



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)  
WORKING GROUP MEETING (DGP-WG/23)**

**Rio de Janeiro, Brazil, 15 to 19 May 2023**

- Agenda Item 1: Harmonizing ICAO dangerous goods provisions with UN Recommendations on the Transport of Dangerous Goods (REC-A-DGS-2025)**  
**1.2: Develop proposals, if necessary, for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2025-2026 Edition**

**EXCEPTION FOR LITHIUM BATTERY POWERED DATA LOGGERS / CARGO TRACKING DEVICES**

(Presented by D. Brennan)

**SUMMARY**

This working paper seeks further consideration on the development of an exception for data loggers and cargo tracking devices powered by lithium cells and batteries when these devices are in use or intended for use.

Action by the DGP-WG is in paragraph 2.

**1. INTRODUCTION**

1.1 At DGP-WG/22, a working paper was presented (see DGP-WG/22 report, paragraph 4.4.2) that sought review by the DGP of the draft provisions that were developed at the twenty-seventh meeting of the Dangerous Goods Panel (DGP/27, Montréal, 16 to 20 September 2019) for an exception from the provisions of the Technical Instructions for lithium battery powered data loggers and cargo tracking devices when these devices are in use or intended for use.

1.2 The original exception developed at DGP/27 was based on a more general exception that had been adopted into the 21<sup>st</sup> revised edition of the UN Model Regulations. The objective of the exception was to permit data loggers and cargo tracking devices in or attached to packages or overpacks with consignments of pharmaceuticals, valuables or other cargo without the need for the lithium battery mark on the packages and the compliance statement on the air waybill.

1.3 DGP-WG/22 supported moving forward with developing provisions for exceptions from the Technical Instructions as well as the development of some guidance material that could include

information on operator approval to address potential electromagnetic interference with aircraft systems. The first step was for panel members to reach out to their contacts to provide information to the author on the size of lithium cells and batteries, in terms of lithium metal content or Watt-hour rating, in active devices currently in use.

1.4 Following DGP-WG/22, a list of 114 data loggers / cargo trackers was assembled based on the information provided by a number of panel members. This list shows by manufacturer identifying the model number, power source (lithium metal, lithium ion or other), cell or battery, lithium metal content / Watt-hour rating, function (logger or tracker), the presence of a transmitting function and for some devices the certification or other relevant information. This information is available in Appendix C to this working paper.

1.5 The list shows that the vast majority of devices powered by lithium metal cells or batteries use only button cells and with few exceptions that the cells or batteries have a lithium metal content not exceeding 1 g or 2 g respectively. Most of these devices were data loggers rather than tracking devices.

1.6 For devices powered by lithium ion cells or batteries, the results were not so clear cut with a range of Watt-hour ratings apparent, but the majority have a lithium cell or battery of less than 20 Wh. Devices powered by lithium ion cells or batteries were largely GPS trackers with GSM capabilities.

1.7 Based on this, it appears that a limit of 1 g for lithium metal cells, 2 g for lithium metal batteries and 20 Wh for devices powered by lithium ion cells or batteries may be appropriate in that it would address all but a small number of devices currently in use, or at least the majority of those identified in the survey.

1.8 Also Appendix B to this working paper is a standard operating procedure (SOP) for the handling of active devices used in cargo developed by the International Air Transport Association (IATA) Interactive Cargo Team. This SOP sets out the recommendations on the processes to be followed for the operator approval of active devices, the declaration by the shipper / freight forwarder at the time of booking of the cargo containing active devices and then acceptance by operator when the cargo containing active devices is tendered for air transport.

## 2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to review the provisions as shown in the Appendix A to this working paper to consider the limits shown in square brackets for lithium metal and lithium ion batteries. The DGP-WG is invited to consider if the limits proposed are appropriate.

2.2 The DGP-WG is also invited to consider the need for guidance to address the potential for interference with aircraft systems. As an indication, this guidance could propose that:

a) the device manufacturers be required to certify that:

- 1) the device meets the radio frequency radiated emissions limits in RTCA DO-160, Environmental Conditions and Test Procedures for Airborne Equipment, Section 21, Category H; or

- 2) the device uses low-powered wireless with a maximum of 100mW EIRP (equivalent isotropic radiated power). Bluetooth meets this limit.
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- b) Operators can approve the use of certified devices where the aircraft manufacturer has advised that the aircraft are designed and certified as being portable electronic equipment (PED) tolerant. Where the aircraft is not PED tolerant, the operator would be required to test the aircraft in accordance with RTCA DO-307A, Aircraft Design and Certification for Portable Electronic Device (PED) Tolerance, as an acceptable method for demonstrating aircraft tolerance to intentional transmissions and spurious emissions from PEDs.

