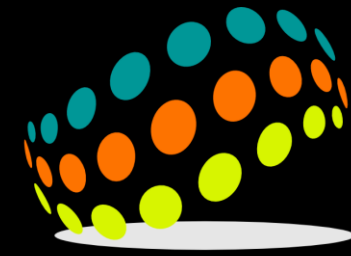


# RAMAC™

Solution Overview



**G-Matrix Systems**

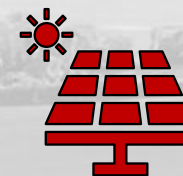
Integrated System Design

# Camera Pole Solution Overview



## Asset Lock Camera Pole Lock

Site Access Control  
Cabinet Access Control  
Battery Safes Access Control



## Asset Tracker

Solar Panel Tracking  
Copper Cable Theft



## RAMAC Portal & Mobile App

Data Visualization Tool  
Project Management Tool  
Audit Trail



## Vibration Sensor

Tower Integrity  
Perimeter Breach Detection



## Magnetic Sensor

Generator tamper monitoring



## Battery Tracker

Early Movement Alarm  
GPS Tracking



# G-Matrix Systems

## Integrated System Design

**G-Matrix Systems** addresses the modern need for monitoring through a range of bespoke IOT communications solutions, from cold chain monitoring, to security and entry control, tracking, fluid measurement and more.

G-Matrix Systems is a **Full IoT Turn-key** solution provider and is completely network Agnostic

### CONTACT US

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[www.g-matrixsystems.com](http://www.g-matrixsystems.com)

TEL: +27 87 803 9987

Cell: +27 63 6999 586

## Our Core Business

### RESEARCH & DEVELOPMENT

Internal R&D for product enhancement ensuring G-Matrix is always ahead of the curve with future Technologies.



### RAPID PROTOTYPING

The G-Matrix Systems “Heart” is an all-encompassing device which allows for multiple sensors to be connected allowing rapid prototyping. This, together with our in-house 3D printers ensures prototypes are aligned with Customer expectations



### PRODUCTION

40 000+ GPS units pass through our Test jigs every month supported by the G-Matrix test data base and monthly SLA



"A Good company delivers excellent products and services.  
Great companies does all that and strives to make the world  
a better place"

*Bill Ford* - Executive Chairman of *Ford* Motor Company

## Our Services

- Electronic Firmware Development in right down to microprocessors
- Low Power Products – Sigfox, LORA, GSM, Low Power Radio, BLE, Solar powered, NB-IoT, RPMA, M-CAT1, MQTT Products.
- Labview Software Development
- Electronic and Mechanical Interfacing.
- Development on "Internet of Things" networks
- Integration on 3<sup>rd</sup> party Platforms
- Deployment of LPWAN networks
- Intensive research and development in Sigfox, Lora, BLE, Wi-Fi & GSM communication
- Management Systems for remote communication
- Development of smartphone application.

## Current Products

# RAMAC™

Remote Access Management and Control Systems

- Cold Storage Monitoring
  - Smart Location Button
  - Range Detector
  - Remote Lock Monitor and driver
  - Cable Theft Solution
  - Asset Tracker
  - Temperature Sensor
  - Power State Monitor
  - Tamper Proof Container Locks
  - Intrusion protection Sensors
  - Vibration Sensor
  - Magnetic Sensor
  - Power consumption and Battery monitor
  - Camera Pole Maintenance Monitoring
- RAMAC™ Portal is a ready to use online web-based portal, available to any customer
  - RAMAC™ App allows local device configuration, OTA Firmware updates, diagnostics and real time information of the device
  - RAMAC™ Cerebro is a consumer facing App which can be white labelled for our channel partners
  - RAMAC™ API allows for easy integration



**G-Matrix Systems**  
Integrated System Design

# Our IoT Footprint



## Remote Access Management and Control Systems

September 01, 2021 10:54:59 WED

Akheel Jame...

