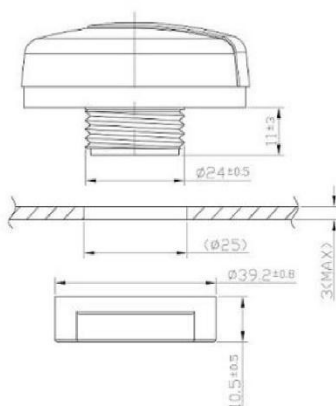
7.3.3 Mechanical Dimensions



Position	Function	Material
1	Housing top	PC black
2	Housing bottom	PC black
3	M24 Nut	ABS black
4	Silicon rubber	Silicon rubber black
5	Foam	CR4305 + 3M9445 black
6	Heat shrink tube	PE black
7	Label	PET white
-	Cable 3 m NFC-200	black
-	Connector SMA (M)	gold



Recommended torque for Mounting is 3.92N·m
Maximum torque for Mounting is 4.9N·m



7.4 RAR 2204 – Wall Mount Power Supply for RAR Router



Article number	RAR 2204
Features	Regulated 24V DC Output Max. current 1 A Max. Power 24 W Safety Agency Requirements and EMI/EMS Certified RoHS compliant 180 cm long cable 4-pin terminal block output connector

7.4.1 Specifications

Output Voltage	24 V DC
Output Current	1 A DC
Max. Output Power	24 W
Output ripple / Noise	240 mVp-p
Cable	180 cm
Input Connector	Europe type 2-pin
Output Connector	4 Position Terminal Block Plug

7.4.2 Input

Voltage	(90~264) V AC
Frequency	(47 ~ 63) Hz
Current	1 A rms@AC low line input and DC output full load
Inrush Surge Current (cold start)	60 A max@power supply cold start, ambient temperature 25 °C @100 V AC/240 V AC nominal AC input
Leakage current	< 0,25 mA bei 240 V AC input

7.4.3 Output

Turn delay	3000 ms max on the condition that input voltage 230 V, full load
Hold up time	5 ms min@AC nominal input@output full load
Efficiency	> 81.39 % min. Eff= 0.071 x ln(Po/1W) - 0.0014 x Po/1W + 0.67 Directive EU 2019/1782
Power consumption	0.1 W max. At AC nominal input@output min load

7.4.4 Protection

Over current/ Short protection	The power supply will self-protect any output to ground, And auto recovery when abnormal circuit faults are removed. An output short circuit is defined as any output impedance of less than 0.1 ohms.
Over Voltage	The power supply will not be auto recovered when faults remove 110 %-150 %. (Voltage limit)
Input protection	2A /250V Fuse. The power supply shall be protected against power line surges and any abnormal condition
No Load protection	The power supply is provided with no load operation to prevent the power supply and system from damage.
Protection class	II

7.4.5 Miscellaneous

Conformity	CE
Cooling method	Natural Convection Cooling
Housing material	PC, RoHS
Temperature	Operating: 0~40 °C / Storage: -20 %~85 %RH non condensing
Humidity	Operating: 8 %~90 %RH / Storage: 5 %~95 % RH non condensing
Weight	120 g