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## APPENDIX A

### PROPOSED AMENDMENT TO PART 1 OF THE TECHNICAL INSTRUCTIONS

#### Part 1

#### GENERAL

#### Chapter 1

#### SCOPE AND APPLICABILITY

##### 1.1 GENERAL APPLICABILITY

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##### 1.1.5 General exceptions

1.1.5.1 Except for 7;4.2, these Instructions do not apply to dangerous goods carried by an aircraft where the dangerous goods are:

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h) contained within items of excess baggage being sent as cargo provided that:

- 1) the excess baggage has been consigned as cargo by or on behalf of a passenger;
- 2) the dangerous goods may only be those that are permitted by and in accordance with 8;1.1.2 to be carried in checked baggage;
- 3) the excess baggage is marked with the words "Excess baggage consigned as cargo".

i) data loggers and cargo tracking devices with installed lithium batteries, attached to or placed in packages, overpacks or unit load devices are not subject to any provisions of these Instructions provided the following conditions are met:

- 1) the data loggers or cargo tracking devices must be in use or intended for use during transport;
- 2) each cell or battery must meet the provisions of Part 2;9.3 a), e), f) (if applicable) and g);
- 3) for a lithium ion cell, the Watt-hour rating not exceeding [20 Wh];
- 4) for a lithium ion battery, the Watt-hour rating not exceeding [20 Wh];
- 5) for a lithium metal cell, the lithium content not exceeding [1 g];
- 6) for a lithium metal battery, the aggregate lithium content not exceeding [2 g];
- 7) the number of data loggers or cargo tracking devices in or on any package or overpack must be no more than the number required to track or to collect data for the specific consignment;
- 8) the data loggers or cargo tracking devices must be capable of withstanding the shocks and loadings normally encountered during transport;
- 9) the devices must not be capable of generating a dangerous evolution of heat; and

10) the devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems.

*Note.— This exception does not apply where the data loggers or cargo tracking devices are offered for transport as a consignment in accordance with Packing Instruction 967 or 970.*

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**APPENDIX B**

**STANDARD OPERATING PROCEDURE (SOP) FOR THE HANDLING OF ACTIVE DEVICES  
USED IN CARGO DEVELOPED BY THE IATA INTERACTIVE CARGO TEAM**





# Interactive Cargo

Standard  
Operating  
Procedures  
IoT device  
handling



# Introduction to the SOP

Shippers, cargo handlers and stakeholders of the air cargo supply chain wish to know with confidence the procedures and requirements for the approval and use of tracking devices and data loggers used to locate, track, monitor, or alert on transportation conditions.

This Standard Operating Procedures (SOP) document contains the operational steps that stakeholders of the air cargo supply chain should follow when using tracking devices or data loggers for the purpose of registering data of the status of the shipment and when handling cargo that includes tracking devices and data loggers.

These procedures are not location specific. In addition to following these generic procedures, stakeholders will also have to comply with any rule that may have been defined in relation to cargo tracking devices. It is important to note that stakeholders may feel that they need to adjust their procedures not only based on specific location rules, but also based on their internal procedures and systems or to comply with any local practice or agreement they may have with their partners, suppliers and customers.



# SOP scope and framework

The scope of this Standard Operating Procedure is to outline the activities and responsibilities of the stakeholders of the air cargo industry related to the handling of tracking devices and data loggers used in air cargo.

The Standard Operating Procedure IoT device handling is based on the following documents, that provide the framework:

- [Industry Master Operating Plan \(MOP\)](#)
- IATA Cargo Handling Manual (ICHM)
- Recommended Practice 1693 Device Approval for Air Cargo

# Definitions

- **Portable electronic device (PED)** means any kind of electronic device, typically but not limited to consumer electronics, brought on board the aircraft by crew members, passengers, or as part of the cargo, that is not included in the configuration of the certified aircraft. It includes all equipment that consume electrical energy. The electrical energy can be provided from internal sources such as batteries (chargeable or non-rechargeable) or the devices may also be connected to specific aircraft power sources.
- **Cargo tracking device/data logger** means a PED attached to or included in airfreight (e.g., in or on containers, pallets, parcels, mail bags, and baggage), with the purpose of monitoring parameters such as location, temperature, humidity, vibrations, etc. The cargo tracking device may transmit these parameters remotely by means of radio frequency (RF) emissions.