Account:

All Accounts

Device Types:

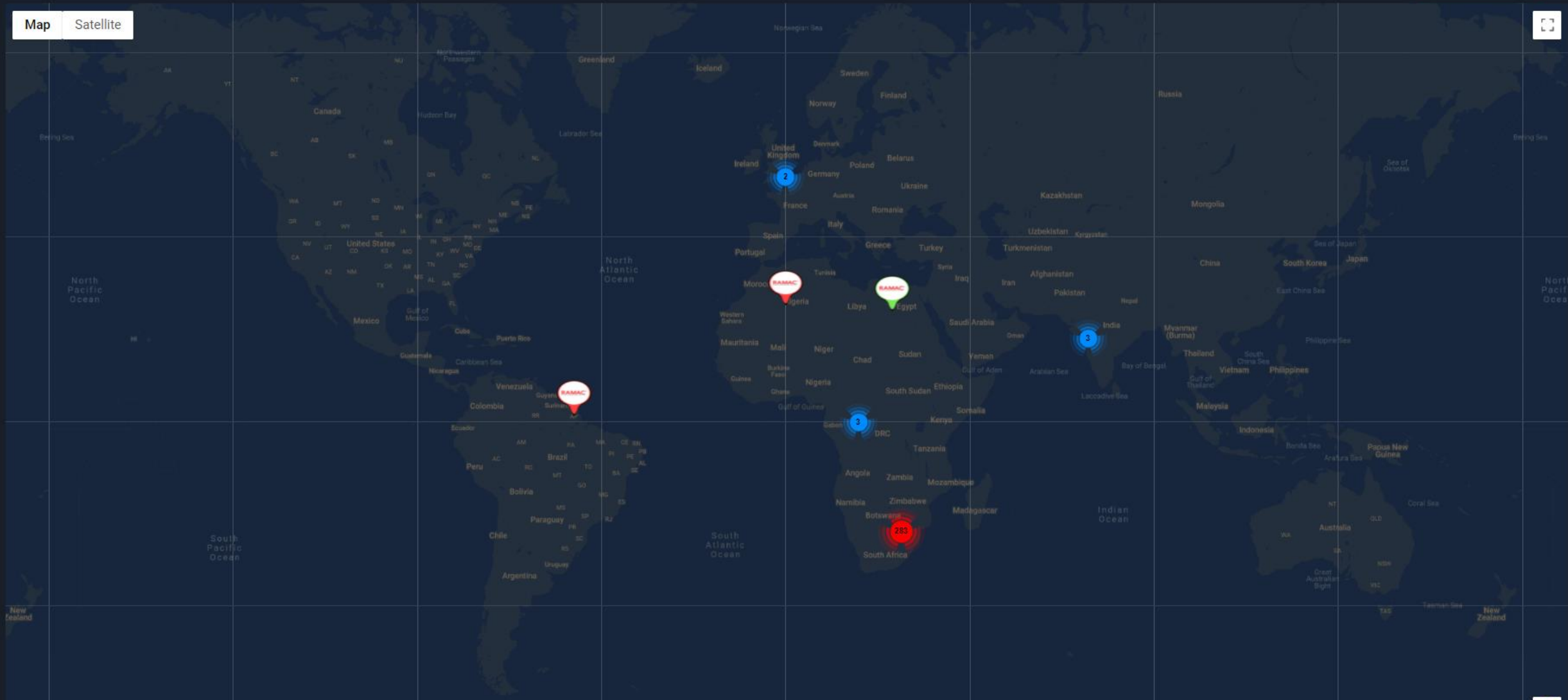
All Device Types

Devices:

