

# TAM-242/252/262 Installation and Operating Manual



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**TAM-242/252/262 Installation and Operator Manual**

Document Number: MAN-0059 Issue 4

**WASTE-ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) DIRECTIVE**



The European Parliament and the Council of the European Union have issued the Waste Electrical and Electronic Equipment Directive. The purpose of the Directive is the prevention of waste of electrical and electronic equipment, and to promote the re-use and recycling and other forms of recovery of such waste. As such the Directive concerns producers, distributors and consumers.

The WEEE directive requires that both manufacturers and end users dispose of electrical and electronic equipment and parts in an environmentally safe manner and that equipment and waste are re-used or recovered for their materials or energy.

Electrical and electronic equipment and parts must not be disposed of with ordinary household refuse. All electrical and electronic equipment and parts must be collected and disposed of separately. Products and equipment that must be collected for re-use, recycling and other forms of recovery are marked with the pictogram shown in above.

When disposing of electrical and electronic equipment by use of the collection systems available in your country, you protect the environment, human health and contribute to the prudent and rational use of natural resources. Collecting electrical and electronic equipment and waste prevents the potential contamination of nature with the hazardous substances that may be present in electrical and electronic products and equipment.

Your Dealer/Distributor will assist and advise you of the correct way of disposal in your country.

Amendment Record	
Issue	Description
1	Initial Issue
2	Updated battery safety information, added expected lifetime table, added charging time. Note added in chapter 4 about storage temperature.
3	Updated to include TAM-252 information. Change to battery life estimates. Declaration of Conformity added.
4	Updated to include TAM-262 information. Change to TAM-252 script behaviour. Correction to battery alarm threshold – it is 10% of capacity instead of 25%.

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# Preface

## General Safety Warnings



**WARNING:** This device contains static sensitive parts. There are no user-serviceable parts or fuses inside this device. Refer servicing only to qualified service personnel.



**WARNING:** This product contains magnetized material. Due care should be taken when handling fully magnetized material as physical personal injury may occur by the inadvertent attraction of magnetized material to other similar or ferro-magnetic material.



**WARNING:** Close proximity (less than 100mm) to the magnetized material may affect the operation of heart pacemakers.

### *Battery Safety*



**WARNING:** This product contains a rechargeable battery pack. To prevent physical injury, observe the following:

- Do not short circuit.
- Do not incinerate.
- Do not dispose of in fire.
- Only recharge the battery using the supplied charger.



**CAUTION: THERE IS THE RISK OF EXPLOSION IF THE BATTERY PACK IS REPLACED BY ONE THAT IS NOT SUPPLIED BY EMS GLOBAL TRACKING, OR IF THE BATTERY PACK IS ABUSED OR DISPOSED OF INCORRECTLY.**

Local and International regulations regarding the transport of batteries must be complied with. In particular, all packaging must be UN3090 approved. Contact [trackingsupport@emsglobaltracking.com](mailto:trackingsupport@emsglobaltracking.com) for further information.

### **Note:**

- Retain this manual for future reference.
- Observe all warnings on the equipment and in this manual.
- Follow all installation and operating instructions.
- Maximum Permissible Exposure (MPE) limits – This equipment complies with FCC (OET bulletin 65) general population/uncontrolled exposure limits as applied to RF energy from a Mobile device. (A mobile device being defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimetres is normally maintained between the transmitter's radiating structures and the body of the user or nearby persons.



# Chapter 1 - Unpacking

**Caution:** The equipment must be transported to the final installation site fully packed (as originally supplied) to avoid damage. Failure to transport the equipment with the correct packaging may invalidate any warranty claims.

All packaging should be retained until the equipment is installed on site and working correctly.