*NOTE: Please refer to Recommended Practice 1693 Device Approval for Air Cargo for details.*



# Device approval by airline

## Why a device approval is necessary?

- Portable Electronic Devices (PEDs) in cargo may interfere with aircraft avionics and electrical systems.
- As per EASA ("AMC1 CAT.GEN.MPA.140," 2019) and FAA (*AC 91.21-1D*, 2017), it is the operator's responsibility to authorize the use of PEDs onboard an aircraft, in compliance with the Air Operator Certificate (AOC).
- It is recognized that the final decision regarding the approval of the device is up to the operator and the approval process must comply with all applicable international/national regulations.
- Using unauthorized/undeclared cargo tracking devices may result in cargo hold, delay or return, and increase the safety risks associated with lithium batteries and electromagnetic interferences onboard aircraft.
- Most of these devices use lithium metal or lithium-ion cells or batteries as a power source. Lithium cells and batteries are classified as dangerous goods and therefore must meet all the applicable provisions of the IATA Dangerous Goods Regulations (DGR) when shipped by air. This applies regardless of whether the lithium cells or batteries are shipped as cargo by themselves or whether the lithium cells or batteries are installed in a small device such as a data logger that is placed inside or attached to packages of cargo. In addition, to be permitted in transport all lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria. Please refer to the [2021 Guidance Document – Battery Powered Cargo Tracking Devices / Data Loggers](#)

*NOTE: Please refer to Recommended Practice 1693 Device Approval for Air Cargo for details.*





# Device approval by airline

## Recommended Practice 1693 Device Approval for Air Cargo

IATA has published the Recommended Practice on Device Approval for Air Cargo (RP 1693) to provide guidelines for the approval process of tracking devices and data loggers (referred to as PED in the RP1693) used for the purposes of air cargo.

### Structure of RP 1693

1. The RP1693 defines the relevant terms related to the approval.
2. The RP describes the two aspects of evaluation of PED:
  - a) Electromagnetic compatibility (EMC) with the aircraft
  - b) The battery contained in the PED
3. The RP explains the approval request process

*NOTE: Please refer to Recommended Practice 1693 Device Approval for Air Cargo for details.*



# Device approval by airline

## Approval request process

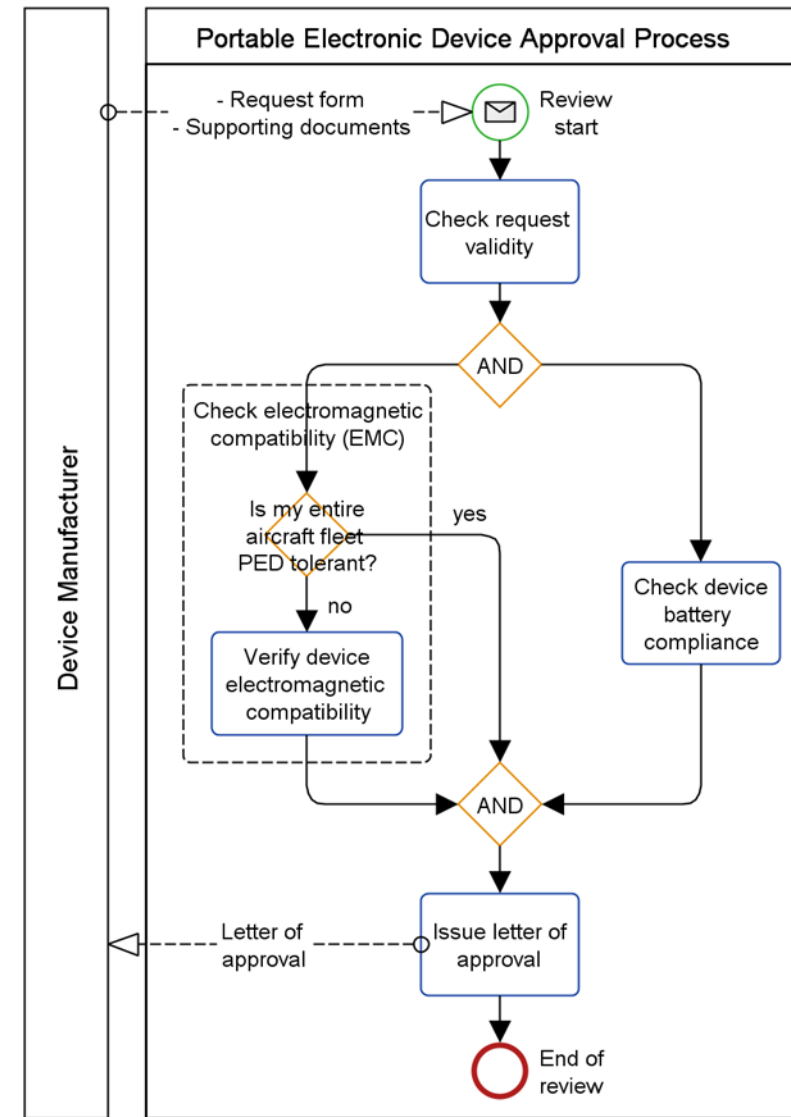
The RP1693 includes an Approval Request Form for the Use of Portable Electronic Device Onboard Aircraft for Air Cargo.

