



MiX Wireless Asset Tracker Commissioning & Installation Guide - Release2



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1 Introduction

The MiX Wireless Asset Tracker is a low-profile, rugged 2G or 4G (LTE Cat-M1/NB-IoT) GPS tracking device designed for tracking of non-powered assets, trailers or any other asset where long battery life is required without sacrificing the frequency of update. The MiX Wireless Asset Tracker makes use of removable off-the shelf batteries for easy maintenance and reduced cost.

Three hardware models are available for the Mix Wireless Asset Tracker in order to satisfy a broader spectrum of asset management solution in the market. These hardware models are called Remora2, Oyster2 and Yabby with the main difference in size and batteries. Which will translate into cost and life expectancy difference between them.

Key hardware features:

- Works with off-the-shelf batteries.
- Rugged weatherproof housing (IP67)
- High sensitivity GPS
- 2G / 3G connectivity options
- 3D Accelerometer for movement detection
- Wireless – integrated internal antennas
- High sensitivity GPS receiver and Assisted GPS
- Convenient mounting tabs



Change History

Date	Version	Person	Change Made
10/07/2019	2.0	R. Grobbelaar	Draft
19/08/2019	2.1	R. Grobbelaar	1 st Release

2 Software Configuration

This document serves as a guideline and outlines the methods to be used during the commissioning of a fleet device on the MiX Fleet Manager platform

Assumptions

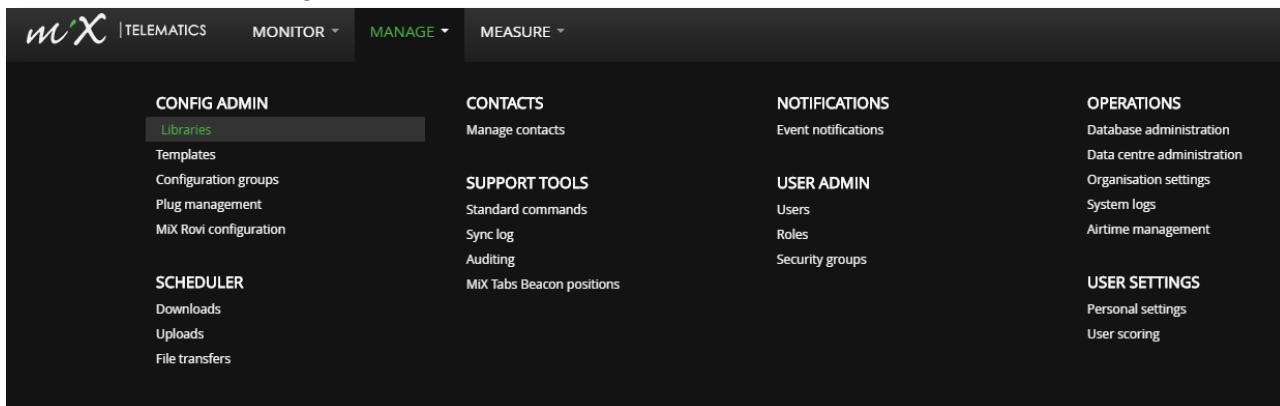
The user has access and has obtained the relevant permissions to the following tools:

MiX Fleet Manager Modules:

- Config Admin
- Fleet Admin
- Tracking

2.1 Making the device available in MiX Fleet Manager

1. Log on to the applicable database
2. Click **Manage**
3. Under Config Admin, click on **Libraries**



The screenshot shows the MiX Fleet Manager interface with a dark theme. The top navigation bar includes 'TELEMATICS', 'MONITOR', 'MANAGE' (which is currently selected and has a dropdown arrow), and 'MEASURE'. The 'MANAGE' dropdown menu is open, showing 'CONFIG ADMIN' (with 'Libraries' highlighted in green), 'CONTACTS', 'NOTIFICATIONS', 'OPERATIONS', 'SCHEDULER', 'SUPPORT TOOLS', 'USER ADMIN', 'USER SETTINGS', and 'MEASURE'. The 'CONFIG ADMIN' section contains links for 'Templates', 'Configuration groups', 'Plug management', and 'MiX Rovi configuration'. The 'SCHEDULER' section contains links for 'Downloads', 'Uploads', and 'File transfers'. The 'CONTACTS' section has a link to 'Manage contacts'. The 'NOTIFICATIONS' section has a link to 'Event notifications'. The 'OPERATIONS' section lists 'Database administration', 'Data centre administration', 'Organisation settings', 'System logs', and 'Airtime management'. The 'USER ADMIN' section lists 'Users', 'Roles', and 'Security groups'. The 'USER SETTINGS' section lists 'Personal settings' and 'User scoring'.

4. Click **Mobile Device Library**
5. Scroll down to **Remora, Oyster or Yabby**.
6. Click on the down arrow next to it
7. Click ***Make Available**
8. Click **Save**

Mobile device library		Filter
Event library	FM 3607i/3617i	Available
Firmware library	FM 3616i (Tracer)	Available
Location library	FM 3707i/3717i	Available
Mobile device library	FM 3716i (Tracer)	Available
Parameter library	FM 3807i/3817i	Available
Peripheral library	FM Tracer	Available
	FM200	Available
	G525 Solar Tracker	Available
	MIX Tabs Beacon	Available
	MIX2310i	Available
	MIX4000	Available
	MIX6000	Available
	Oyster	Available
	PT MOB (Mobile Phone Track and Trace)	Available
	PT SAT SPOT (Satellite Personnel Track and Trace)	Available
	Remora	Available
	Track and Trace	★ Make available

Once the Unit type is released. This will automatically generate a default configuration group called “Default configuration group for Remora”, “Default configuration group for Oyster” or “Default configuration group for Yabby” that combines the necessary default mobile device and event template.

2.2 Operational Mode setting

All the devices can operate in two different modes of operation.

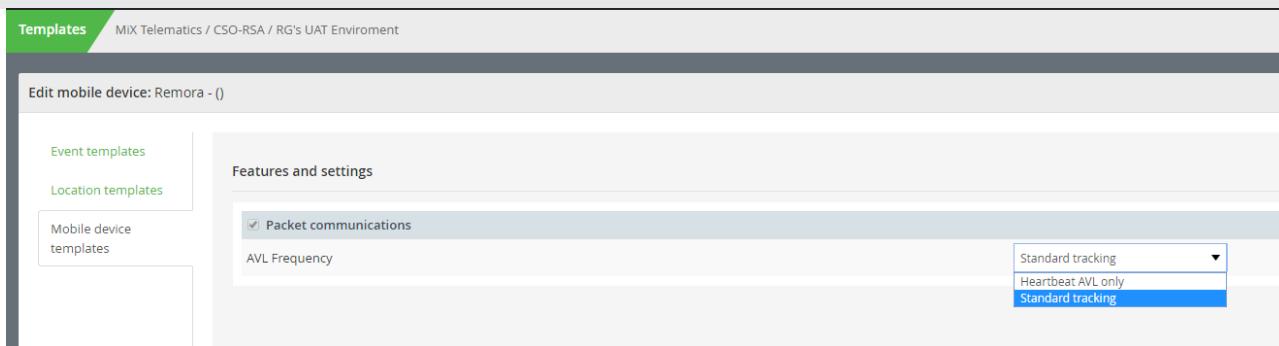
1. Standard Tracking

- This is the **default** setting. When this setting is used the device will operate as per normal tracking devices with in trip AVL interval of 2min (Remora and Oyster) or 15min (Yabby).
- This setting will also include a heartbeat event if the device does not move for at least 12 hrs.

