

RackSense Features & Specifications - U – Level Asset Tracking System

© 2021 Vacus Tech Private Limited. All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights. Data is subject to change.

Date of release: December 2021

KEY CONTENTS

1. Introduction to RackSense	3
2. Rack Monitor	4
3. Asset Tag	6
4. Slave Gateway	8
5. Master Gateway	10
6. System Deployment	12
7. Note	15

Introduction to RackSense for Intelligent Datacentre

'**RackSense**' is our flagship product line based on our patented narrowband radio technology for enabling & providing a path-breaking solution for Indoor Positioning and Tracking needs of a datacentre. The **RackSense** product line provides a complete hardware & wireless networking platform to enable solutions for use cases such as – asset tracking & safety, capacity planning, facility heat mapping etc. These use case could be deployed across several industry segments such as - Enterprise, Logistics and Warehousing. The current document of **RackSense** is for **Wireless U – Level Asset Tracking System** used to track location of servers/ network equipment in a datacentre.

The Wireless U – Level Asset Tracking System consists of:

1. Rack Monitor
2. Asset Tag
3. Slave Gateway
4. Master Gateway

By implementing Vacus's **Wireless U – Level Asset Tracking System**, one can easily monitor real – time location status of an asset also, act on alerts generated by the system for pre-set alerts/thresholds for said parameters. This saves operational assets from damage, misplaced and enable optimal functioning.

Rack Monitor

The Rack Monitor is an intelligent radio unit in the Rack Sense solution. The Rack Monitor consists of DAAS (Distributed Antenna Array System) which measures distance of an asset tag from Antenna 0. The Rack Monitor forwards the distance data to slave gateway wirelessly.



Rack Monitor size is customizable and depends on the size of the rack (e.g. 36U, 42U etc.). For ease of installation, magnetic attachments are provided for rack monitor.

Rack Monitors are equipped with visual and audio alert for asset installation & search assistance.

Alerts such as falling from a height, tampering of the box are detected by the Rack Monitor and sent to the dashboard.

Features & Benefits:

Multi-Protocol support for easy integration

Supports up to 2000 tags within reception range

Customizable Size

Tamper alerts

Rack Monitor Specifications

OPERATION	
Operating Frequency	866 MHz/ 915 MHz/ 2400 MHz
Typical Reception Range	Up to 20 meters
Transmit Power	0 dBm
Network Interface & Protocols	CSMA
Encryption used	AES 128-bit
Data Storage	NA

ENCLOSURE DIMENSIONS (42U Rack)	
Case Length	50 mm
Case Width	40 mm
Case Height	1900 mm
Case Weight (with sensor)	400g
Construction	Polycarbonate
Durability	Tough, impact resistant and temperature stable
Mounting Options	Magnetic Mountings

ENVIRONMENTAL	
Operating Temperature	-20° C to +70° C
Storage Temperature	-40° C to +80° C
Operating Humidity	< 95% RH non-condensing; not recommended for outdoor applications
Sealing	IP 4X

POWER	
Type	AC (230 V, 50 Hz), PoE
Current consumption	2 A (Peak)
Power source optional	Supplied with the Enclosure

Asset Tag

An Asset Tag is a battery operated wireless sensor that is to be attached to the items that needs to be tracked. Asset Tag consists of an Omni-directional antenna for accurate signal parameter measurement. For longer battery life, asset tags are motion triggered. In case of no movement, asset tags enters in deep sleep mode.



Asset Tags are installed to servers/ network equipment either using a 3M tape or through a hook depending on the physical structure.

Asset Tags are equipped with visual and audio alert for asset installation & search assistance.

Alerts such as falling from a height, tampering of the box are detected by the Rack Monitor and sent to the dashboard.

Asset Tags supports OTA for a defined set of parameters such as location update rate, transmit frequency & channel, transmit power etc.