All Devices

Total Devices : 433

Map Satellite

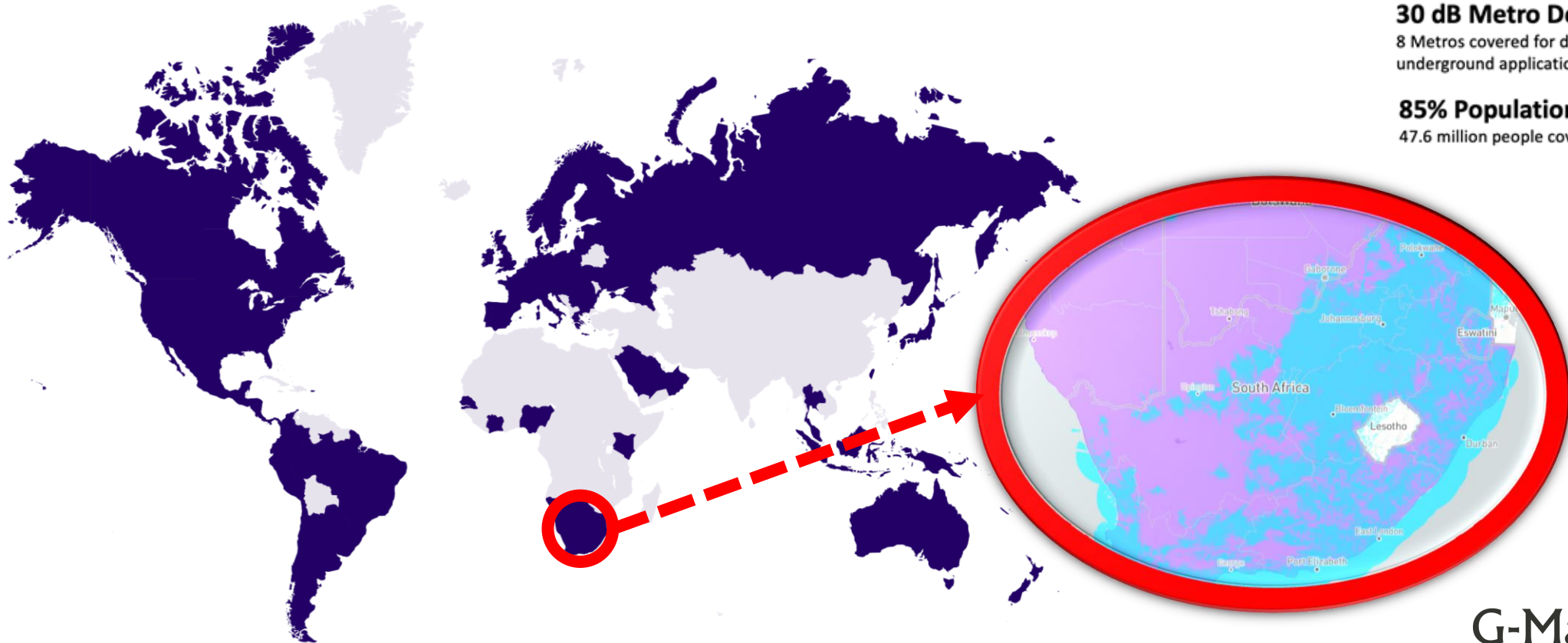


# The Global Network



## A worldwide footprint

Sigfox 0G network is already available in 72 countries and regions



**SqwidNET**  
A DFA COMPANY

**93% Population Covered**  
52 million people covered

**90% Coverage on Highways**  
143 952 km of paved roads covered  
538 829 km of gravel road covered

**30 dB Metro Densification**  
8 Metros covered for deep inbuilding and underground applications

**85% Population covered at 20dB**  
47.6 million people covered for indoor applications



**G-Matrix Systems**  
Integrated System Design



The **RAMAC™-Remote Lock and Vibration Sensor** allows remote monitoring and local remote locking via a Servo Motor. The RAMAC-Remote Lock and Vibration Sensor monitors the angle of the device and once the angle exceeds the configured limits the unit will transmit an alert message.

### Key Features

- Local remote locking and unlocking of the Enclosures is done by an operator using the RAMAC™ Mobile Application (RMA), following a work order scheduled by an administrator on the RAMAC™ Portal (or by using API calls).
- Lock and Unlock status messages are sent to the RAMAC™ Portal for asset monitoring purposes.
- Long Range real-time Communication utilizing SigFox compliant radio networks
- Small form factor, simple installation
- Battery status notification
- Tamper detection alarms
- Authorized access alerts
- High Temperature status notification
- API and Call-back configuration
- Mobile application IOS and Android
- RAMAC™ portal for device management, Remote monitoring and event reporting



# Pulse Sensor (PS2)

## Track your consumption for consumer rebates

The **RAMAC™ - Pulse Sensor** monitors the electrical energy consumed by a connected load by counting the pulse **per kilo watt-hour** of output from the connected electrical energy meter hence allowing the RAMAC- Pulse Sensor to determine the total energy usage. 2 energy values are measured i.e. a total accumulated watt-hour value and a settable interval watt-hour value. The interval watt-hour value will reset with the start of every new interval. The default interval is set to one-hour intervals.



### Pulse Sensor

Pulse Energy measurement per kilowatt-hour as transmitted on set interval by installer and accumulative consumption daily.