2. Heartbeat AVL only

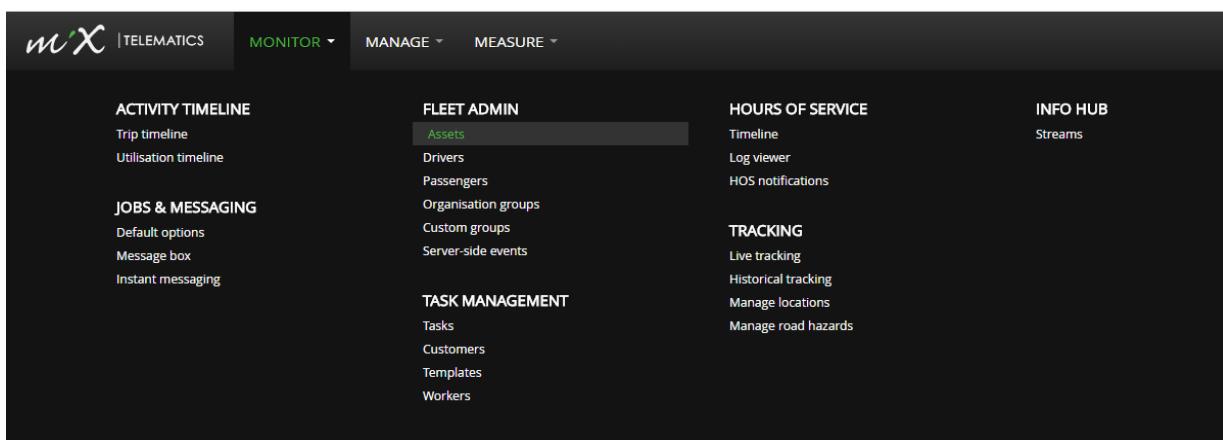
- This operational mode will ignore any tracking and will only send 1 GPS location called “heartbeat” to MiX Fleet Manager. This is useful for asset that does not move a lot, but a health status check is needed. This mode of operation will deliver the longest battery life for the product. This event will also be visible in infohub.

To change the mode of Operation, you need to modify the Mobile Device Template in “**Config Admin – Templates**”



2.3 Create an Asset

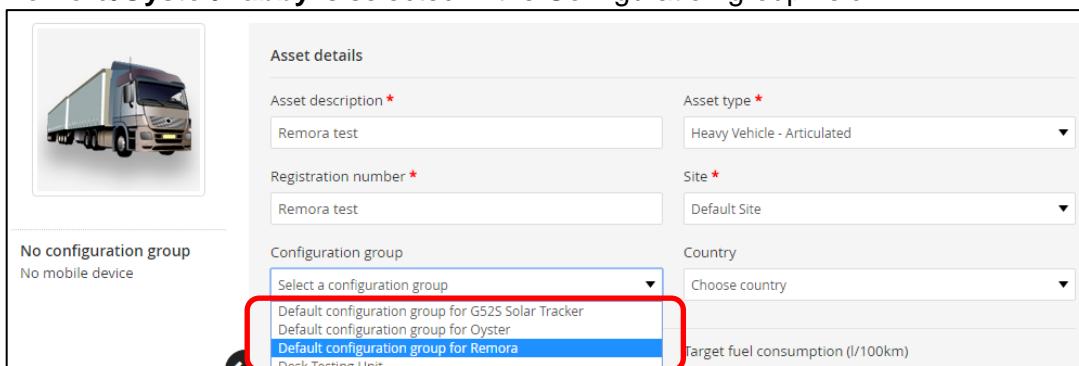
3. Click Monitor
4. Under Fleet Admin select Assets



5. Click the Add button on the top right corner

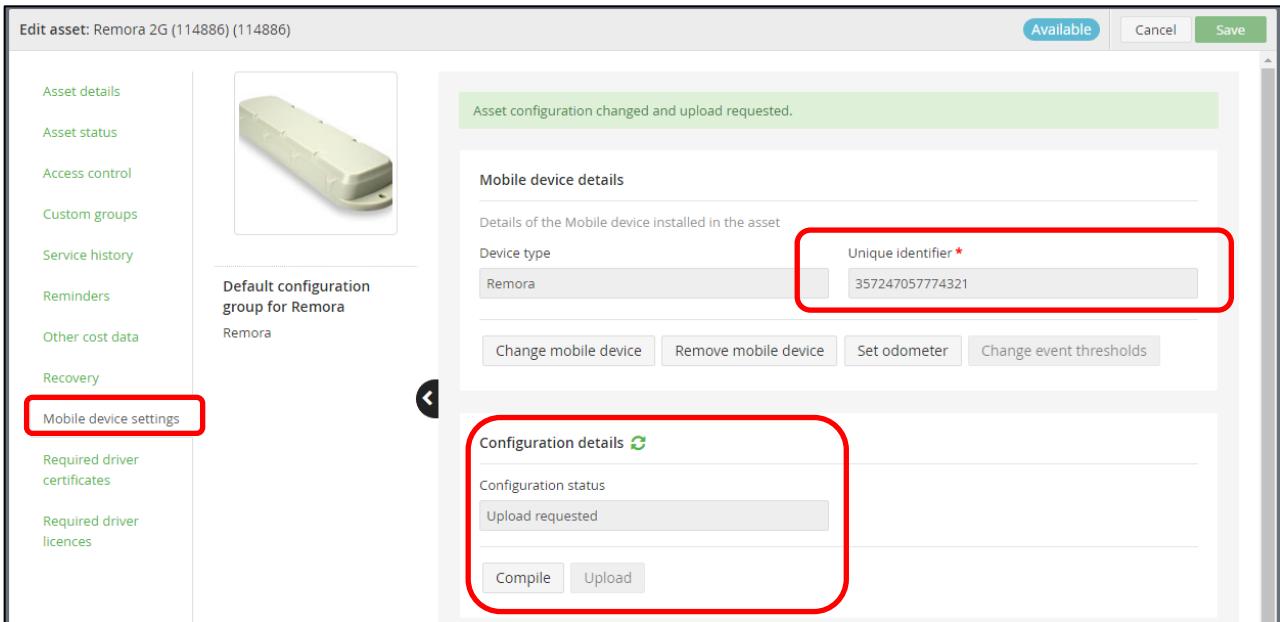


6. Fill in all the required fields making sure **Default configuration group for Remora/Oyster/Yabby** is selected in the Configuration group field.



 No configuration group No mobile device	Asset details
	Asset description * <input type="text" value="Remora test"/>
	Asset type * <input type="text" value="Heavy Vehicle - Articulated"/>
	Registration number * <input type="text" value="Remora test"/>
	Site * <input type="text" value="Default Site"/>
	Configuration group <input type="text" value="Select a configuration group"/> <div style="border: 1px solid red; padding: 2px; display: inline-block;"> Default configuration group for G525 Solar Tracker Default configuration group for Oyster Default configuration group for Remora </div>
	Country <input type="text" value="Choose country"/>
	Target fuel consumption (l/100km) <input type="text" value="10.5"/>

7. Click **Save**
8. In the same window, click **Mobile Device Settings**
9. Enter the applicable device IMEI number in the “Unique Identifier” field



The screenshot shows the 'Edit asset' screen for 'Remora 2G (114886) (114886)'. The left sidebar has a red box around 'Mobile device settings'. The main area shows 'Asset configuration changed and upload requested.' in a green bar. Under 'Mobile device details', the 'Device type' is 'Remora' and the 'Unique identifier*' field contains '35724705774321', which is also highlighted with a red box. Below that are buttons for 'Change mobile device', 'Remove mobile device', 'Set odometer', and 'Change event thresholds'. A red box highlights the 'Configuration details' section, which shows 'Configuration status' as 'Upload requested' and has 'Compile' and 'Upload' buttons.