Features & Benefits:

OTA (Over The Air) Upgrade Support

Long – Battery Life*

No interference with existing system

Free-fall, Tamper alerts

Asset Tag Specifications

OPERATION	
Operating Frequency	866 MHz/ 915 MHz/ 2400 MHz
Typical Reception Range	Up to 20 meters
Transmit Power	0 dBm
Network Interface & Protocols	CSMA
Encryption used	AES 128-bit
Data Storage	NA

ENCLOSURE DIMENSIONS (42U Rack)	
Case Length	70 mm
Case Width	40 mm
Case Height	10 mm
Case Weight (with sensor)	80g
Construction	ABS
Durability	Tough, impact resistant and temperature stable
Mounting Options	3M tape, hook

ENVIRONMENTAL	
Operating Temperature	-20° C to +70° C
Storage Temperature	-40° C to +80° C
Operating Humidity	< 95% RH non-condensing; not recommended for outdoor applications
Sealing	IP 4X

POWER	
Battery Type	Lithium CR2450 Coin Cell
Battery Life	5 Years*

Slave Gateway

The Slave Gateway is a collector unit in the RackSense solution. The Slave Gateway collects computed asset tag location data wirelessly from Rack Monitor within range, applies basic filtering algorithm and forwards it to Master Gateway over MQTT protocol.



Slave Gateway consists of one relay socket with a capacity of 230 V, 8A and five I/O pins which can be controlled by software rule engine

Alerts such as falling from a height, tampering of the box are detected by the Slave Gateway and sent to the dashboard.

Features & Benefits:

Multi-Protocol support for easy integration

Supports up to 100 Rack Monitors within reception range

Controllable IO through software

Tamper alerts

Slave Gateway Specifications

OPERATION	
Operating Frequency	866 MHz/ 915 MHz/ 2400 MHz
Typical Reception Range	Up to 20 meters
Transmit Power	NA
Network Interface & Protocols	MQTT
Encryption used	AES 128-bit
Data Storage	Can store up to 4GB in case of connectivity loss
Certifications	RoHS, CE
Integration Support	Wi-Fi - 2.4GHz & 5GHz - IEEE802.11.b/g/n/ac, Bluetooth 4.2 BLE SNMP v1.0, v2.0 & v3.0, Modbus TCP/IP

ENCLOSURE DIMENSIONS (42U Rack)	
Case Length	141 mm
Case Width	173 mm
Case Height	25 mm
Case Weight (with sensor)	270g
Construction	Polycarbonate
Durability	Tough, impact resistant and temperature stable
Mounting Options	Magnetic Mountings

ENVIRONMENTAL	
Operating Temperature	-20° C to +70° C
Storage Temperature	-40° C to +80° C
Operating Humidity	< 95% RH non-condensing; not recommended for outdoor applications
Sealing	IP 4X

POWER	
Type	AC (230 V, 50 Hz), PoE
Current consumption	2 A (Peak)
Power source optional	Supplied with the Enclosure

Master Gateway

The Master Gateway is an entry/exit door in the RackSense solution. Master Gateway is a single point of connection for data exchange between DCIM application and a hardware system. Master Gateway supports SNMP and MQTT protocol.



Master Gateway consists of Intel Atom x5-E3940 with 1.8GHz clock. It can take the load of up to 10,000 radio nodes integration over SNMP with a DCIM Application. A master can connect up to 30 of slave gateways* (System Update Rate = 15 secs)

Alerts such as falling from a height, tampering of the box are detected by the Master Gateway and sent to the dashboard.

Features & Benefits:

SPOC for 3rd party application integration

Supports up to 10000 radio nodes

Multiprotocol Support for integration

Tamper alerts

Master Gateway Specifications

OPERATION	
Operating Frequency	866 MHz/ 915 MHz/ 2400 MHz
Typical Reception Range	NA
Transmit Power	NA
Network Interface & Protocols	Ethernet & MQTT
Encryption used	AES 128-bit
Data Storage	NA
Certifications	RoHS, CE
Integration Support	SNMP v1.0, v2.0 & v3.0

ENCLOSURE DIMENSIONS (42U Rack)	
Case Length	141 mm
Case Width	173 mm
Case Height	25 mm
Case Weight (with sensor)	270g
Construction	Polycarbonate
Durability	Tough, impact resistant and temperature stable
Mounting Options	Magnetic Mountings

ENVIRONMENTAL	
Operating Temperature	-20° C to +70° C
Storage Temperature	-40° C to +80° C
Operating Humidity	< 95% RH non-condensing; not recommended for outdoor applications
Sealing	IP 4X

POWER	
Type	AC (230 V, 50 Hz), PoE
Current consumption	2 A (Peak)
Power source optional	Supplied with the Enclosure

Rack Monitor Deployment SOPs:

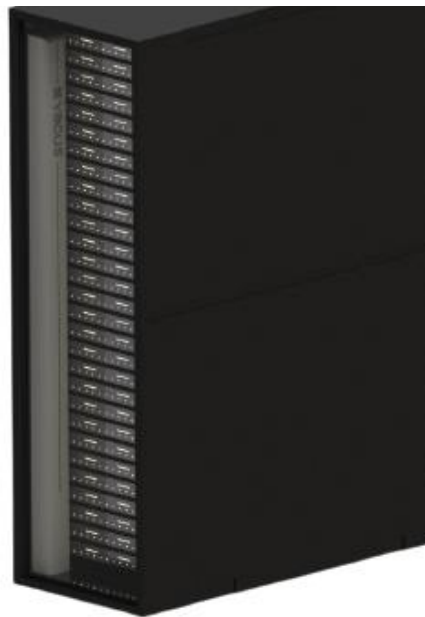


Fig-I: Recommended Rack Monitor mounting position on the left side of a Rack

Asset Tag Deployment SOPs:

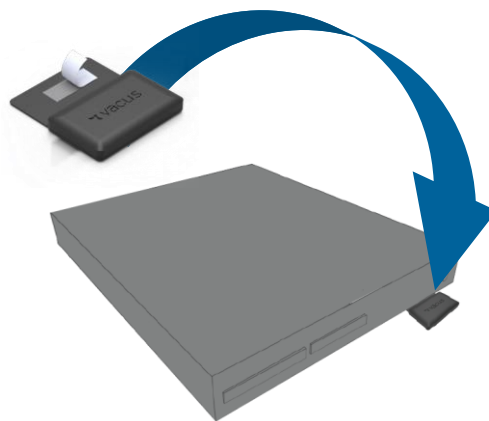


Fig-II: Asset Tag is attached to the underside of server using a 3M adhesive tape or a hook

Slave Gateway Deployment SOPs:

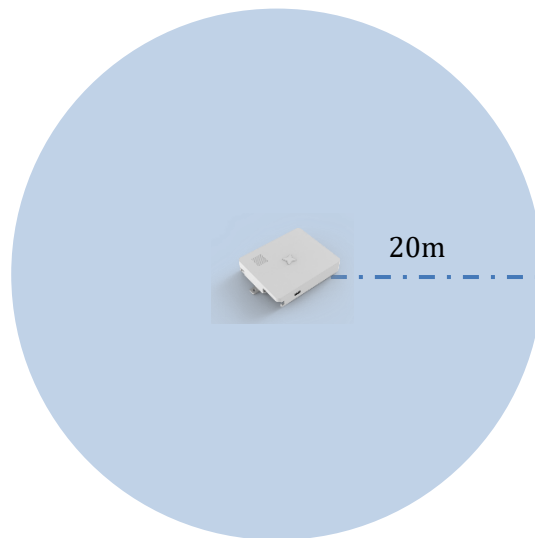


Fig-III: Slave Gateway showing circle of reception



Fig-IV: Recommended Slave Gateway mounting position at height between 2.5m to 4.5m from the floor.

A Note – Impact of RackSense on Enterprise Wi-Fi network used for IT communication.

The impact of the environmental sensor on the IT Wi-Fi network depends on following three factors:

1. The power of the wireless transmission
2. The distance from the emission source
3. Type of equipment in the path of the transmission.

The RackSense range of products from Vacus Tech does not have any negative effect on IT equipment in an enterprise environment or in similar environments like telecommunications centres as it operates in a sub GHz band (0.512 MHz) at a very low power (0dBm). With significant deployments there has never been a report of data loss or degradation in any storage or security device due to the presence and/or operation of CRF sensors and gateways.

WARRANTY STATEMENT

Vacus warrants all tags to be free from defects in materials and workmanship for a period of one year. Based on the ratings and specifications from the battery manufacturers, Vacus develops usage models to calculate the life of the active Tags. Like all models there are assumptions and approximations involved. The values are to be taken as engineering estimates – not guaranteed performance. In most asset tag deployment scenarios, tags with a 15-second rate have a useful life of five years. Exposure to extreme temperatures for all tags will shorten the battery life.

Vacus Tech Private Limited
 731, 7th cross, 3rd Block,
 Koramangala
 Bengaluru, IN 560034

Visit Us at: www.vacustech.com
 Mail at: support@vacustech.com
 Contact: +91-7204705645