7.5 RAR 2205 – Broadband LTE Antenna

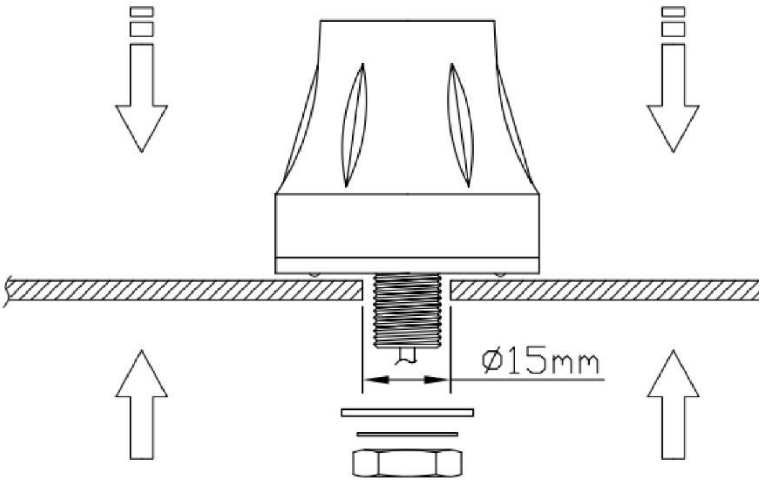


Article number	RAR 2205
Features	3 m low loss cable CFD200 cable SMA(M) low profile, height just 48 mm and diameter 50 mm heavy duty screw mount UV and vandal resistant ABS housing and thread IP67 compliant 698 to 960 MHz, 2.4 GHz and 1710 to 2700 MHz LTE/GSM/CDMA/DCS/PCS/WCDMA/UMTS/HSDPA/ GPRS/EDGE/IMT/WIFI extended operating temperature range RoHS Compliant
Compatibility	RAR 2405, RAR 2415

7.5.1 Electrical Requirements

Communication System		4G / 3G / 2G / 2.4 GHz			
Frequency [Mhz]	700-960	1710-2170	2500-2800	2400-2483	
Efficiency*	40 %	55 %	40 %	38 %	
Peak gain*	1.2	3.2	2.5	1.5	
Impedance	50 Ω				
Polarization	linear				
Radiation pattern	omnidirectional				
Input power	5 W				

(*) in free space



7.6 RAR 2206 – Broadband LTE Antenna, Magnetic Mount



Article number	RAR 2206
Features	3 m low loss cable RG-174 cable SMA(M) robust High Strength Super Magnet Mount 698 to 960 Mhz, 1575.42 Mhz, 1710 to 2700 Mhz, 3500 Mhz LTE/GSM/CDMA/DCS/PCS/WCDMA/UMTS/HSDPA/ GPRS/EDGE/GPS/WIFI extended operating temperature range RoHS Compliant
Compatibility	RAR 2405, RAR 2415

7.6.1 Electrical Requirements

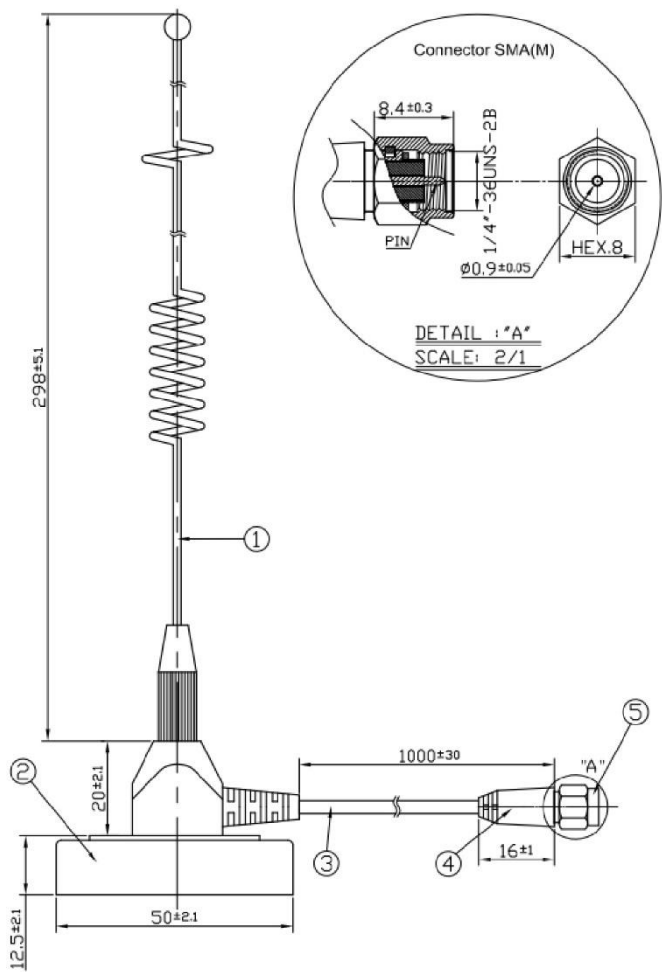
Communication System	LTE	GSM	GPS	DCS	PCS	UMTS	LTE	LTE
Frequency [Mhz]	698-800	824-960	1575.42	1710-1880	1850-1990	1710-2170	2400-2700	3500
Efficiency*	33 %	57 %	46 %	55 %	41 %	47 %	37 %	19 %
Peak gain*	-2.5	-0.1	-1.3	1.2	0.1	1.2	-0.5	-1.6
Impedance	50 Ω							
Polarization	linear							
Radiation pattern	omnidirectional							
Input power	50 W							