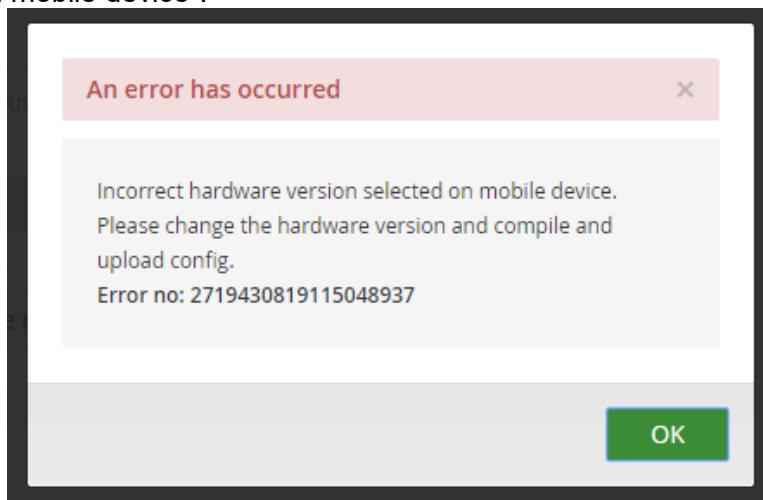
10. Click **Save**
11. Press **Compile** and **Upload Configuration***

*Note: Configuration status will remain as “Upload requested”

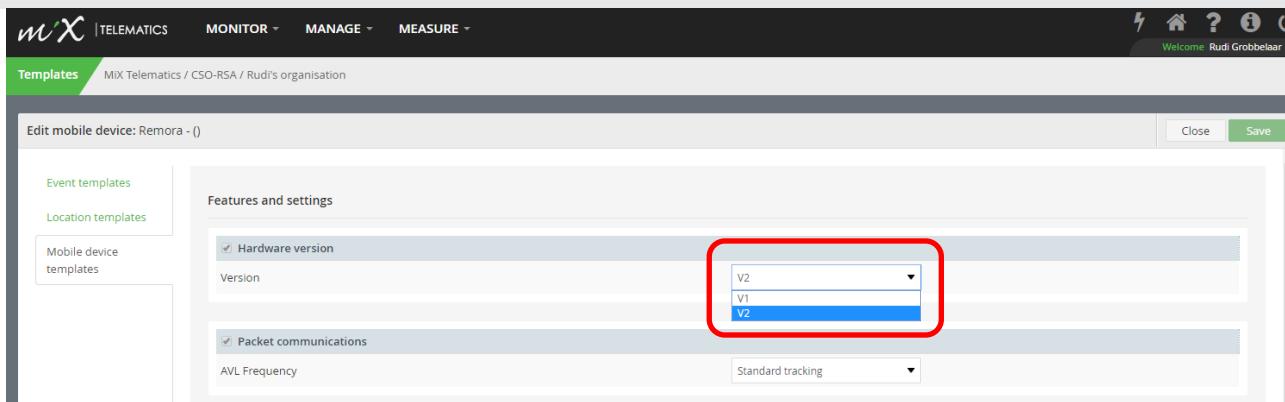
2.4 Configuration Error (Remora and Oyster)

The Remora and Oyster have two hardware versions, so you need to be sure to select the correct Hardware version for the configuration group. By default, the V2 hardware will be enabled.

If the Hardware version is incorrect, you will get the following error stating, “Incorrect hardware version selected on mobile device”.



Go to Template level and change the Hardware version to the correct one.



Templates / MIX Telematics / CSO-RSA / Rudi's organisation

Edit mobile device: Remora - ()

Event templates
Location templates
Mobile device templates

Features and settings

Hardware version

Version

Packet communications

AVL Frequency

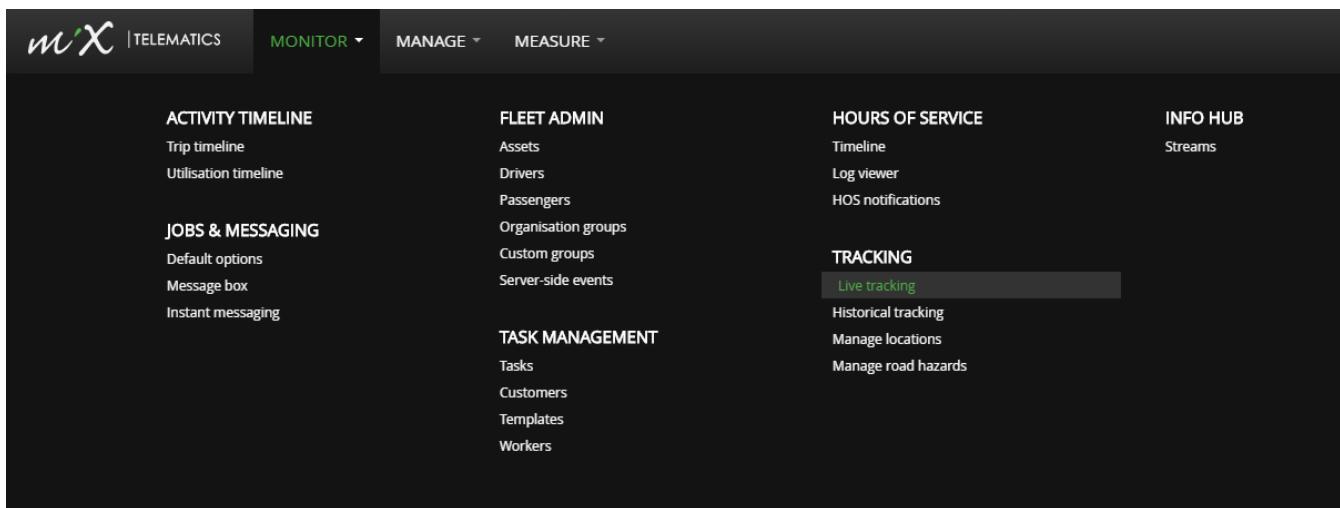
Standard tracking

Close Save

Save and update configuration again.