This form, accompanied by all supporting documents listed, is intended for use by device manufacturers in order to submit approval requests to airlines.

Airline evaluation is based on the submitted documents and verification of compliance on the two aspects of evaluation.

Based on the evaluation, an airline has the right to either approval or reject the use of PED.

In case of approval, a Letter of Approval is issued by the airline.



*NOTE: Please refer to Recommended Practice 1693 Device Approval for Air Cargo for details.*



# Device declaration at booking

- Using unauthorized cargo tracking devices may result in cargo hold, delay or return, and increase the safety risks associated with lithium batteries and electromagnetic interferences onboard aircraft.
- Information on authorized cargo tracking devices is available at the airlines and at the device manufacturers. Verifying that the tracking device/data logger included in/attached to the shipment is approved by the airline is essential when planning and booking shipment. It is the responsibility of the carrier to confirm devices are approved. In case interlining is included, all involved carriers must confirm devices are authorized.
- Sharing information and communicating accurately between Shippers and Airlines is a must and the role of the Freight Forwarding companies is key, as in most cases the shippers do not have direct communication with airlines. Accurate information on the devices can ease the process of monitoring important aspects of the shipment and being able to detect any potential deviation of the circumstances required to ensure shipment condition and timely arrival at destination.
- The following steps of MOP are affected by Interactive Cargo related activities
  - 1.1 Receive Shippers' Request & Check Security Status
  - 1.2 Receive Shipper Freight Information
  - 1.4 Request Capacity Against Forwarder or Carrier Inventories - Cargo Reservations – Contents of Information
  - 1.5 Confirm Capacity
  - 5.4 Create Shipment Record & Consolidation Manifest -Completion of the Electronic Air Waybill
  - 6.3 Transmit Forwarder Information to Carrier
  - 8.3 Validate information against the booking and update

*NOTE: Please refer to the IATA Cargo Handling Manual for additional information. Please read section 1.1, 1.2, 1.4, 1.5, 5.4 and 6.3.*





# Shipment acceptance at carrier's facility

At shipment acceptance, carrier/GHA shall perform a validation of tracking devices/data loggers.

This verification shall be a document check against booking, not a physical verification, and shall consist of the following elements.

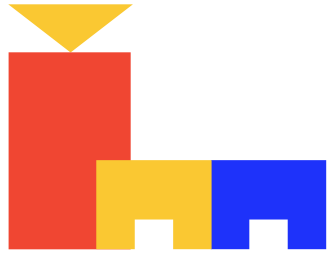
1. Verification of presence of the Electronic Monitoring Device (EMD) code under Handling information,
2. Verification of the device model and confirmation against the list of approved devices by the carrier.

There is no generic process for determining the maximum number of tracking devices/data loggers present on the aircraft at the same time.

Airlines may decide to limit the number of tracking devices/data loggers that can be loaded on the same aircraft, based on their internal risk assessment.



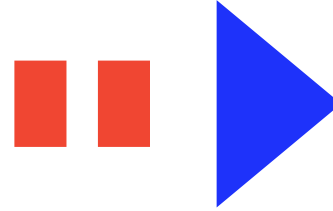
# Responsibilities



**SHIPPER**

## Booking

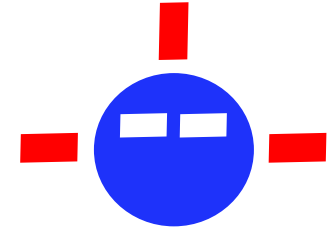
- Request approval from the carrier on the device used following the IATA RP1693 on Device Approval for Air Cargo
- Include information on the used tracking devices within the Shipment Information, mentioning in which box or pallet the tracking device is inserted, specifying the serial number of each tracking device. Each tracking device must be linked to the box or pallet where is located.