### Input Voltage Sensor

Monitors the voltage supplied to the unit to power allowing self diagnosis and predictive maintenance



### Magnetic Sensor

Monitors Magnetic presence for Door Open or Closed



**G-Matrix Systems**  
Integrated System Design



# Magnetic Door Sensor (ENC1)

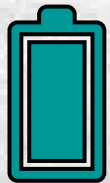
## Monitor the enclosure for tampering

The **RAMAC Magnetic Sensor** reports back on the SigFox Network to the RAMAC™ portal. The Device monitors the opening and closing of enclosures via a Magnetic Sensor whether it be on doors, windows, security gates and more. This solution is perfect for sliding doors as the Magnetic Sensor will send an alert when the Magnet is no longer present.



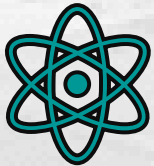
### Magnetic Sensor

Once the enclosure is opened the device will transmit a Tamper Alert. Multiple Magnet inputs can be connected in series on request.



### Low Power Consumption

IoT networks such as Sigfox and Lora allow the device to operate autonomously for up to 5 years.



### 3- Axis Accelerometer

The 3-Axis accelerometer allows the RAMAC- Asset Tracker enter an ultra-low power state yet still wakeup when movement occurs.

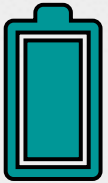


### GPS Position for faster response

Once the Movement is detected, the unit transmits an alert with the position captured by the operator during installation.



The **RAMAC™-Asset Tracker** monitors the remote movement of Assets and tampering of enclosures. The device is attached to the Asset and continuously evaluates the Asset for significant movement or magnetic presence. If significant movement is detected while the device is in the armed state it will send a movement status message. It will start tracking the movement by using the built-in GPS unit. The GPS locations are sent at 5-minute intervals and the device will continue to send GPS locations until movement stops.



### Low Power Consumption

IoT networks such as Sigfox and Lora allow the device to operate autonomously for up to 5 years.



### 3- Axis Accelerometer

The 3-Axis accelerometer allows the RAMAC- Asset Tracker enter an ultra-low power state yet still wakeup when movement occurs.



### Magnetic Sensor

Once the enclosure is opened the device will transmit a Tamper Alert



### GPS

Once the Movement is detected, the device starts transmitting GPS Positions every 5 minutes.



The **RAMAC™-Asset Tracker** monitors the remote movement of Assets and tampering of enclosures. The device is attached to the Asset and continuously evaluates the Asset for significant movement or magnetic presence. If significant movement is detected while the device is in the armed state it will send a movement status message. It will start tracking the movement by using the built-in GPS unit. The GPS locations are sent at 10-minute intervals and the device will continue to send GPS locations until movement stops.



### Low Power Consumption

IoT networks such as Sigfox and Lora allow the device to operate autonomously for up to 5 years.



### 3- Axis Accelerometer

The 3-Axis accelerometer allows the RAMAC- Asset Tracker enter an ultra-low power state yet still wakeup when movement occurs.



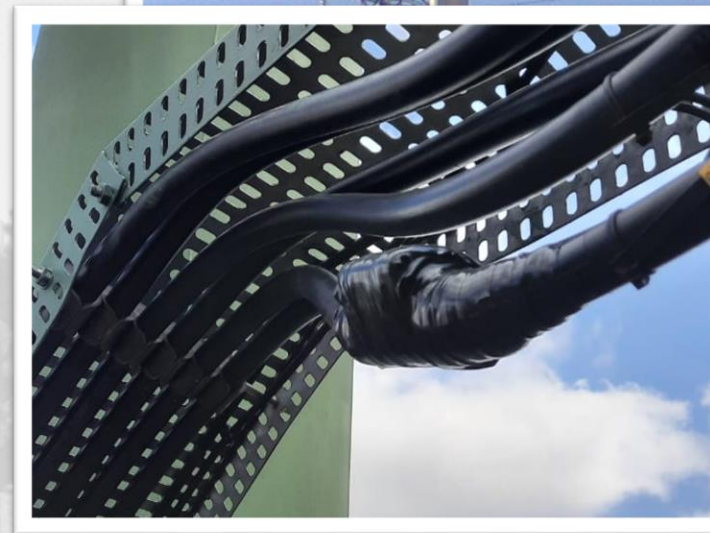
### Magnetic Sensor

Once the enclosure is opened the device will transmit a Tamper Alert

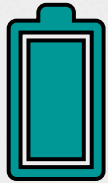


### GPS

Once the Movement is detected, the device starts transmitting GPS Positions every 10 minutes.