2.5 Confirming Connectivity on MiX Fleet Manager

1. Communication between the Wireless Asset Tracking device and MiX Fleet Manager can be confirmed in the “Live Tracking” module.
2. Click Monitor
3. Under “Tracking” Select “Live tracking”



MONITOR ▾ MANAGE ▾ MEASURE ▾

ACTIVITY TIMELINE

- Trip timeline
- Utilisation timeline

JOB & MESSAGING

- Default options
- Message box
- Instant messaging

FLEET ADMIN

- Assets
- Drivers
- Passengers
- Organisation groups
- Custom groups
- Server-side events

TASK MANAGEMENT

- Tasks
- Customers
- Templates
- Workers

HOURS OF SERVICE

- Timeline
- Log viewer
- HOS notifications

TRACKING

- Live tracking**
- Historical tracking
- Manage locations
- Manage road hazards

INFO HUB

- Streams

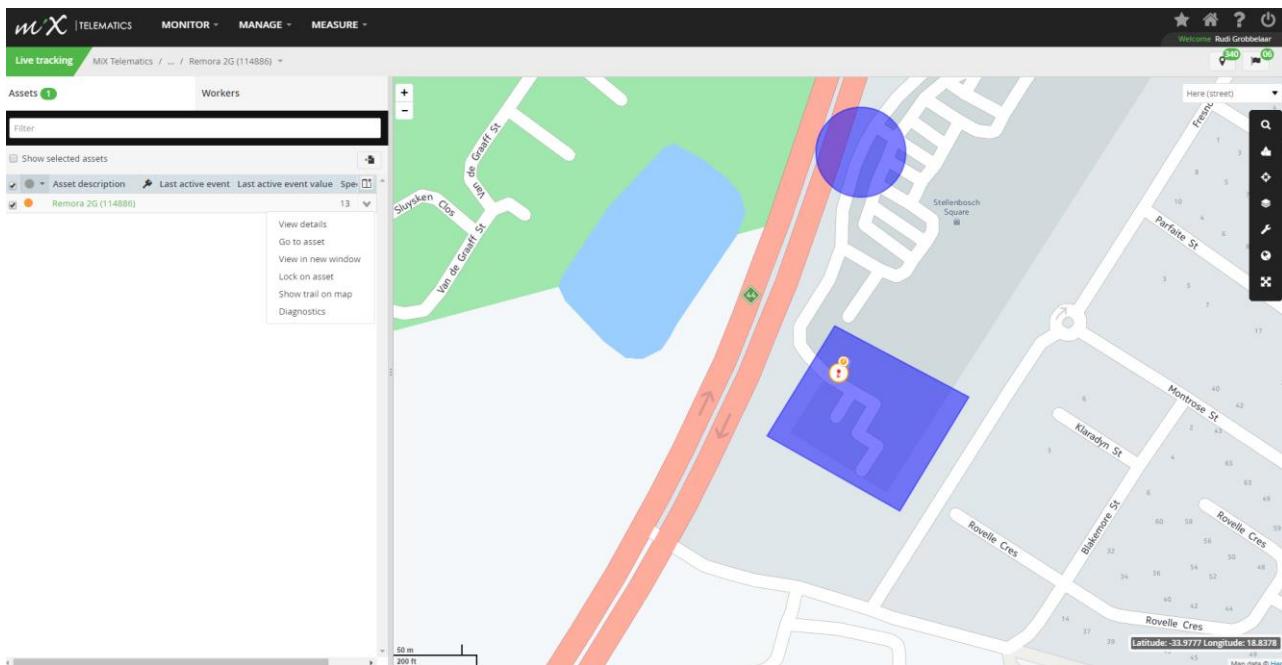
4. Select the asset in the selection criteria as per the set up done in “**2.3 Asset Creation**”

Select asset(s)

▶	17.3 Shakedown Database	8	▶	Boumore
▶	17.5 Testing DB Creation		▶	Default Site
▶	17.5 Testing DB Creation 2		▶	New Test Site
▶	_MiX Internal - Database Templates		▶	Remora Testing
▶	BAS 1.7 Field Trial	6	▶	Trevor's Site
▶	H&O Compass - Mozzie Cabs	58		
▶	Johan SQL Permissions Test			
▶	Live Vehicles Copy	435		
▶	MC	1		
▶	MiX Internal - DynaMiX Fleet Management ...	136		
▶	MiX Internal - MagiX on Fleets	1		
▶	MiX Internal - MLC Training	9		
▶	MIX INTERNAL - PM - CT MiX 2000	5		
▶	Mix Internal - Task Management Demos			
▶	Mix Internal - Task Management Training			

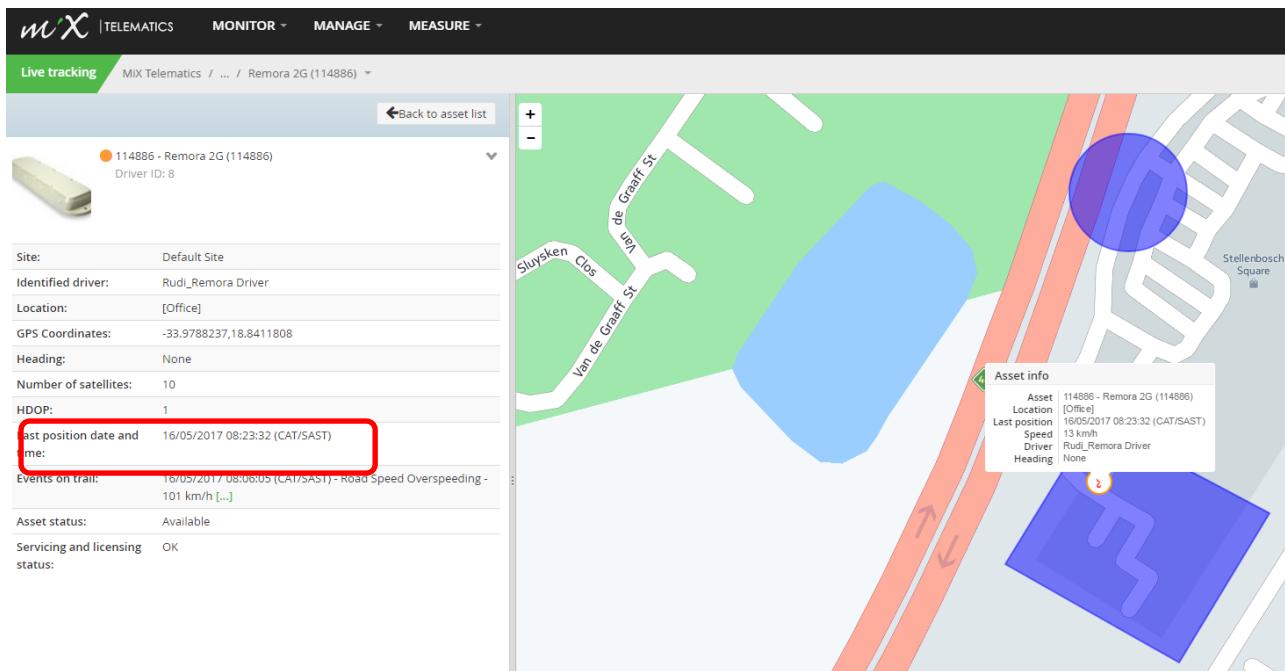
1/1000 selected Cancel Select

5. The asset will only appear in the Live tracking module if it has communicated at least once with MiX Fleet Manager.
6. Click the drop down arrow in the asset list next to the asset required and select “**View details**”.



The screenshot shows the MiX Telematics Live Tracking interface. The top navigation bar includes 'TELEMATICS', 'MONITOR', 'MANAGE', 'MEASURE', and a user 'Rudi Grobbelaar'. The main area is titled 'Live tracking' and shows a map of a residential area with several assets tracked. One asset, 'Remora 2G (114886)', is highlighted with a large blue circle and a red arrow indicating its movement path. The map displays street names like 'Sluisken Clos', 'Van de Graaff St', 'de Graaf St', 'Stellenbosch Square', 'Parfaite St', 'Montrose St', 'Klaradyn St', 'Blakemore St', and 'Rovelle Cres'. A legend on the left indicates asset types: green for vehicles, blue for workers, and red for other assets. A sidebar on the left shows a list of selected assets, including 'Remora 2G (114886)', with options to 'View details', 'Go to asset', 'View in new window', 'Lock on asset', 'Show trail on map', and 'Diagnostics'. A scale bar at the bottom left shows 50m and 200ft.