## Items Supplied

The TAM-242 (part number A142Bxx<sup>1</sup>) equipment is supplied with the following:

- B104B01 or B104B03 – Main Enclosure Assembly.
- 01708 – Adhesive Pad (qty 4)

The TAM-252 (part number A151Bxx) equipment is supplied with the following:

- B104B03 – Main Enclosure Assembly.
- 01708 – Adhesive Pad (qty 4)
- A159B01 – Alert Switch Cable 5m, actuator and mounting plates

The TAM-262 (part number A167Bxx) equipment is supplied with the following:

- B104B03 – Main Enclosure Assembly.
- 01708 – Adhesive Pad (qty 4)
- A166B01 – Panic Button Cable 3m

## Items not Supplied

- A147B01 – Single Charger
- A148B01 – Ten way charger
- MAN-0059 – TAM-242 & TAM-252 Installation & Operating Manual

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<sup>1</sup> The 'xx' in the part number represents a 2-digit numerical value that will vary depending on the default configuration of the unit. Contact [trackingsupport@emsglobaltracking.com](mailto:trackingsupport@emsglobaltracking.com) for more information on unit configurations.

# Chapter 2 – Introduction

## What is the TAM-242?

The TAM-242 (Figure 2-1) is a compact, low data rate, satellite terminal designed to operate over the INMARSAT satellites for use in tracking assets that have no integral power source. The terminal uses the INMARSAT IsatM2M protocol and provides global coverage and fully automatic roaming across all of the world's ocean regions, see Location on page 6 for more information.



Figure 2-1: TAM-242 Tracking and Monitoring Equipment

### **TAM-242 Main Module**

The TAM-242 incorporates a SAT-200 satellite modem mounted within the IP66 rated enclosure, containing the battery compartment and interface PCB.

The TAM-242 may either be permanently fitted to the asset or temporarily deployed utilising the four (4) magnets incorporated within the enclosure base.

### **Interface Connector, Key Switch, and LED**

The TAM-242 has one external interface connector which is used to charge the unit and a key switch that allows you to switch the terminal “On” and “Off”. This helps preserve the life of the battery when the terminal is not in use. Further instructions on the use of the key switch are contained in Key Switch Operation on page 8.



The TAM-242 incorporates a Light Emitting Diode (LED) which indicates the unit's status. During normal operations the LED intermittently flashes when the terminal is either transmitting a message or awaiting receipt of one. Once the terminal returns to "sleep" mode, the LED will cease flashing. During charging the LED will indicate the charge status of the battery. See Operational Status on page 10 for a description of the LED functions.

### ***Battery Pack***

The battery pack is a rechargeable sealed unit. The operational time of the unit before requiring recharging will be affected by the reporting interval between position reports. The remaining battery capacity is calculated internally and the terminal will send a report that includes the status of the battery with every position report. A Low Battery status will be activated when the remaining capacity has fallen below 10% +/- 5%.

The table below gives some approximate life expectancies with the supplied battery; these do not include the age of the battery and the effect of temperature on the battery and are provided only as guidance for the user:

<b>Reporting Interval</b>	<b>Lifetime</b>
15 minutes	up to 4 weeks
1 hour	up to 10 weeks
6 hours	up to 6 months

**Caution:** Before recharging the unit ensure that the key switch is in the "off" position. See Charging the Battery on page 12 for more information.

### ***Reporting Interval***

The Reporting Interval is the time between position reports, providing the GPS position of the asset, as well as other information such as battery status. Changing the reporting interval will affect the operational time between charges.

### ***Switch On Reporting***

Every time that the key switch is used to switch on the TAM-242, a position report will be sent to confirm correct operation, provided that the terminal can see the sky within 10 minutes of the power being applied. Position reporting will then continue at the programmed reporting interval.

### ***Receive Window***

After each routine position report, the terminal will enter "sleep" mode to conserve battery power. It will be unable to receive messages during this mode.

The terminal will "wake" up each day at approximately 1045 hrs UTC to enable it to receive any messages sent from the application.

### ***Battery Low Threshold***

The Battery Low alarm occurs typically when the battery reaches 10% +/- 5% charge capacity.

## **Quality of Service**

The TAM-242 has been designed so that the battery connection time randomises the start of position reporting. This maintains a high quality of service by avoiding network congestion which could occur with synchronised reporting across a population. Position reports for each TAM-242 will still arrive at the programmed reporting interval.

## **Limitations on Intended Operating Environment**

Guidance notes for the installation and use of the TAM-242 must be strictly followed. EMS Global Tracking exercises due diligence to ensure that the equipment is suitable for use, but ultimate responsibility for the compliance of a complete system rests with the installer and operator.

