

## 1. BATTERY POWERED GPS ASSET TRACKING ON SIGFOX

The Oyster is a compact, rugged GPS tracking device that has been designed for tracking containers, trailers, skip bins, and other assets where super-long battery life is required without sacrificing the frequency of updates and performance.

The IP-67 rated housing is rugged and UV stable, so the Oyster can be mounted on assets that are exposed to rain, dust and marine conditions.

By utilising the latest technology, the Oyster can operate in ultra-low power modes, and with an incredible battery life of up to 7 years the Oyster can be attached to assets and tracked without needing to change batteries. The Oyster has built-in antennas for GPS reception and for Sigfox communication, a 3D accelerometer, a high-performance GPS that can track both GPS and GLONASS satellites simultaneously and flash memory for storing non-volatile information.

The Oyster Sigfox uses the Sigfox network to give you coverage of your assets at a low data cost. The Oyster Sigfox is available for RCZ1 (Europe and Middle East), RCZ2 (North America and Brazil) and RCZ4 (Australia, New Zealand, South America, Hong Kong, South East Asia).

The option of using extended temperature range AA batteries allows the Oyster to be used in extreme climates that other tracking devices simply cannot operate in.



### 1.1. Hardware Features

#### Hardware Features

##### Low-profile IP67 rugged housing

The IP67 rated housing is made of sturdy ABS/Polycarbonate plastic to survive bumps and knocks and to survive many years in the sun and weather.

It is low-profile making it easier to mount in the corrugation on containers or concealed on the underside of a trailer, for example.

	<p>The housing screws together for easy assembly, and has 2 convenient mounting tabs. It also has 'strap slots' allowing the Oyster to be cable tied or metal strapped to an asset.</p> <p>Dimensions: 100 mm x 65 mm x 19 mm Weight: 160 grams with batteries</p>
<b>Batteries</b>	<p><b>AA size</b>                      The Oyster uses standard "AA" size batteries which provide a balance between size and capacity</p>
	<p><b>Alkaline</b>                        Low cost off-the-shelf alkaline batteries can be used in the Oyster</p>
	<p><b>Off-the-shelf Lithium</b>            For applications that require extreme temperature or extra long-life we recommend that off-the-shelf 1.5V lithium batteries are used. These are readily available from retail outlets, for example Duracell and Energizer</p>
	<p><b>Sleep Current</b>                10uA (micro amps)</p>
<b>Battery Life with Adaptive-Tracking</b>	<p>The Oyster can be set to use Adaptive-Tracking technology where the accelerometer and GPS data are used to intelligently work out if it is moving and to send frequent updates, and to scale the update rate down to once per day if the asset is stationary - to preserve battery life.</p> <p>7 years @ one position per day</p>
<b>Operating Temperature</b>	<p>-20°C to +65°C <sup>1</sup></p> <p>For operation in extreme temperatures, the Oyster must be fitted with lithium batteries.</p>
<b>High sensitivity GPS</b>	<p>UBLOX MAX-M8Q GPS module</p> <p>Supports concurrent GPS and GLONASS</p> <p>72 channel high sensitivity receiver</p> <p>-167dBm industry leading tracking performance</p> <p>Optimal hot-start performance</p> <p>AssistNow Autonomous Offline aiding data for fast time-to-first-fix and performance in urban canyon environments</p>
<b>GLONASS</b>	<p>The Oyster uses both the GPS and GLONASS positioning systems simultaneously.</p> <p>This allows the device to use <b>twice the number of satellites</b> to get a position fix – making it faster and more accurate.</p>
<b>Low noise GPS amplifier</b>	<p>GPS signals are boosted by a special low-noise amplifier (LNA)</p> <p>This allows the Oyster to operate where normal units will fail to receive GPS signal – like in a container stack!</p>
<b>Sigfox Communications</b>	<p>The Oyster uses a high power radio transmitter / receiver that operates on the Sigfox network, and is available in variants for the various Sigfox Zones around the world.</p> <p>RCZ1    Europe and Middle East</p> <p>RCZ2    North America and Brazil</p>

	RCZ4 Australia, New Zealand, South America, Hong Kong, South East Asia
<b>Certifications</b>	In progress
<b>Internal Antennas</b>	Internal GPS and Sigfox antennas tuned by the RF laboratories to ensure optimal performance
<b>3 axis accelerometer</b>	The 3-axis accelerometer allows the Oyster to 'sleep' in an ultra-low power state yet still wakeup when movement occurs. Future firmware versions will allow for harsh G-force detection (like objects being dropped)
<b>Flash memory</b>	The flash memory is used to data, parameters and other important information that needs to be securely stored. A future firmware version will allow for geo-fences to be loaded into the flash memory of the device and used for geo-fence alerting on the device.
<b>Configuration Cable</b>	The Oyster Sigfox caters for a USB configuration adapter and cable, which is used to program firmware updates and configuration information on the device.



## 1.2. Firmware Features

Firmware Smarts	
<b>Sigfox Data Management</b>	The Oyster Sigfox device manages the data plan that is configured for to maximize the use of the allocated Sigfox data messages
<b>OTA Configuration</b>	The Oyster can be remotely configured and some of the key operational parameters updated via the Sigfox downlink messages (your data plan needs to support downlink messages).
<b>AssistNow Autonomous Offline</b>	The Oyster will track successfully where other devices just give up. This fantastic technology allows the GPS to predict which satellites are in orbit above it and to dramatically reduce the time-to-first-fix of the GPS, and the overall performance of the GPS, especially in 'urban canyon' or forested environments.

## 1.3. Software and Data Management

Data from the Oyster Sigfox device is sent via the Sigfox cloud infrastructure to the back-end server platform for processing and reporting.

This can be Digital Matter's Telematics Guru platform which has built-in support for the Oyster Sigfox device and protocols, or to your own server platform. Please contact Digital Matter if you required information on the integration of the Oyster Sigfox data formats.

## 1.4. Committed to Quality

We take pride in designing each of our products with the goal of providing the best performance and reliability possible in the price range of that product. "Engineered to outperform".

Not all GPS tracking devices operate with the same level of performance or reliability, especially when exposed to extreme conditions in the field. In addition, we only use the highest quality parts and the latest assembly and quality control techniques to ensure the reliability and long life of our products.

Every device is individually tested at production.

All Digital Matter devices are covered by a one-year manufacturer's warranty.

## 1.5. Contact Information

For the latest version of this document plus other product information please visit our website at [www.digitalmatter.com/support](http://www.digitalmatter.com/support)

Email: [info@digitalmatter.com](mailto:info@digitalmatter.com)