7. “Latest position date and time must be current positon on the map must match the installation location.



2.6 Infohub Streams

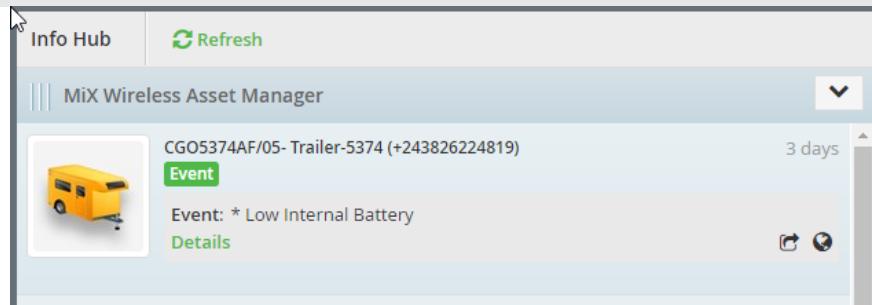
2.6.1 Low Battery Event

Receive events stream as soon as the battery level is low and required maintenance.

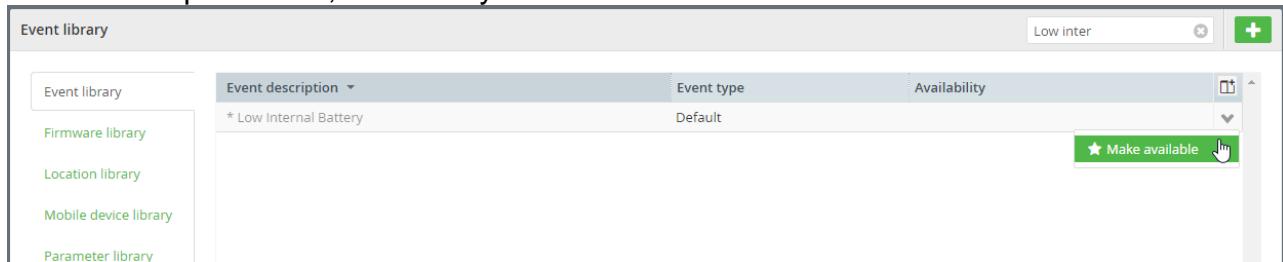
Remora: This event will be send when battery level drops below 7%.

Oyster and Yabby: Battery Low battery flag will be set based on the table below.

Voltage Range	Capacity Estimate	V Batt Good Status Flag
4.80 – 5.30 V	40% + remaining	Set (1)
4.65 – 4.80 V	25 – 40 % remaining	Set (1)
4.50 – 4.65 V	10 – 25% remaining	Clear (0)
4.20 – 4.50 V	0 – 10% remaining	Clear (0)



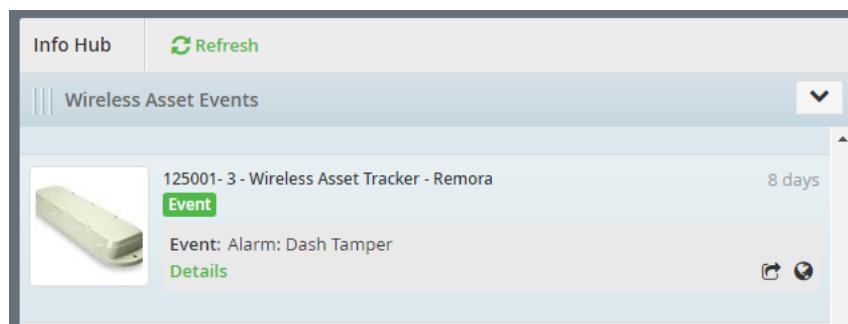
This event will be visible once made available in event library. No change needs to be made in template level, this is a system event.



The screenshot shows the Event library interface. On the left is a sidebar with 'Event library' selected, and other options like 'Firmware library', 'Location library', 'Mobile device library', and 'Parameter library'. The main area shows a table with columns 'Event description', 'Event type', and 'Availability'. An event for 'Low Internal Battery' is listed with 'Event type: Default'. A 'Make available' button with a star icon is highlighted with a mouse cursor. A 'Low inter' filter is at the top right.

2.6.2 Tamper Alert

To make use of the info hub stream to see Tamper and heartbeat message, you first need to enable the events in event library. This is only available on selected hardware. The Tamper event is a system event and should not be added to the Event Template. You must only ensure that this event is enabled on Library Level.



The Tamper event is only available for the Remora device and you need to ensure that the device is fitted with the magnet sensor.

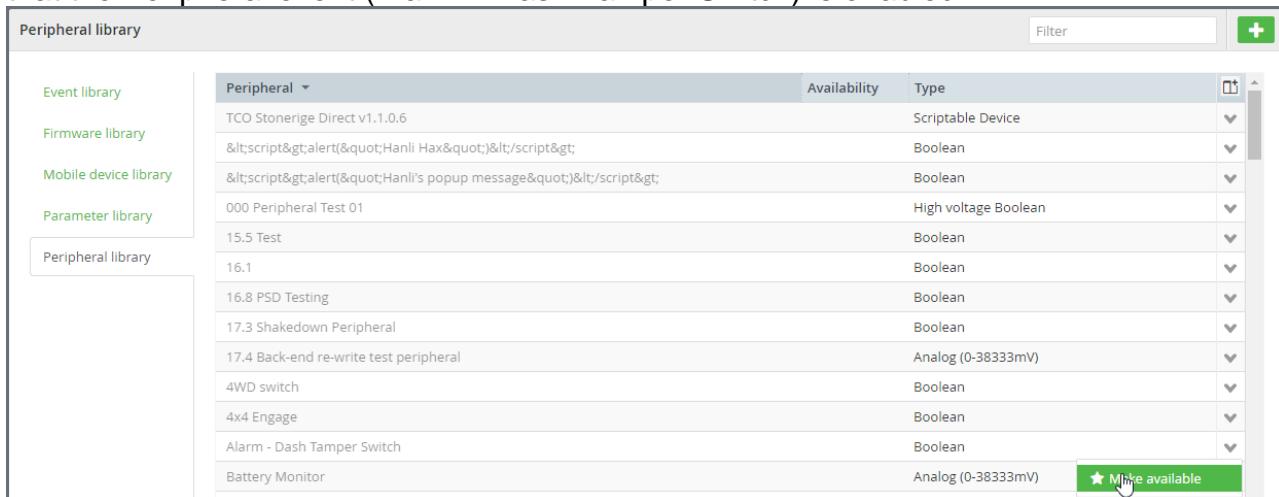
For the Tamper event, please enable "Alarm: Dash Tamper" event.