## **What is the TAM-252?**

The TAM-252 is a TAM-242 supplied with a magnetic proximity switch and actuator which can be used to monitor a moving object, such as a door.

### ***TAM-252 Proximity switch and actuator***

The proximity switch is mounted on the end of a cable that mates with the front panel connector on the TAM-242 unit. The actuator is a separate item that must be mounted so that in normal operation it is located next to the proximity switch.



*Figure 2-2: TAM-252 Proximity switch and actuator*

### ***Proximity switch status reporting***

When supplied as part of a TAM-252 kit, the TAM-242 unit will report the status of the proximity switch (OPEN or CLOSED). The switch is CLOSED when the actuator is mounted correctly next to the switch. The switch is OPEN when the actuator is not close enough to the switch, when the switch cable is not mated to the TAM-242 unit or when the switch cable is cut. When the switch status changes from CLOSED to OPEN, an extra position report is generated and an 'Alert' flag is set in the message. The TAM-242 will then generate further Alert messages for the next 4 hours at the defined Alert reporting interval. After 4 hours the unit will revert back to standard tracking messages at the normal reporting interval.

## What is the TAM-262?

The TAM-262 is a TAM-242 supplied with a panic button on the end of a 3m long cable.

### ***TAM-262 panic button***

The panic button is mounted on the end of a cable that mates with the front panel connector on the TAM-242 unit. See Figure 2-3.



*Figure 2-3: TAM-262 Panic button cable*

### ***Panic button status reporting***

When supplied as part of a TAM-262 kit, the TAM-242 unit will enter an Alert state based on the state of the panic button. The switch is normally CLOSED and changes to an OPEN state when the switch is pressed. When the switch status changes from CLOSED to OPEN, an extra position report is generated and an 'Alert' flag is set in the message. The TAM-242 will then generate further Alert messages for the next 4 hours at the defined Alert reporting interval. After 4 hours the unit will revert back to standard tracking messages at the normal reporting interval.

# Chapter 3 – Installation



**WARNING:** Installation and service should be carried out only by suitably qualified service personnel. Local working practices and regulations for wiring and installations must be adhered to.



**WARNING:** Refer to General Safety Warnings on page iii before installing or handling this product.

**Note:** The TAM-242 must be fully charged before deployment to enable accurate reporting of the remaining battery charge capacity, see Charging the Battery on page 12 for more information.

**Note:** The TAM-242 must be activated with a valid airtime package and also registered on the application website prior to installation.

**Note:** If you have not already done so, record the ISN and serial number located on the bottom of the TAM-242. This will be required for registration and warranty enquiries.

## Pre-Installation Survey

Before attempting to install the equipment, it is essential that a full survey of the proposed location is carried out and the following points taken into account. Failure to do so could result in the system malfunctioning.

### *Location*

- The TAM-242 should be located with an unobstructed, clear view of the sky.
- The TAM-242 should be mounted on a flat horizontal surface.
- The connector and key switch side of the TAM-242 must face the opposite direction of travel of the asset.
- Consider the position of the satellites (Figure 3-1). The Inmarsat satellites are in geostationary orbits above the equator. In the Northern hemisphere the satellites are located to the south, in the Southern hemisphere the satellites are located to the North. The further away from the Equator the asset is, the lower the angle of elevation will be above the horizon.
- The TAM-242 should be located on the highest point possible, free from obstructions and safe from damage during normal operation.

- For installations exposed to shock and/or vibration, use a mounting scheme that isolates the unit from the excessive shock and/or vibration.
- Choose a location that is not near other satellite communication equipment, and/or microwave dishes to prevent RF jamming.
- It is advisable to leave at least a 1 meter separation between the system and any other communications devices.
- Avoid mounting on a hot surface.