**FORWARDER**

## Booking

- Freight Forwarder must include the type/model/serial number of the device in their flight booking with carrier and the same information declared in the AWB under Handling Information or in the specific field in the FWB.



**CARRIER**

## Booking

- Confirm that devices included in the shipment are approved.
- Booking with Special Handling Code (EMD) based on approved device to be sent to GHA.

## Shipment acceptance

- Verification of presence of the Electronic Monitoring Device (EMD) code under Handling information.
- Verification of presence of information on device model and confirmation against the list of approved devices by the carrier.



*NOTE: Please refer to the IATA Cargo Handling Manual for additional information. Please read section 1.1, 1.2, 1.4, 1.5, 5.4, 6.3 and 8.3.*

**APPENDIX C**

**DATA LOGGERS / CARGO TRAKERS BY MANUFACTURER IDENTIFYING THE MODEL NUMBER, POWER SOURCE (LITHIUM METAL, LITHIUM ION OR OTHER), CELL OR BATTERY, LITHIUM METAL CONTENT / WATT-HOUR RATING, FUNCTION (LOGGER OR TRACKER), THE PRESENCE OF A TRANSMITTING FUNCTION AND FOR SOME DEVICES THE CERTIFICATION OR OTHER RELEVANT INFORMATION**



Details of the Data Loggers / Cargo Tracking Devices									
Brand Name	Model No.	Power Source	Cell / Battery	Lithium Metal Content (g)	Watt-hour Rating (Wh)	Function (tracker / logger)	Transmitting Function	Certification	Other
7P Solutions	7PGL300series	Lithium ion	Cell		9.62 Wh	GPS tracker	GSM/GPRS/EDGE		
7P Solutions	7PGL300series Extended battery	Lithium ion	Battery		11.84 Wh	GPS tracker	GSM/GPRS/EDGE		
7P Solutions	7PGD100	Lithium metal	Battery	1.68 g		GPS tracker	GSM/GPRS/EDGE		3 cell battery
Be On	A1	Lithium metal	Cell	< 1 g		GPS tracker			
Berlinger	Q-Tag CLm Doc D	Lithium metal	button cell	0.16 g		Data logger	None		
Berlinger	Q-Tag CLm Doc	Lithium metal	button cell	0.16 g		Data logger	None		
Berlinger	Q-Tag CLm Doc L	Lithium metal	button cell	0.16 g		Data logger	None		
Berlinger	Q-Tag CLm Doc LR	Lithium metal	button cell	0.16 g		Data logger	None		
Butterfly	i-TraQ	Lithium ion	Battery		9 Wh	GPS tracker			
CalAmp	Model # SC iOn Tag	Lithium metal	button cell	0.041 g			Bluetooth		
CalAmp	Model # SC1004	Lithium ion	Battery		14.8 Wh	GPS tracker	GSM/GPRS/EDGE		