Event library

Event description	Event type	Availability
Alarm: Dash Tamper	Diagnostic	▼
Alert: Possible CAN Tamper	Diagnostic	▼
Alert: Possible Power Tamper	Diagnostic	▼

If you get the message saying “**Not available - Missing parameters**”, please make sure that the Peripheral event (Alarm – Dash Tamper Switch) is enabled:



Peripheral library

Peripheral	Availability	Type
TCO Stonerige Direct v1.1.0.6	Scriptable Device	▼
<script>alert("Hani Hax");</script>	Boolean	▼
<script>alert("Hani's popup message");</script>	Boolean	▼
000 Peripheral Test 01	High voltage Boolean	▼
15.5 Test	Boolean	▼
16.1	Boolean	▼
16.8 PSD Testing	Boolean	▼
17.3 Shakedown Peripheral	Boolean	▼
17.4 Back-end re-write test peripheral	Analog (0-38333mV)	▼
4WD switch	Boolean	▼
4x4 Engage	Boolean	▼
Alarm - Dash Tamper Switch	Boolean	▼
Battery Monitor	Analog (0-38333mV)	▼

★ Make available

2.6.3 Heartbeat Event

The Heartbeat event will be visible in Info streams when selected. This is the event that will be generated every 24hrs if the device has not moved. This will also be displayed if you have selected the “heartbeat only” mode of operation.



Info Hub

Wireless Asset Events

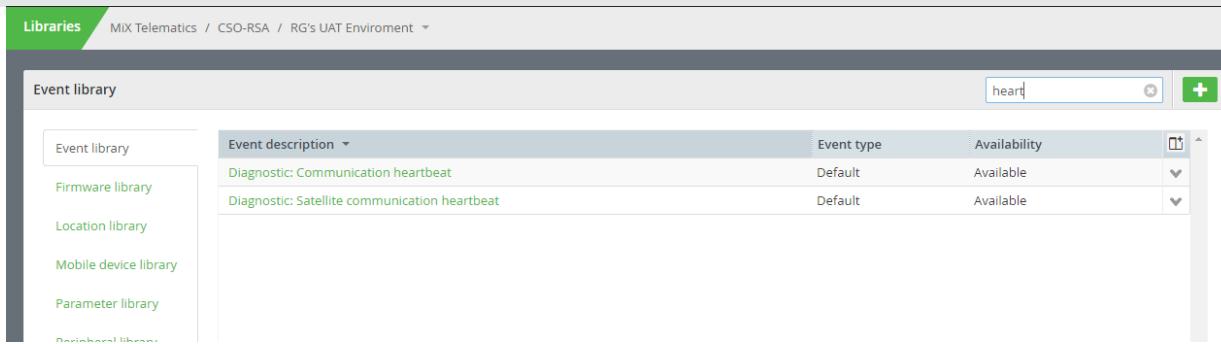
	125001- 3 - Wireless Asset Tracker - Remora	3 hours
	130616- 4 - Wireless Asset Tracker - Oyster	3 hours

Event

Event: Diagnostic: Communication heartbeat

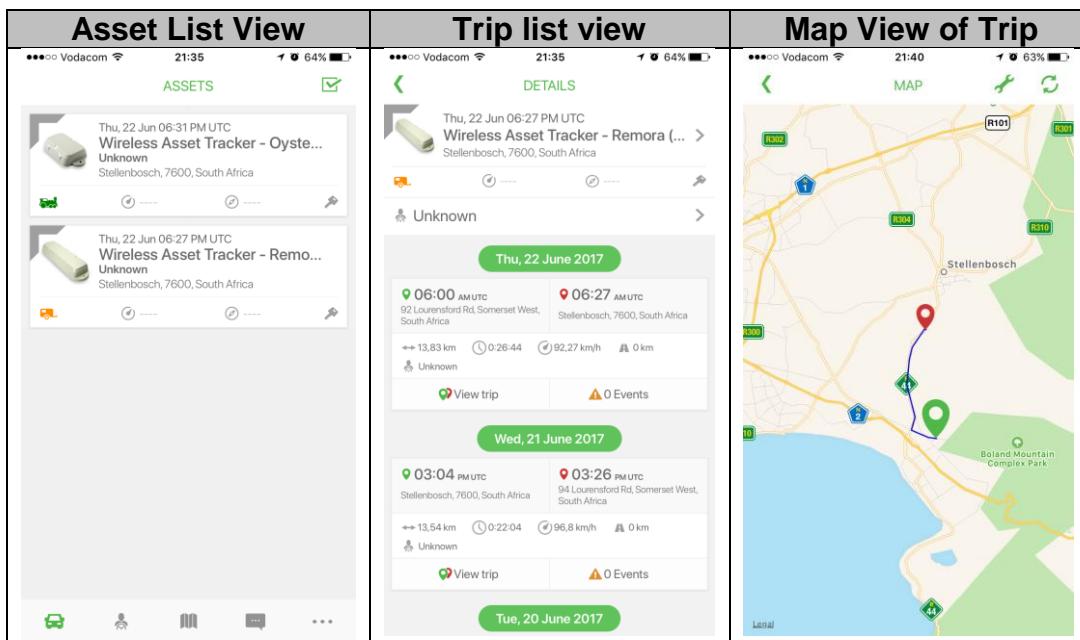
Details

For the Heartbeat event, please enable the “Diagnostic: Communication Heartbeat” event in Library level.



2.7 MiX Fleet Manager Mobile

You are able to view the trip data and events on the Mix Fleet Manager Mobile app also. Just download the app to your smart phone and sign it with your user name and password.



3 Hardware Installation

3.1 Introduction

This section outlines the Installation requirements of the MiX Wireless Asset Tracker.

3.2 Installation Requirements

The MiX Wireless Asset Tracker should only be installed by a suitably qualified vehicle technician with a basic knowledge of the operation of telematics equipment.

3.3 Environmental Requirements

3.3.1 IP Rating

The MiX Wireless Asset Tracking device is an IP67 rated device. It is important to ensure that the device is correctly assembled to achieve the IP rating. Failure to do so may result in damage to the product. Please ensure:

- The enclosure is not damaged before installation.
- Seals supplied with the product are correctly placed.
- Only screws supplied with the product are used.
- The guidelines for closing and sealing the product are followed as described below in the document.
- The device is only ever opened in a clean, dry environment.

3.3.2 Static Damage

The device may be damaged by electrostatic discharge if not handled correctly. Ensure adequate static precautions are taken.

Take special care not to touch the ceramic GPS antenna.

3.3.3 Battery Precautions

Ensure that you do not use old and new batteries together.

Ensure that the batteries are always inserted the right way around

Ensure correct batteries are used as per specification

3.4 Setting the APN

The unit has a small database of all public APNs on most networks in the world, so it is not always required to configure the APN as the “auto-APN” feature can be used.

Simply insert the SIM and power the unit up, it will automatically search for the relevant APN and configure it.

- To program a private APN, send an SMS command from a handset in the following format without any spaces:
#*,APN,<apn name>,<user name>,<password>
- If the APN details are omitted, then the APN will be erased and the device will use auto-APN.

Example. #*,APN,custom.APN,user1,pwd1

e.g. for MiX Africa it can be:

#*,APN,ci.co.za
 Or #*,APN,vdccpt01.mixtel.com

NB: the ,<user name>,<password> is not included in the SMS if it is not required.

- To clear any APN and set the unit back to “auto-APN mode” send the following SMS command

#*,APN

3.4.1 Server and Port addresses

When you are using a APN, you need to ensure that that APN does allow access to the OEM server. All data will first be send to these servers, then from there the data will be pushed to MiX Fleet Manager.