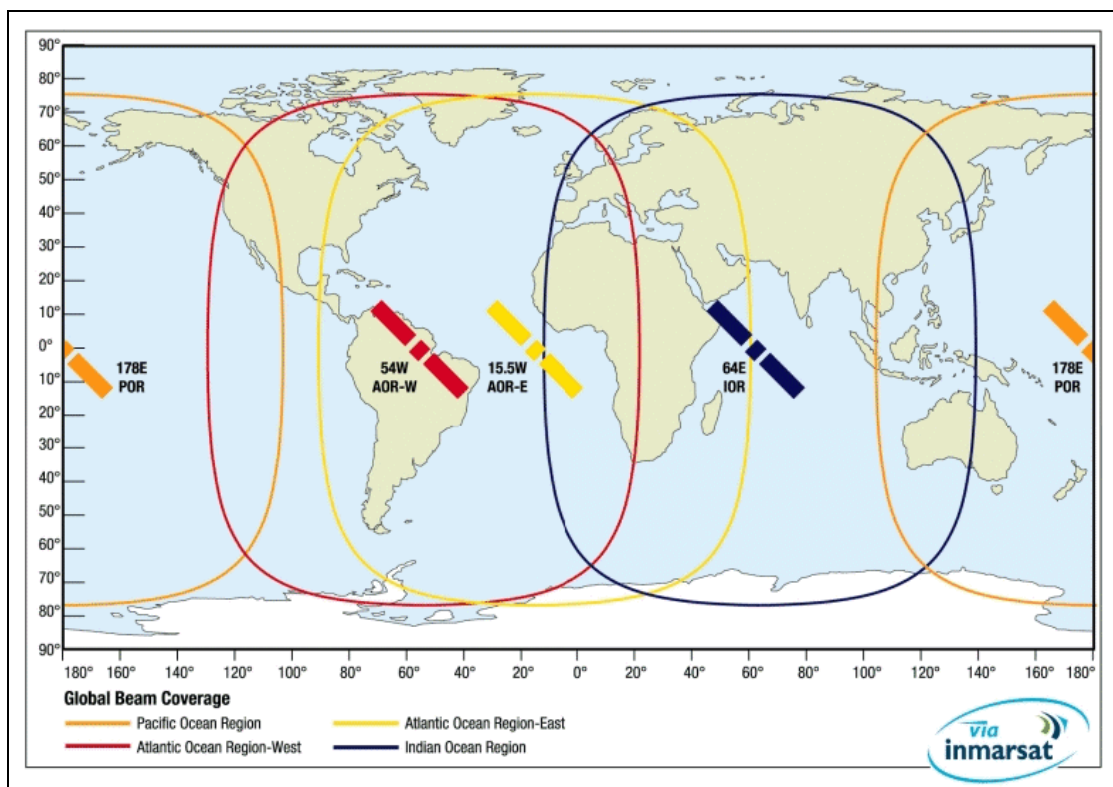


Figure 3-1: Inmarsat Satellite Constellation

## Mounting

**Caution:** The TAM-242 must be mounted so that the key switch and connector side of the TAM-242 is facing in the opposite direction to the direction of travel of the asset being tracked.

The mounting position should take into account the criteria defined in Location on page 6. If the terminal is to be permanently fitted then all four mounting points must be used. The four mounting points are M4 clearance holes on a 230.3mm x 161.3mm rectangle, with the enclosure overhanging these fixings by around 10mm on all sides. Fit the adhesive pads to the face of each magnet to protect against damage to the asset.

**Caution:** Do not over tighten the fixing points, doing so may cause damage to the TAM-242.

## TAM-252 Proximity Switch

The switch and actuator must be mounted as shown below to ensure that the switch is closed. The gap between the switch and actuator must be less than 6mm. The switch will open when the gap is greater than 13mm. Care must be taken during installation to ensure that the switch and actuator are installed in such a way that a separation of 6mm or less is maintained in order to prevent false activation of the switch.

Optional mounting plates have been supplied for the switch and actuator. These can be used to increase the separation between the switch/actuator and the surface they are mounted on. This is useful when they are mounted on ferrous metals since the metal can affect the activation distance between the switch and actuator.

Ensure that the proximity switch is mounted so that the cable is long enough to reach the TAM-242 unit.