(*) in free space

7.6.2 Environmental Conditions

Temperature range	-40 ... +85 °C
Storage temperature	-40 ... +85 °C
Casing	non-condensing 65 °C, 95 % RH

7.6.3 Mechanical Dimensions



Position	Function	Material
1	Antenna stick	PC black
2	Cover	PC black
3	RG174	ABS black
4	Strain relief bushing	PE black
5	SMA(M)	Gold

7.7 RAR 2211 – WIFI-Antenna, Screw Mount



Article number	RAR 2211
Features	3 m low loss cable RG-316 cable RP-SMA(M) low profile, height just 48 mm and diameter 50 mm heavy duty screw mount UV and vandal resistant ABS housing and thread IP67 compliant 698 bis 960 MHz, 2.4 GHz and 1710 bis 2700 MHz LTE/GSM/CDMA/DCS/PCS/WCDMA/UMTS/HSDPA/GPRS/EDGE/IMT/WIFI extended operating temperature range RoHS compliant
Compatibility	RAR 2410; RAR 2415

7.7.1 Electrical Requirements

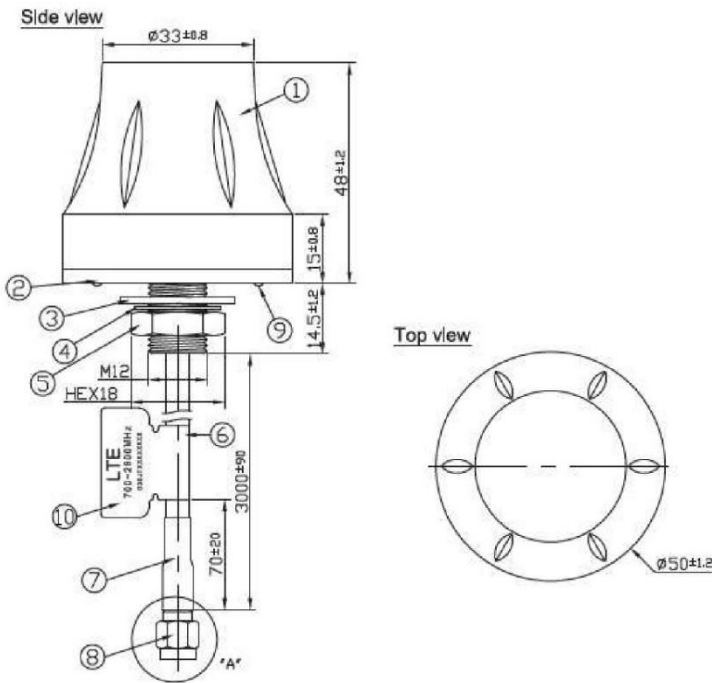
Communication System		4G / 3G / 2G / 2.4 GHz			
Frequency [Mhz]	700-960	1710-2170	2500-2800	2400-2483	
Efficiency*	40 %	55 %	40 %	38 %	
Peak gain*	1.2	3.2	2.5	1.5	
Impedance	50 Ω				
Polarization	linear				
Radiation pattern	omnidirectional				
Input power	5 W				