Server Name	Server Address
s0.oemserver.com	204.232.190.212
offline-live1.services.u-blox.com	52.48.255.103
offline-live2.services.u-blox.com	52.48.245.159
online-live1.services.u-blox.com	52.48.255.103
online-live2.services.u-blox.com	52.48.245.159

3.5 SIM PIN

If you want to make use of a pinned SIM, the pin that is assigned to the SIM must be that of the pre-programmed pin assigned to the device itself.

If you use any other pin, the device will PUK the SIM.

To obtain the correct SIM pin for your device, please request from support.

3.6 Device Installation

The device can be mounted on the asset to be tracked using screws, bolts, cable ties, or industrial adhesives. When choosing a mounting point, you have two competing goals:

1. To minimise the chances of the device being accidentally crushed or dislodged.
2. To maximise the GPS and mobile reception, and provide adequate ventilation.

Since the device is a battery powered device, reception is critical to its performance. While other products rely on their high-quality GPS receivers for enhanced accuracy and the ability to operate in very low signal, the primary concern for the Mix Wireless asset Tracker is the battery used during each GPS fix.

If possible, choose a mounting point that will not result in elevated temperatures. For instance, mounting the device in direct sunlight on the dash of an unventilated cabin may cook the batteries, leading to abnormally short service life.

3.7 Maintenance

3.7.1 Battery Maintenance

The MiX Wireless Asset Tracker has a Low battery warning alert that the user will be able to see in MiX Fleet Manager. This will indicate that the device would need a replacement set of batteries for the device will stop reporting soon. The life of the battery will depend on the conditions in which it operates.

When replacing the batteries the LED should flash continuously. If it does not, it means the unit has not yet reset. In this case, remove the batteries for a minute or two to allow any residual charge to drain, and then reinsert them. Failure to reset the unit will prevent automatic APN detection, and proper resetting of the battery life statistics.

Ensure that the device is sealed properly when changing batteries and take note that the seal is secure in place and not damaged.

Remember to use all screws provided when closing the enclosure.

3.7.2 Seal Maintenance

When replacing the batteries, please inspect the condition of the silicon seal. Seals should be replaced every 3 years to ensure reliable performance.

3.8 LED Behavior

The LED is a useful tool for understanding what the device is doing.

Please note: The LED is located on the PCB and is only visible with the housing open.

Behavior	Further Information
Off	If the LED is not on at all, it is likely that the battery is flat, or that the device is asleep. Measure the battery voltage with a multi-meter. If there is charge and you wish to see some activity reset the device by removing and replacing the batteries.
From power-on-reset, LED flashes for duration of startup connect, fix, connect. Or until 10 min have passed.	After a reset of the device, the LED will flash. It will continue to flash until it has completed its startup sequence of: connect to server (4Hz flash); get a GPS fix (1Hz flash); and reconnect to the server (4Hz flash). If the connections are not successful, this will timeout after 10 minutes.
After first sleep - off	After the startup sequence has completed (connect, fix, connect) or after 10 min, the LED will be switched off. No LED flashes will occur, until a power-on-reset, or tamper.
From a device reset (not power-on-reset), for example after a firmware update - no flashes.	The LED reset behavior only occurs on a power-on-reset. It does not occur on a normal device reset, such as when the firmware is updated.

3.9 GPS Tracking

General Operation Description

The GPS tracking firmware is designed to provide asset tracking in a variety of environments. There are 2 high level modes for this:

- Trip based tracking: trips are started and stopped based on movement. If device has moved more than 250m from last stopped position, trip will start. If device stay on same location without movement, trip will end. Trips are tracked with periodic GPS points.
- Heartbeat Only: GPS positions are logged at configurable intervals. This is periodic only, with no concept of trips.

Movement based trips use the accelerometer to wake the device up on movement. The GPS is then used to determine if the movement meets the trip start criteria, which is a distance threshold. It is important to note that the accelerometer is simply used to **wake the device up**. The GPS is used to decide on the trip status.

System Parameter Defaults

The following table briefly describes the default settings in the three power bands.

Please note: The **default** mode is **Standard Tracking**, not Heartbeat only tracking:

Standard Tracking	In trip		Out of trip	
	GPS log period	Upload period	GPS log period	Upload period
Remora	2 min	30 min	12 hrs	24 hrs
Oyster				
Yabby	15 min	n/a		
Heartbeat Only (all)	-	-	24hrs	

4 Remora2

This part of the document covers specifically only the Remora2 device.

4.1 Inserting the SIM card

The Remora2 takes a 4FF, Nano SIM card.

The SIM holder is on the underside of the main board, next to the riser furthest away from the batteries. When handling the Remora2 be careful not to touch the GPS antenna, to minimise the risk of damaging the sensitive GPS amplifiers with static discharge.

- Locate the sim holder by finding the picture on top of the PCB.
- The SIM should be inserted with the keyed corner on the inner side, and the contacts orientated up to the underside of the main board.
- Be sure to push the SIM card all the way in so the card is not poking out.



4.2 Battery Insertion

The Remora2 is powered by 2 x D Cell Lithium Thionyl Chloride (LTC) batteries for super long battery life. LTC batteries also offer continued operation in extreme temperatures.

Take care to insert the batteries with the correct polarity, as the Remora2 does not have reverse polarity protection. The springs are the negative terminals.

Once inserted, the LED next to the GPS antenna should flash briefly. If it does not, it means the unit has not yet reset. In this case, remove the batteries for a minute or two to allow any residual charge to drain, and then reinsert them. Failure to reset the unit will prevent automatic APN detection, and proper resetting of the battery life statistics



4.3 Housing Assembly

Note: IP67 Rating is dependent on this step

Ensure that the clear **silicon seal** is in good condition, is lying flat, and is not fouled by any plastic swarf or by protruding connector cables.

Place the lid on the base, and gently squeeze it shut. Foam in the lid will compress against the batteries, holding them firmly in place when the unit is turned over.

Tighten the **10 screws** to a uniform tightness. On the first assembly the screws may be quite stiff. An electric screwdriver with a torque limiting clutch is recommended.

The torque setting should be 0.7 Nm.

The screws used are a thermoplastic screw: 3.5mm x 12mm (BN82428).

If you wish to replace the batteries and open the housing, be sure to check that the silicon seal is in good condition before closing the housing again.



4.4 Tamper Detect

The tamper detection is an optional extra for the Remora device.

You need to mount the magnet against the asset. When the device is removed to the position, a tamper alert message will be send that is viewable in info hub. This is an active event.

Tamper alert will initiate a GPS lock first, once lock is obtained, the tamper signal will be send (usually under 30s). If there is no GPS lock, the device will timeout after 60 seconds and send Tamper event with last known GPS location.

To view this event in Infohub, please refer to section **2.6.2**.

5 Oyster2

This part of the document cover specifically only the Oyster2 device.

5.1 Inserting the SIM card

The Oyster makes use of a **Micro SIM** card – Form factor 3FF.

This SIM holder is on the underside of the PCB. The device would need to be lifted out of the housing to insert the SIM.

When handling the Oyster, be careful not to touch the GSP antenna to minimise risk of damaging the sensitive GPS amplifiers with static discharge.

Slide the SIM into the holder with the **keyed corner first** and **sim contacts orientated down** to the main board.