CalAmp	Model # SC1102	Other							
CalAmp	Model # SC1204	Lithium ion	Battery		14.8 Wh	GPS tracker	GSM/GPRS/EDGE		
Cartasense		Lithium metal	button cell	0.18 g					
Controlant	CO 10.1	Lithium ion	Cell		6.7 Wh	GPS tracker	GSM/GPRS/EDGE	FC Part 15, Subparts A and B. CE EMC directives (EN 50081-1:1992 and EN 61000-61:2001). RTCA DO-160	
ELPRO	Libero CB	Lithium metal	button cell	pending			None	CE   EN12830   EMC   RTCA DO-160   RoHS   WHO-PQS	
ELPRO	Libero CS	Lithium metal	button cell	pending			None	CE   EN12830   EMC   RTCA DO-160   RoHS   WHO-PQS	
ELPRO	Libero CE	Lithium metal	button cell	pending			None	CE   EN12830   EMC   RTCA DO-160   RoHS   WHO-PQS	
ELPRO	Libero ITS	Lithium metal	button cell	pending			None		
Emerson	Go BT Logger	Lithium metal	button cell	0.18 g		BLE tracker			
Emerson	Go Realtime Standard	Lithium ion	Battery		19.98 Wh				
Emerson	Go Realtime XL	Lithium ion	Battery		19.98 Wh				
Emerson	Go Realtime Lux	Lithium ion	Battery		19.98 Wh				
Escavox	gSense30g-02	Lithium ion	Battery		12.95	GPS tracker			
Inno Track	Frigga B9 2G/3G	Lithium ion	Battery		10.73 Wh	GPS tracker			
Kelvin	V7	Lithium ion	Battery		11.1 Wh	GPS tracker			
<b>Kirsens Technologies</b>	<b>DB Schenker Smartbox A-type</b>	<b>Lithium ion</b>	<b>Battery</b>		<b>34.56 Wh</b>	<b>GPS tracker</b>			
Libero	CE, CL, CH	Lithium metal	button cell	< 1 g		BLE tracker			
Logmore	Model One	Lithium metal	button cell	0.05 g		Data logger			
Logmore	Model Two	Lithium metal	button cell	0.05 g		Data logger			
Logmore	Model Three	Lithium metal	button cell	0.05 g		Data logger			
Madgetech	Cyro-Temp	Lithium metal	Cell	0.3 g					
Madgetech	Micro-Temp	Lithium metal	Cell	0.3 g					
Madgetech	PRHTemp 101	Lithium metal	Cell	0.3 g					
Madgetech	PRHTemp 110	Lithium metal	Cell	0.3 g					
Madgetech	PRTemp101	Lithium metal	Cell	0.3 g					
Madgetech	RHTemp 1000IS	Lithium metal	Cell	0.3 g			None		
Madgetech	RHTemp 101	Lithium metal	Cell	0.3 g					
Madgetech	RHTemp 110	Lithium metal	Cell	0.3 g					
Madgetech	Temp100	Lithium metal	Cell	0.3 g					
Madgetech	Temp 1000IS	Lithium metal	Cell	0.3 g			None		
Madgetech	Temp110	Lithium metal	Cell	0.3 g					
Madgetech	TransiTempII RH	Lithium metal	Cell	0.3 g					