(*) in free space

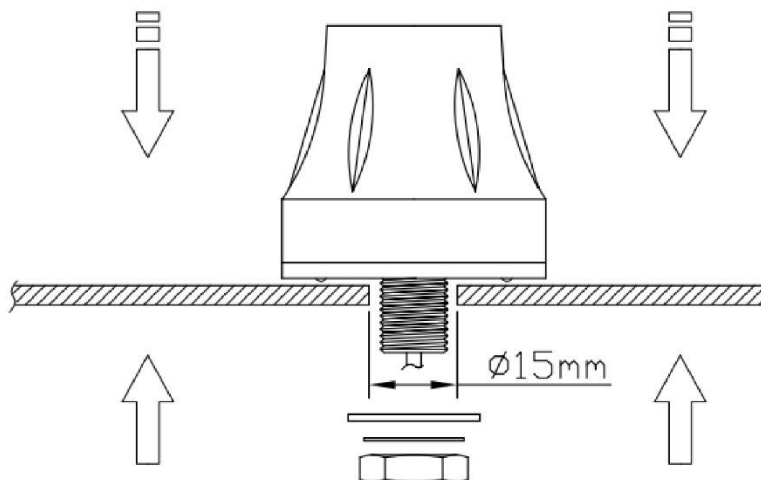
7.7.2 Environmental Conditions

Temperature range	-40 °C ... +85 °C
Storage temperature	-40 °C ... +85 °C
Casing	non-condensing 65 °C, 95 % RH

7.7.3 Mechanical Dimensions



Position	Function	Material
1	Housing top	ABS black
2	Housing bottom	ABS black
3	Gasket	POM red
4	Multi-tooth washer	Iron zinc
5	Nut M12	Copper-nickel
6	RG-316	FEP brown
7	Heat shrink tube	PE black
8	RP-SMA(M) ST	Brass alu plated
9	O-Ring	NBR black
10	Label	PET white



7.8 RAR 2212 – WIFI Antenna, Dual-Band



Article number	RAR 2212
Features	2.4 GHz and 5 GHz WIFI Peak gain straight: maximum 2.8 dBi Peak gain 90° bent: maximum 2.7 dBi CE Certified 360° Rotation RoHS-compliant RP-SMA male 6 cm long
Compatibility	RAR 2410; RAR 2415

7.8.1 Electrical

Communication System	Wi-Fi 2.4 GHz
Frequency [MHz]	2400-2500
Efficiency straight*	maximum 76,7 %
Efficiency 90° bent*	maximum 75,9 %
Average gain*	-1.2
Peak gain straight*	maximum 2.8 dBi
Peak gain 90° bent*	maximum 2.7 dBi
Impedance	50 Ω
Polarization	Linear
Radiation pattern	Omni-directional
Max power input	10 W

(*) in free space

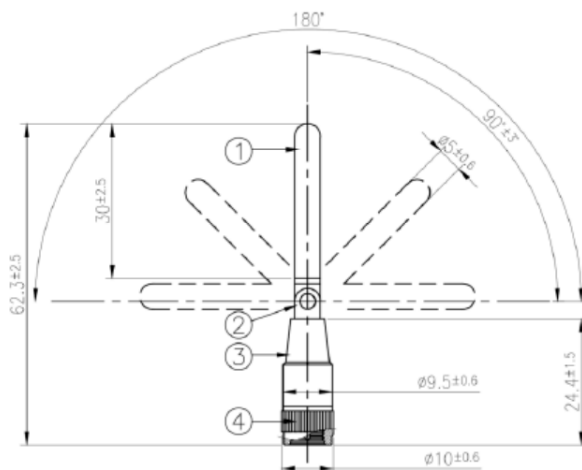
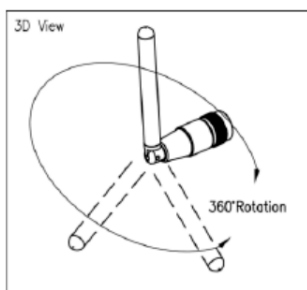
Communication System	Wi-Fi 5 GHz
Frequency [MHz]	5150-5850
Efficiency straight*	maximum 87.5 %
Efficiency 90° bent*	maximum 82.1 %
Average gain straight*	-0.6 dBi
Average gain 90° bend*	-0.9 dBi
Peak gain straight*	maximum 3.6 dBi
Peak gain 90° bent*	maximum 2.8 dBi
Impedance	50 Ω
Polarization	Linear
Radiation pattern	Omni-directional
Max power input	50 W