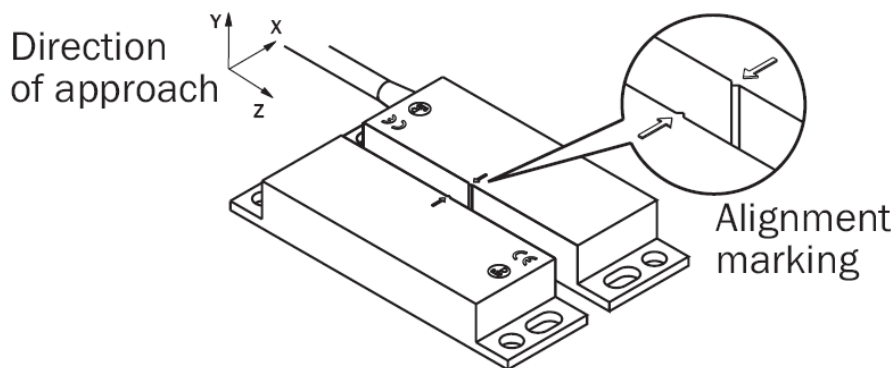


Figure 3-2: Proximity switch mounting

## Key Switch Operation

The key switch is used to turn the TAM-242 on or off for periods when the equipment is not in use and thus preserve battery life.

### *Switching On the Terminal*

Turn the key switch to the on position. When switching the terminal on, the LED will start to flash 1 second on, 2 seconds off until a position report has been sent or it has timed out (up to 10 minutes).



*Figure 3-3: Key Switch On Position*

**Note:** If the LED does not switch on as expected there may be a fault. Please refer to Troubleshooting on page 11 for more information.

### *Switching Off the Terminal*

Turn the key switch to the off position. The LED will switch on for 6 seconds then switch off. The terminal is now in the off state and will not transmit position reports until switched back on.



*Figure 3-4: Key Switch Off Position*

**Note:** If the LED does not switch on as expected there may be a fault. Please refer to Troubleshooting on page 11 for more information.



## Operational Status

The TAM-242 is a self contained unit and as such the only checks that can be made are when charging the battery or changing the unit's state from on to off or vice versa. In all of these cases the LED function is as per the following table:

Operation	LED Status	Duration	Remarks
Normal Operation – Position Reporting and “Awake” to Receive Message	Flashing – Colour indicates charge level	One second on, two seconds off for up to 10 minutes	The colour indicates the charge status, Green >90%, Orange 25% to 90%, Red <25%. Terminal will enter Sleep Mode between transmissions (no LED)
Switch Off with Key Switch	ON	Six seconds	LED will remain off until the terminal is switched on or charged
Switch On with Key Switch	Flashing	One second on, two seconds off for up to 10 minutes	Immediately transmits a position report
Charging	ON – Red or Orange	Continuous	There is a fault
Charging	Flashing - Red	Five seconds on, three seconds off	Battery charge at <90%
Charging	Flashing - Green	Five seconds on, three seconds off	Battery charge at >90%
Charging	ON - Green	Continuous	Battery full



## Troubleshooting

### ***Non Reception of Transmissions***

If the application is not receiving transmissions from the TAM-242, there may be a problem with the system. You should:

- Ensure that the TAM-242 has been activated with a valid airtime package.
- Ensure that the antenna is not blocked and has a clear line of sight to the satellites. Refer to Location on page 6.
- Ensure that the TAM-242 is switched on.
- Ensure that the battery is charged.

### ***LED Always Off***

If the LED does not switch on either during a normal transmission or as part of the sequence for Switching on/off, the battery may be discharged. The LED will indicate the battery charge status whilst the unit is plugged into the charger. If after checking the battery the fault persists you should contact [trackingsupport@msglobaltracking.com](mailto:trackingsupport@msglobaltracking.com) for further help.

### ***LED Continuous Red or Orange***

In the event the LED illuminates red or orange continuously, there is most likely a fault with the unit. Contact [trackingsupport@msglobaltracking.com](mailto:trackingsupport@msglobaltracking.com) for further help.

# Chapter 4 – Maintenance



**CAUTION: THERE IS THE RISK OF EXPLOSION IF THE BATTERY PACK IS REPLACED BY ONE THAT IS NOT SUPPLIED BY EMS GLOBAL TRACKING, OR IF THE BATTERY PACK IS ABUSED OR DISPOSED OF INCORRECTLY. OBSERVE BATTERY SAFETY INFORMATION PRESENT UNDER GENERAL SAFETY WARNINGS ON PAGE iii.**



**WARNING:** The TAM-242 requires no specific maintenance. The device contains static sensitive parts. There are no user-serviceable parts or fuses inside the device. Refer servicing only to qualified service personnel.