Brand Name	Model No.	Power Source	Cell / Battery	Lithium Metal Content (g)	Watt-hour Rating (Wh)	Function (tracker / logger)	Transmitting Function	Certification	Other
Madgetech	TC 4000-MP	Lithium metal	Cell	0.3 g					
Madgetech	RTDTemp 101	Lithium metal	Cell	0.3 g					
Madgetech	Temp Retriever RH	Lithium metal	Cell	0.3 g					
Moog-Crossbow	ILC2000	Lithium ion	Battery		6.66 Wh	GPS tracker			
Next4	N402, N402i	Lithium metal	Cell	< 1 g		GPS tracker			
OnAsset	Sentry Flightsafe 500	Lithium ion	Cell		19.3 Wh	GPS tracker	GSM/GPRS/EDGE		Also shown by QF as 28 wh
OnAsset	Sentry Flightsafe 600	Lithium ion	Cell		19.98 Wh	GPS tracker	GSM/GPRS/EDGE		
OnAsset	Sentinel 100	Lithium metal	Battery	0.48 g		BLE tracker	Bluetooth		
OnSet	InTemp CX500 Series Temperature Logger: CX501	Lithium metal	button cell	0.07 g			Bluetooth		
OnSet	InTemp CX500 Series Temperature Logger: CX502	Lithium metal	button cell	0.18 g			Bluetooth		
OnSet	InTemp CX500 Series Temperature Logger: CX503	Lithium metal	button cell	0.18 g			Bluetooth		
roambee	<b>RMBU-3GTR (Bee Sense, Bee, 3G Bee and Sensor Bee)</b>	Lithium ion	Battery		34.41 Wh	GPS tracker	GSM/GPRS/EDGE		Device has option for 51 Wh battery
roambee	Sensor BeeBeacon MODEL #BB-SEC-1	Lithium metal	button cell	0.07 g		BLE tracker			
roambee	BB-TPH-1	Other				BLE tracker			Alkaline battery
roambee	Flex	Other				GPS tracker			NiMh cell
SC ion Trak	SC-1204	Lithium ion	Battery		14.8 Wh	GPS tracker			
SC ion Trak	SC-1302	Other				GPS tracker			Alkaline
Scout	DOS-V2	Lithium ion	Battery		14.4 Wh	GPS tracker			
Sendum	PT300 / PT300D	Lithium ion	Battery		13.9 Wh	GPS tracker			
SenseAware	SenseAware 3000	Lithium ion	Battery		11.1 Wh	GPS tracker	GSM/GPRS/EDGE	FAA Advisory Circular No: 91-21.1C, FCC ID, CE mark, PTCRB, RTCA DO-160F	
Sensitech	TempTale Ultra Fit	Lithium metal	button cell	0.17		Data logger	None		All products have been rigorously tested to shipping standards for shock and vibration. oMIL-STD 810D. oASTM D999 Standard Test Methods for Vibration Testing of Shipping Containers. o ASTM D4169-09: Standard Practice for Performance Testing of Shipping Containers and Systems, Category: Small Shipping Unit Assurance Level II. oIEC 60529 Degrees of protection provided by enclosures. oDrop test: 6 axis and all corners, faces and edges. Devices are compliant with applicable radio emissions and compatibility regulations. oUnited States FCC and Industry Canada Intentional Radiator Radiated Emissions. oEuropean Union Radio Equipment Directive. oAnd more.
Sensitech	TempTale Ultra (16k)	Lithium metal	button cell	0.17		Data logger	None		
Sensitech	TempTale Ultra BLE	Lithium metal	button cell	0.17		Data logger	None		
Sensitech	TempTale Ultra (64k)	Lithium metal	button cell	0.18		Data logger	None		
Sensitech	TempTale Direct	Lithium metal	button cell	0.062 g		Data logger	None		
Sensitech	TempTale Ultra BIO	Lithium metal	button cell	0.17 g		Data logger	None		
Sensitech	TempTale Ultra Dry ice probe	Lithium metal	button cell	0.17 g		Data logger	None		
Sensitech	TempTale Ultra Probe	Lithium metal	button cell	0.17 g		Data logger	None		
Sensitech	TempTale Ultra Humidity	Lithium metal	button cell	0.18 g		Data logger	None		
Sensitech	TempTale Ultra Probeless Dry Ice	Lithium metal	button cell	2 x 0.18 g		Data logger	None		
Sensitech	TempTale4	Lithium metal	button cell	0.062 g		Data logger	None		
Sensitech	TempTale4 Multi Alarm	Lithium metal	button cell	0.3 g		Data logger	None		
Sensitech	TempTale RF	Lithium metal	Cell	0.5 g		Data logger	None		
Sensitech	TempTale USB	Lithium metal	Cell	0.3 g		Data logger	None		
<b>Sensitech</b>	<b>TempTale4 Probeless Dry Ice</b>	<b>Lithium metal</b>	<b>Cell</b>	<b>1.32 g</b>		<b>Data logger</b>	<b>None</b>		
<b>Sensitech</b>	<b>TempTale GEO Eagle</b>	<b>Lithium metal</b>	<b>Battery</b>	<b>1.8 g</b>		<b>GPS tracker</b>	<b>GSM/GPRS/EDGE</b>	FCC; CE; NOVI; Anatei; PTCRB; RoHS; WEEE; IEC standard EN61000-4-2 Level 4, EN61000-6-3: 2007+A1: 2011; EN61000-6-1 2007+A1:2007; RTCA/DO-160: Section 20 – RF Susceptibility (Radiated) – Category S and Section 21 – Emissions of RF (Radiated) – Category M and H.	