The **RAMAC™-Asset Tracker** monitors the remote movement of Assets and tampering. The device is installed inside the battery and continuously evaluates the battery for significant movement. If significant movement is detected while the device is in the armed state it will send a movement status message. It will start tracking the movement by using the built-in GPS unit. The GPS locations are sent at 10-minute intervals and the device will continue to send GPS locations until movement stops where it will self calibrate and re-arm.



### Low Power Consumption

IoT networks such as Sigfox and Lora allow the device to operate autonomously for up to 5 years.



### 3- Axis Accelerometer

The 3-Axis accelerometer allows the Battery Tracker enter an ultra-low power state yet still wakeup when movement occurs.



### GPS

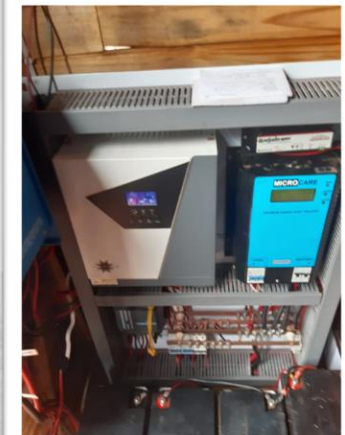
Once the Movement is detected, the device starts transmitting GPS Positions every 10 minutes.

In November 2021, A large Mine company received **full ROI within 14 days** thanks to our solution.

The mine bought 10 Batteries with Tracking devices installed inside. Devices were installed in the beginning of the month and 14 days later, 4 batteries were stolen.

Using the RAMAC Platform, security teams recovered 24 batteries with Solar Panels, Rectifiers, controllers, circuit breakers etc.

The full amount of **only their** recovered assets was **over R300k** with additional assets from external sources as well.

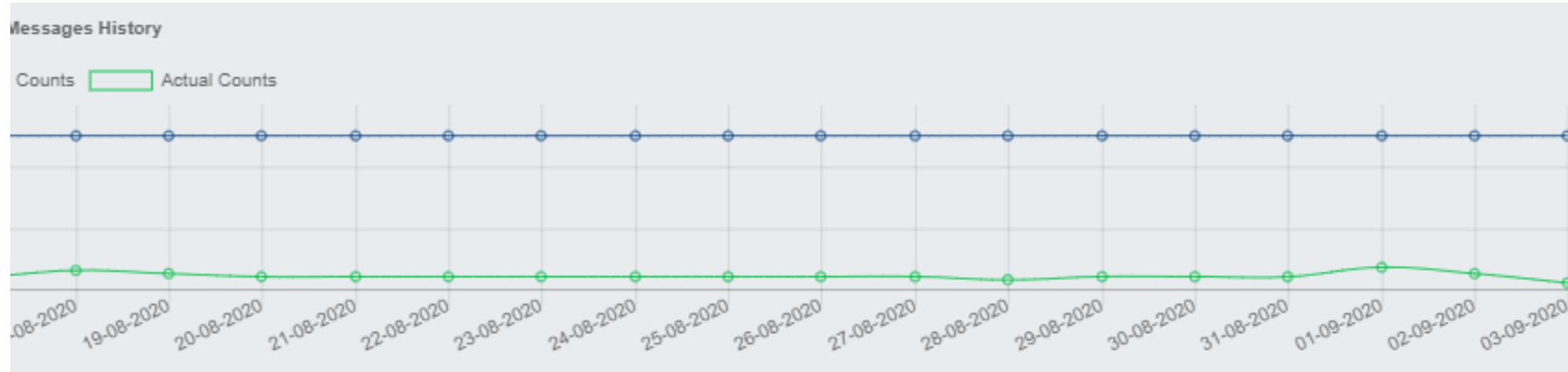


# RAMAC™ Power State Monitor (PM1)



G-Matrix Systems  
Integrated System Design

The Power State Monitoring Device is a **self powered device** which is designed to monitor the presence of power running through a socket. The Device transmits alerts based on change of state therefore a great solution for ensuring there is always current available for appliances plugged into the Socket. This can be used for household appliances to server rooms.