**Note:** Prolonged storage of the unit at high temperatures may cause premature ageing of the battery, resulting in a reduced battery capacity. The unit should be stored below 40°C where possible.

Dust and finger marks can be removed using a soft damp cloth. Avoid using domestic cleaning products.

## Charging the Battery

**Caution:** The unit should only be recharged whilst the key switch is in the off position. The unit will not transmit if switched on whilst recharging. Please refer to Switching Off the Terminal on page 9.

**Caution:** Only recharge using the supplied charger.

**Note:** The unit must be fully charged before deployment to enable accurate reporting of the remaining battery charge capacity. Charging time for a discharged unit will typically be 6 to 8 hours.

To recharge the battery connect the unit to the charger. When discharged the charging time will typically be 6 to 8 hours. Whilst the unit is charging the LED will either flash to indicate the battery charge status, or illuminated solid red or orange to indicate a fault. Charge status is indicated as per the following table:

LED Status	Battery Charge Level
Flashing - Red	Low <90%
Flashing - Green	Charged >90%

Please refer to Operational Status on page 10 for more information on the LED functions.

# Appendix A - Specifications

## Physical

Dimensions	247 mm x 178 mm x 48 mm
Weight	1.3kg

## Environmental

Temperature (TAM-242)	-35°C to +55°C
Temperature (TAM-252) <sup>2</sup>	-20°C to +55°C
Charging Temperature	0°C to +45°C
Humidity	≤ 95% @ +40°C, non-condensing

## SAT-200 Modem

Transmit frequency	1626.5 MHz to 1660.5 MHz
Receive frequency	1525.0 MHz to 1559.0 MHz
GPS frequency	1575.42 ± 1.0 MHz
Elevation angle range	0° to 90°
Transmit EIRP	0 - 9dBW
Transmitter modulation	2 level FSK, 256Hz tone spacing
Transmit burst duration	2s or 8s

## Receiver

Receive G/T	≥ -25dB/K at EL = 30°
Receiver modulation	32-ary FSK, 20Hz tone spacing

## GPS

Channels	50	
Time To First Fix (Typical)	Cold start:	29s
	Hot start:	<1s (GPS was off for less than 2 hours)
Accuracy (SA Off)	Position (CEP, 2D):	2.5m (Typical)
Altitude	Maximum	12000m
Dynamic capability	Velocity:	Maximum 310m/s
	Acceleration:	≤ 4g
Maximum update rate	1s	

## Control & Monitoring

Interface	Asynchronous serial RS232
Baud rate	9600 bps
Parity/data bits/stop bits	N,8,1

<sup>2</sup> The TAM-252 temperature specification is limited by the temperature specification of the proximity switch.

## Approvals and Certification



1999/5/EC including 2004/108/EC EMC and 2006/95/EC LVD

Relevant Standards:

EN301 489-20 v1.2.1 (2002-11)

EMC Testing

EN 60950:2000

Electrical Safety (R&TTE)

ETSI EN 301 426 v1.2.1 (2001-10)

Radio Approval

Ingress Protection:

EN60529 :1999 classification IP66

Inmarsat Type Approved (Inmarsat Certificate Number DST005)

The product complies with FCC requirements:

FCC 25.216

FCC 25.202

OET bulletin 65

# Appendix B – Warranty

## Warranty

EMS Global Tracking warrants that the TAM-242 will be free from defects in material and workmanship for a period of one (1) year from date of purchase only if the instructions in this document have been complied with and the installation has been carried out by an authorized person. During the warranty period EMS Global Tracking will, at its option, either repair or replace products that prove to be defective. If a defect exists, at its option, EMS Global Tracking will repair the product at no charge, using new or refurbished replacement parts, or exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product. A replacement product assumes the remaining warranty of the original product or 90 days, whichever is the longer for you. All hardware (or part thereof) that is replaced by EMS Global Tracking shall become the property of EMS Global Tracking upon replacement. EMS Global Tracking does not warrant that the operation of the equipment or firmware will be uninterrupted or error free.