(*) in free space

7.8.2 Environmental Conditions

Temperature range	-40 °C ... +85 °C
Storage temperature	-40 °C ... +85 °C

7.8.3 Mechanical Dimensions



8 Compliance

8.1 Applicable European Directives

The RAR 24XX is in conformity with the provisions of the following European Directives.

Directive	Description
EMC Directive 2014/30/EU	Electromagnetic Compatibility
Radio Equipment Directive 2014/53/EU	Regulation of radio equipment
RoHS Directive 2015/863	Restriction of hazardous substances
REACH Directive 1907/2006	Regulation and registration of chemicals
WEEE Directive 2012/19	Waste of electronic equipment

8.2 Applicable Safety Standards

The RAR 24XX was tested and passed the following standards.

Standard	Description
EN 55032	Electromagnetic Compatibility of Multimedia Equipment
EN 301 489-1	EMC Standard for Radio Equipment and Services, Part 1: Common technical requirements
EN 301 489-3	EMC Standard for Radio Equipment and Services, Part 3: Specific conditions for Short-range devices.
EN 61000-4-2	Electrostatic discharge immunity test
EN 61000-4-3	Radiated, Radio-frequency, Electromagnetic Field Immunity Test 80-1000 MHz
EN 61000-4-4	Burst Immunity Test
EN 61000-4-5	Surge Immunity Test
EN 61000-4-6	Immunity to Conducted Disturbances, Induced by Radio-frequency Fields
IEC 60950-1 + Amendment 1 and Amendment 2	Information Technology Equipment Safety, Part 1: General Requirements - Edition 2
CSA C22.2 No. 60950-1-07 + Amendment 1 and Amendment 2	Information Technology Equipment Safety, Part 1: General Requirements - Edition 2

8.3 FCC Compliance

The base equipment (an unintentional radiator) has been tested and complies with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or TV reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help



Changes or modifications of this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The RAR 24XX contains different FCC-certified modules, depending on the variant.

Type	Enclosed module	FCC IDs
RAR 2400	-	-
RAR 2405	4G	XMR201903EG25G
RAR 2410	Wi-Fi	XPYLILYW1
RAR 2415	4G & Wi-Fi	XMR201903EG25G, XPYLILYW1

Additional information for variants with wireless capabilities

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

The antenna(s) used with this transmitter must be installed with a separation distance of at least 20 cm from all persons and must not be co-located or operated in conjunction with any other antennas or transmitters. Only those antenna(s) tested with the wireless transmitters or similar antenna(s) with equal or lesser gain may be used.

8.4 Certifications

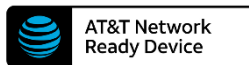
The RAR 24XX has been certified for:

- **CE** certification (for more information, see our Declaration of Conformance, REACH and RoHS declarations)
- **FCC** verification



The RAR 24XX 4G-A has additionally been certified for:

- **AT&T** certification



Documentation Changes

Change date	Affected page(s)	Chapter	Note
15.02.2019	17-33	7 Accessories	Chapter Accessories added
04.03.3019	6	2.2 Hardware Overview	Figure changed
14.08.2019		Entire document	4g-E replaced by 4G-G
04.06.2020	29	7.6 RAR 2210 – WIFI Antenna, Monopole	RAR 2415 added for Compatibility
	31	7.7 RAR 2211 – WIFI-An-tenna, Screw Mount	RAR 2415 added for Compatibility
13.12.2021	17	7 Accessories	Compatibility extended for the modules updated
	35	8.3 FCC Compliance	
05.06.2024	7	3 Technical Data	UL added
17.06.2025	24	7.4 RAR 2204	Chapter added