To Power Inlet



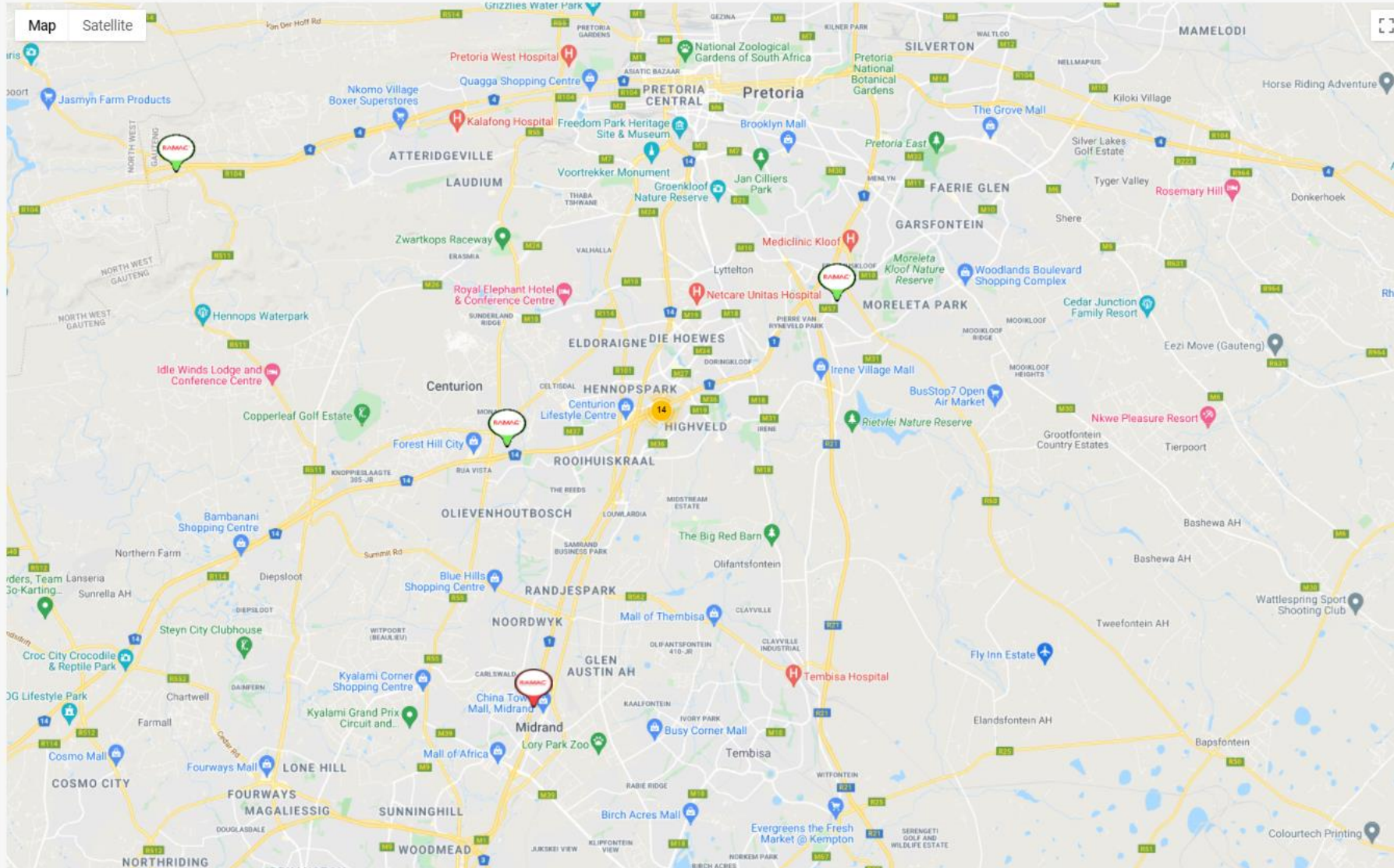
Messages History 2020-09-01

SR.NO	TIME	ASSET POWER STATUS	OPERATOR NAME	BATTERY	TEMPERATURE	MAP
292221	2020-09-01 21:58:12		Not found	3.7	16.00	
292203	2020-09-01 20:59:08		Not found	3.7	18.00	
292081	2020-09-01 15:02:22		Not found	3.7	18.00	
292057	2020-09-01 13:14:32		Not found	3.7	21.00	
292051	2020-09-01 12:59:11		Not found	3.7	20.00	
291964	2020-09-01 06:55:39		Not found	3.7	17.00	
291885	2020-09-01 00:52:05		Not found	3.7	18.00	