For warranty service or repair the product must be returned to a service facility designated by EMS Global Tracking quoting the information contained in Section 4. Failure to do so could invalidate or delay any warranty repair.

### *Limitation of Warranty*

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the Buyer, Buyer-supplied software (scripts) or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper installation. The warranty shall not apply if batteries other than those supplied by or recommended by EMS Global Tracking are used. The warranty shall not apply if an unauthorized person has installed the system.

**EXCEPT FOR THE ONE (1) YEAR LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED “AS-IS” WITHOUT ANY WARRANTY OF ANY KIND INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IF ANY IMPLIED WARRANTY CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED WARRANTY SHALL BE LIMITED TO NINETY (90) DAYS. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.**

TO THE MAXIMUM EXTENT PERMITTED BY LAW, EMS GLOBAL TRACKING IS NOT LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY LOSS OF USE OF THE PRODUCT, INCONVENIENCE OR DAMAGES OF ANY CHARACTER, WHETHER DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF GOODWILL, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, LOSS OF INFORMATION OR DATA CONTAINED IN, STORED ON, OR INTEGRATED WITH ANY PRODUCT RETURNED TO EMS GLOBAL TRACKING FOR WARRANTY REPAIR) RESULTING FROM THE USE OF THE

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PRODUCT, RELATING TO WARRANTY SERVICE, OR ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY, EVEN IF EMS GLOBAL TRACKING HAS BEEN ADVISED OF THE

**POSSIBILITY OF SUCH DAMAGES. THE SOLE REMEDY FOR A BREACH OF THE FOREGOING LIMITED WARRANTY IS REPAIR OR REPLACEMENT OF THE DEFECTIVE OR NON-CONFORMING PRODUCT.**

### ***Governing Law***

The laws of England and Wales shall govern this one (1) year warranty. Some countries do not allow the exclusion or limitation of incidental or consequential damages or exclusions or limitations on the duration of implied warranties or conditions. The above limitations may not therefore apply to you. This warranty gives you specific legal rights, and you may also have rights that vary by country.

### ***Returns***

If you are advised to return your equipment, you will be provided with a Return Materials Authorization (RMA) number, which must be quoted on all supporting paperwork. You must also include the Inmarsat Serial Number (ISN), part number and product serial number. ***Failure to do so could result in a delay in processing the repair.***

# Appendix C – Declaration of Conformity



Issue 1

## Declaration of Conformity

<b><u>Manufacturer</u></b>	
EMS Global Tracking Ltd. Miller Court, Severn Drive Tewkesbury Business Park Tewkesbury Glos GL20 8DN UK	
<b><u>Product Identification</u></b>	
Product description:	Inmarsat-D (IsatM2M mode) tracking unit incorporating Satamatics SAT-202 Inmarsat Type Approved Mobile Earth Terminal (MET)
Model number:	TAM-242 / TAM-252
The product is in conformity with the following directives ( <i>and associated amending directives</i> ) based on test results using harmonised standards:	
<ul style="list-style-type: none"> <li>• R&amp;TTE Directive 1999/5/EC, including;             <ul style="list-style-type: none"> <li>○ Low Voltage Directive 2006/95/EC</li> <li>○ EMC directive 2004/108/EC</li> </ul> </li> </ul>	
<b><u>Harmonised Standards Used</u></b>	
Radio standards per Article 3.2.:	ETSI EN 301 426 v1.2.1
EMC standards per Article 3.1b):	ETSI EN 301 489-20 v1.2.1 ETSI EN 301 489-1 v1.8.1
Safety standards per Article 3.1a):	EN 60950-1:2006
<b><u>Additional Information</u></b>	
Technical file held by:	EMS Global Tracking Ltd. Miller Court, Severn Drive Tewkesbury Business Park Tewkesbury Glos GL20 8DN UK

We, **EMS Global Tracking Ltd.**, hereby declare under our sole responsibility that the equipment identified above complies with all the essential requirements of the directives.

Signed:  Title: J Hatherall, Director of Engineering , EMS Global Tracking Ltd.

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