Brand Name	Model No.	Power Source	Cell / Battery	Lithium Metal Content (g)	Watt-hour Rating (Wh)	Function (tracker / logger)	Transmitting Function	Certification	Other
Sensitech	TempTale GEO LTE Extended	Lithium metal	Battery	2.7 g		GPS tracker	GSM/GPRS/EDGE	FCC, CE, NOMI, Anatel, PTCRB, RoHS, WEEE, IEC standard EN61000-4-2 Level 4, EN61000-6-3: 2007+A1: 2011; EN61000-6-1 2007+A1:2007; RTCA/DO-160: Section 20 – RF Susceptibility (Radiated) – Category S and Section 21 – Emissions of RF (Radiated) – Category M and H.	
Sensitech	TempTale GEO Eagle Extended	Lithium metal	Battery	3.6 g		GPS tracker	GSM/GPRS/EDGE	FCC, CE, RoHS, PTCRB, WEEE, DO160G, EN61000-4-2 Level 4, IEC62133, UN-38.3, EN61000-6-3, EN61000-6-1, EN60950-1; Incidental food contact per U.S. FDA 21 CFR Part 181.32	
Sensitech	TempTale GEO Eagle 3G	Lithium metal	Battery	3.6 g		GPS tracker	GSM/GPRS/EDGE	FCC, CE, RoHS, PTCRB, WEEE, DO160G, EN61000-4-2 Level 4, IEC62133, UN-38.3, EN61000-6-3, EN61000-6-1, EN60950-1; Incidental food contact per U.S. FDA 21 CFR Part 181.33	
Sensitech	Sentry 500	Lithium ion	Cell		19.3 Wh	GPS tracker	GSM/GPRS/EDGE	FAA Compliant; FCC Compliant; CSA C22.2 No. 60950-1-07 Compliant; RTCA DO-160G Subchapter 21 (P, H, M, Q) Compliant; RoHS Compliant; CE Compliant; RTTE Compliant; PTCRB Approved; UL Listed	
Sensitech	Sentry 500 Air Cargo Tracker	Lithium ion	Battery		38.6 Wh	GPS tracker	GSM/GPRS/EDGE	<b>FAA Compliant; FCC Compliant; CSA C22.2 No. 60950-1-07 Compliant; RTCA DO-160G Subchapter 21 (P, H, M, Q) Compliant; RoHS Compliant; CE Compliant; RTTE Compliant; PTCRB Approved; UL Listed</b>	
Sensitech	ILC2000 FlightSmart Air Cargo Tracker	Lithium ion	Battery		6.96 Wh		GSM/GPRS/EDGE		
Sensitech	VizComm™ Prime	Lithium ion	Battery		38.48 Wh		GSM/GPRS/EDGE	<b>FCC; CE; RoHS; PTCRB; RTCA/DO-160G; EN61000-6-3:2007+A1:2011; EN61000-6-1:2007+A1:2007; EN60950-1 2nd Ed.; IEC62133; UN-38.3; GHOST</b>	
Sensitech	VizComm™ Prime Extended	Lithium ion	Battery		79.96 Wh		GSM/GPRS/EDGE	FCC; CE; RoHS; PTCRB; RTCA/DO-160G; EN61000-6-3:2007+A1:2011; EN61000-6-1:2007+A1:2007; EN60950-1 2nd Ed.; IEC62133; UN-38.3; GHOST	
SkyCell	CartaSen U-Sensor	Lithium metal	button cell	0.18 g					
SkyCell	Secure Live MR	Lithium metal	button cell	0.29 g		GPS tracker			
Sony	Visilion-Mobiam	Lithium ion	Battery		11.1 Wh	GPS tracker			
Sony	VT-G100	Lithium ion	Battery		17 Wh	GPS tracker			
System Loco	E4BL, E4B, E4P, P4B, P4P	Lithium metal	button cell	0.18 g		BLE tracker			
System Loco	Loco Track HGD4	Other				GPS tracker			Alkaline
System Loco	Loco Track HGR4	Lithium ion	Battery		14.8 Wh	GPS tracker			
Tec4med	Cryobeacon	Lithium ion	Cell		3.0 Wh	Data logger			
Tec4med	SmartBeacon	Lithium ion	Cell		3.0 Wh	Data logger			
Tec4med	SmartTag S	Lithium metal	button cell	0.006 g		Tracker			
Tec4med	SmartTag M	Lithium ion				Tracker			
tive	TT-4000	Lithium ion	Battery		11.1 Wh	GPS tracker			
tive	TT-6000	Lithium metal	button cell	0.3 g		BLE tracker			
tive	TT-7000	Lithium ion	Battery		9.62 Wh	GPS tracker			
tive	TT-7100	Other				GPS tracker		NiMh cell	
tive	TT-7700	Other				GPS tracker		NiMh cell	
Toolive	TL001	Lithium metal	Cell	< 1 g		GPS tracker			
Tridentify	QTA Tracer Version 1.0 & 2.0	Lithium metal	button cell	0.29 g		BLE tracker			
TSS	Weblogger II Dry Ice	Lithium metal	button cell	0.21 g					
TSS	Weblogger II	Lithium metal	button cell	0.07 g					
TSS	Temp Tracer	Lithium metal	button cell	0.01 g					
Verigo Pod	PAO - Environmental Data Sensor	Lithium metal	button cell	0.15 g					

Brand Name	Model No.	Power Source	Cell / Battery	Lithium Metal Content (g)	Watt-hour Rating (Wh)	Function (tracker / logger)	Transmitting Function	Certification	Other
Verigo Pod	PBO - Environmental Data Sensor	Lithium metal	button cell	0.15 g					
Verigo Pod	Pod Probe	Lithium metal	button cell	0.15 g					
Verigo Pod	Pod One-90	Lithium metal	button cell	0.15 g					
Versa	1	Lithium ion	Battery		6.66 Wh	GPS tracker			
Zimgeneers	G013A	Lithium ion	Battery		11.2 Wh	GPS tracker			