Account: All Accounts Device Types: RAMAC AT1 Devices: All Devices

Alerting Devices



### Devices Having Alert

11 (Alert Devices) / 32 (Total Devices)

Show All

DEVICE ID	DEVICE TYPE	ALARM STATUS	LAST SEEN
<a href="#">C74604</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	12 minutes ago
<a href="#">C5007B</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	1 hour ago
<a href="#">C4DD3B</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	1 hour ago
<a href="#">C4DD2C</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	1 hour ago
<a href="#">C12ED1</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	1 hour ago
<a href="#">C4D277</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	1 hour ago
<a href="#">C6A9C1</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	1 hour ago
<a href="#">C57B76</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	1 day ago
<a href="#">C75DF9</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	8 days ago
<a href="#">C7690A</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	8 days ago
<a href="#">BFA048</a>	AT1	<span style="color: red;">!</span> <span style="color: green;">↻</span>	19 days ago

Alerts are sent via Email, Telegram with a map card and shown in the NOC Dashboard View.

The platform keeps an audit log of every alert sent from the portal and where it was sent.

Should any user reset the alarm they will need to supply a reason.

Every action like muting a unit, resetting an alarm, suspending a device is time stamp recorded with the user details for accountability reasons.

DEVICEID	ALERT TYPE	DATE TIME	VIEW MAP
C7258F	AT1 Movement Alarm	2021-11-11 13:34:52	No Location
C51581	State: -Armed -Not Alarming -Temperature Normal -Door Closed -New Location -Moving	2021-11-08 15:30:31	
C51581	State: -Armed -Not Alarming -Temperature Normal -Door Closed -New Location -Moving	2021-11-08 15:24:40	
C51581	State: -Armed -Not Alarming -Temperature Normal -Door Closed -New Location -Moving	2021-11-08 15:18:50	

ADD MEMBERS

Movement alarm for AT1 device  
Device:C6C3E5  
Description: \_Test 2  
Date:2021-08-23 19:38:38  
Account:V2 SALES DEMO  
<https://portal.ramac.io/vd/C6C3E5/19> 19:38

Movement alarm for AT1 device  
Device:C71A07  
Description: \_Test  
Date:2021-08-23 19:38:42  
Account:V2 SALES DEMO  
<https://portal.ramac.io/vd/C71A07/19> 19:38

P1 Device Location Update  
Device:C5005E  
Description:Akheel\_Goodwill  
Date:2021-08-23 19:41:23  
Account:V2 SALES DEMO  
Map:[Click Here](#) to view latest location on map

# Work Orders

09:27 72%

← Task

Jul 20 22 Wed  
Jul 20 23 Thu  
Jul 20 24 Fri  
Jul 20 25 Sat  
Jul 20 26 Sun

Order Type : NEW Pending

WorkId : 1164

Device Type Name : RAMAC T1

Province Name : Gauteng

Start Date : 2020-07-24 09:35:00

End Date : 2020-07-25 09:30:00

+

09:28 72%

Task History

09:31 71%

← RT1\_BFD96C

CONNECTED

CLOSED

3.6 V

20° C

09:33 70%

← BFD96C

DEVICE NAME

Enter device name

PHOTO TASKS (3)

Take a photo of the closed asset >

CHECKLIST TASKS (1)

Complete the following checklist >

QUESTIONSET TASKS (1)

Answer the following questions >

NOTE (1)

Enter any notes >

09:33 70%

← Obtain GPS Location

QUESTION NO.	TASK	ANSWER
1	Take a photo of the height installed in the ground	
2	Take a photo of the installed Device	





# Audit Log



May 28, 2021 07:55:16 FRI

[Home](#) / [Work Order History](#)

### Work Order History

NAVIGATION

- [Home](#)
- [Work Order](#)
- [Workorder Templates](#)
- [Maps](#)
- [Devices](#)
- [Replace Device](#)
- [Transfer Devices](#)
- [Update Subscription](#)
- [Device Notifications](#)
- [Masters](#)
- [Messages](#)
- [Message History](#)
- [Reports](#)
- [Alerts](#)
- [Accounts](#)
- [Integrations](#)
- [Users](#)
- [Notification Subscription Users](#)
- [Devices Audit Log](#)
- [Accounts Audit Log](#)
- [System Fault](#)

Start Date:  End Date:  Order Type:  Assigned User:  Device:

Status:

[Clear Search](#)  
Show  entries

WORK ORDER ID	WORK ORDER TEMPLATE	CLIENT	START DATE	END DATE	ORDER DATE	ORDER TYPE	DEVICE	STATUS	ASSIGNED TO	INSTALLATION DATE	ACTION
7697	Protea Coin	Protea Coin	2021-05-27 14:01:00	2021-05-27 15:16:00	2021-05-27 14:01:44	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	27-05-2021	<a href="#">View</a>
7696	Protea Coin	Protea Coin	2021-05-27 13:57:00	2021-05-27 15:15:00	2021-05-27 13:58:53	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	27-05-2021	<a href="#">View</a>
7695	Protea Coin	Protea Coin	2021-05-27 13:53:00	2021-05-27 15:16:00	2021-05-27 13:53:33	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	27-05-2021	<a href="#">View</a>
7654	Protea Coin	Protea Coin	2021-05-27 12:03:00	2021-05-27 14:15:00	2021-05-27 12:04:29	MAINTENANCE	C6A397	NEW	<a href="#">Kenneth Lindgren</a>	27-05-2021	<a href="#">View</a>
7653	Protea Coin	Protea Coin	2021-05-27 00:12:00	2021-05-27 13:10:00	2021-05-27 11:36:43	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	27-05-2021	<a href="#">View</a>
7652	Protea Coin	Protea Coin	2021-05-26 14:38:00	2021-05-26 16:25:00	2021-05-26 14:38:45	NEW	RAMAC MD1	NEW	<a href="#">Kenneth Lindgren</a>	-	<a href="#">View</a>
7590	Protea Coin	Protea Coin	2021-05-25 12:15:00	2021-05-25 13:45:00	2021-05-25 12:25:01	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	25-05-2021	<a href="#">View</a>
7591	Protea Coin	Protea Coin	2021-05-25 12:15:00	2021-05-25 13:45:00	2021-05-25 12:25:01	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	25-05-2021	<a href="#">View</a>
7592	Protea Coin	Protea Coin	2021-05-25 12:15:00	2021-05-25 13:45:00	2021-05-25 12:25:01	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	25-05-2021	<a href="#">View</a>
7593	Protea Coin	Protea Coin	2021-05-25 12:15:00	2021-05-25 13:45:00	2021-05-25 12:25:01	NEW	RAMAC MD1	COMPLETED	Kenneth Lindgren	25-05-2021	<a href="#">View</a>

Pulse Sensor



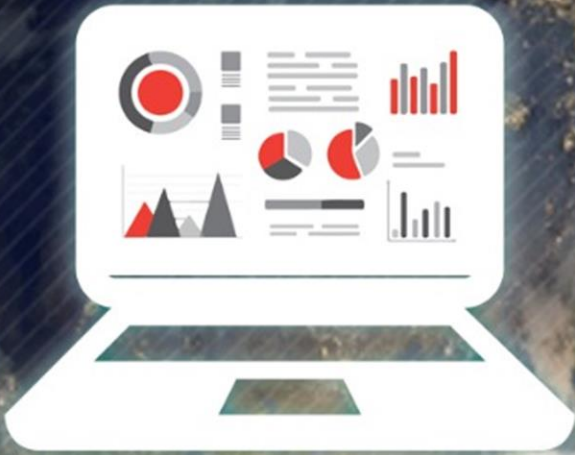
Cable Theft Sensor



Temperature Sensor



RAMAC™ Portal  
& Mobile App



Vibration Sensor



Remote Lock Unit



Smart Location  
Button



**RAMAC™**  
Remote Access Management and Control Systems

Power State Sensor



Asset Tracker



Magnet  
Sensor



Intrusion Protection



**G-Matrix Systems**  
Integrated System Design



# G-Matrix Systems

## Integrated System Design

**G-Matrix Systems** addresses the modern need for monitoring through a range of bespoke IOT communications solutions, from cold chain monitoring, to security and entry control, tracking, fluid measurement and more.

G-Matrix Systems is a full turn-key IOT solution provider.

## Contact Us

### **G-Matrix Systems (Pty) Ltd**

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