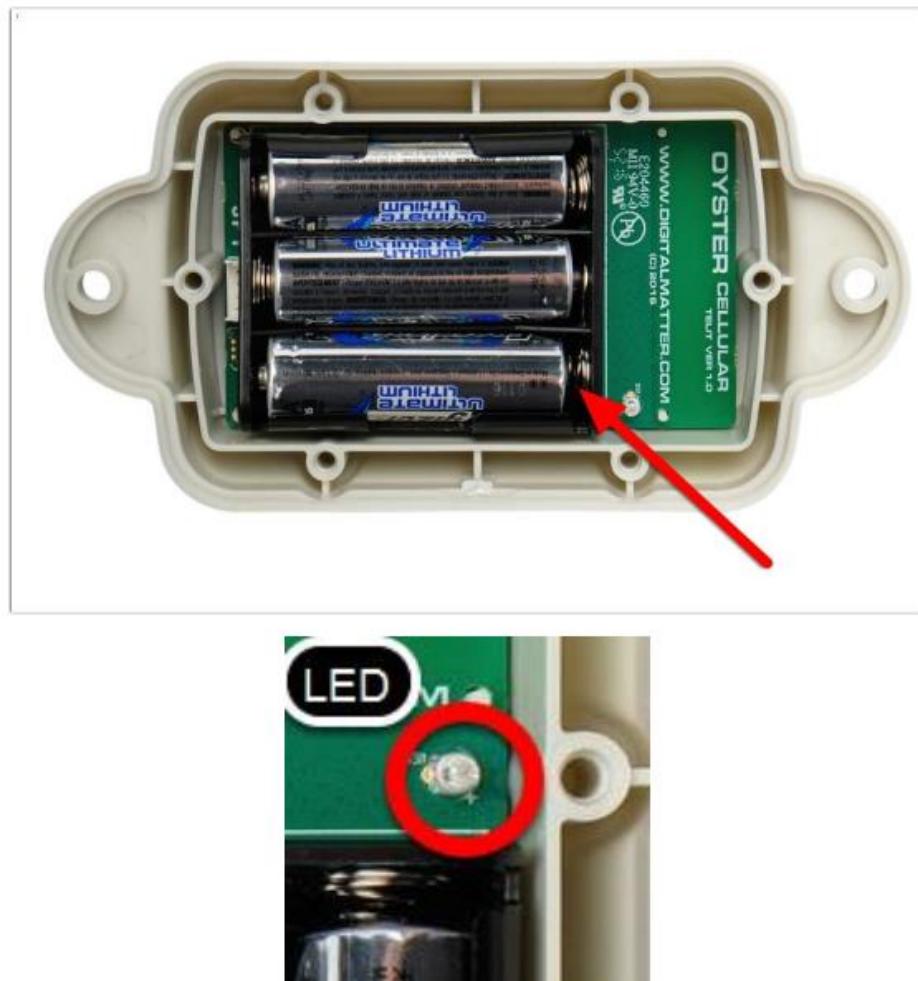
5.2 Battery Insertion

The Oyster2 uses 3 x 1.5-3.6V AA batteries and does not have reverse voltage protection so take care to insert the batteries with the correct polarity, the springs being the negative terminals.

It is very important to use **1.5V Lithium AA** or **3.6V Lithium thionyl chloride (LTC) AA** batteries. If you use normal Alkaline AA batteries, then the batteries will only operate for about 50% of their useful life.

The Oyster does not have reverse voltage protection. Insert the batteries with the **correct polarity**. The springs are the negative terminals.

Once inserted, the LED should flash continuously. If it does not, it means the unit has not yet reset. In this case, remove the batteries for a minute or two to allow any residual charge to drain, and then reinsert them. Failure to reset the unit will prevent automatic APN detection, and proper resetting of the battery life statistics.



5.3 Housing Assembly

Note: IP67 Rating is dependent on this step

Ensure that you always follow the instructions when opening or closing of the housing.

Ensure that the clear **silicon seal** is in good condition, is lying flat, and is not fouled by any plastic debris or other material.

Close the housing, and gently squeeze it shut. Foam on the lid will compress against the batteries, holding them firmly in place.

Tighten the **6 screws** to a uniform tightness. On the first assembly, the screws may be quite stiff. An electric screwdriver with a torque limiting clutch is recommended.

The torque setting should be 0.7 Nm.

For reference: the screws used are a thermoplastic screw: 3.5mm x 12mm (BN82428).

If you wish to replace the batteries and open the housing, be sure to check that the silicon seal is in good condition before closing the housing again.



6 Yabby

This part of the document cover specifically only the Yabby device.

6.1 Inserting the SIM card

The Yabby makes use of a **Nano SIM** card – Form factor 4FF.

This SIM holder is on the underside of the PCB. The device would need to be lifted out of the housing to insert the SIM.

When handling the Yabby, be careful not to touch the GSP antenna to minimise risk of damaging the sensitive GPS amplifiers with static discharge.

Slide the SIM into the holder with the **keyed corner first** and **sim contacts orientated down** to the main board.



6.2 Battery Insertion

The Oyster makes use of 3 x 1.5V AAA Lithium batteries. Recommended batteries is Energizer Lithium Ultimate.

Maximum voltage the device can handle is 6V, so do not add batteries with higher combined voltage.

It is very important to use **1.5V Lithium AAA** batteries. If you use normal Alkaline AAA batteries, then the batteries will only operate for about 50% of their useful life. Energizer Lithium Ultimate has an average full charge of 1.8V per battery.

The Yabby does not have reverse voltage protection. Insert the batteries with the **correct polarity**. The springs are the negative terminals.

Once inserted, the LED should flash continuously. If it does not, it means the unit has not yet reset. In this case, remove the batteries for a minute or two to allow any residual charge to drain,

and then reinsert them. Failure to reset the unit will prevent automatic APN detection, and proper resetting of the battery life statistics.



6.3 Housing Assembly

Note: IP67 Rating is dependent on this step

Ensure that you always follow the instructions when opening or closing of the housing.

Ensure that the clear **silicon seal** is in good condition, is lying flat, and is not fouled by any plastic debris or other material.

Close the housing, and gently squeeze it shut. Foam on the lid will compress against the batteries, holding them firmly in place.

Tighten the **6 screws** to a uniform tightness. On the first assembly, the screws may be quite stiff. An electric screwdriver with a torque-limiting clutch is recommended.



7 Troubleshooting

7.1 Not Connecting

If a device is not connecting, it is usually SIM or power related:

1. SIM card:

- Installed correctly – orientation? See the installation section.
- No SIM PIN? Either use no SIM PIN, or the device's SIM PIN.
- Has credit/airtime?
- Device has SIM's APN? Either Auto-APN or do you need to SMS it?

2. Internal battery:

- Is the batteries correctly orientated?
- Voltage? Measure the battery voltage with a multi-meter.
- On reset, does the LED flash? Be sure to reset by disconnecting the solar panel, external power and the internal battery. See the LED flash meanings in the general FW section.

If this doesn't work, contact Support for assistance.

7.2 No Update

If the device has not reported when it should have, consider the following:

The device is designed to work on a battery, so retries are limited. If there is a network glitch or the device is out of coverage, it will only try to upload for 3 minutes. If it times out, it will go to sleep and only retry on the next scheduled upload. This may be on the start of the next trip.

7.3 Force a Connection

There is no way to initiate a connection remotely because when the device sleeps, it switches off its modem. You will need to wait for the next scheduled connection – Trip Start, Heartbeat.

You can force a connection by resetting the unit. Disconnect the battery and reconnect them.

For **Remora**, fitted with tamper switch, you can use the magnet to trigger the tamper event. This event will only send if the device has a GPS fix.

7.4 SMS Configuration Issues

Consider the following:

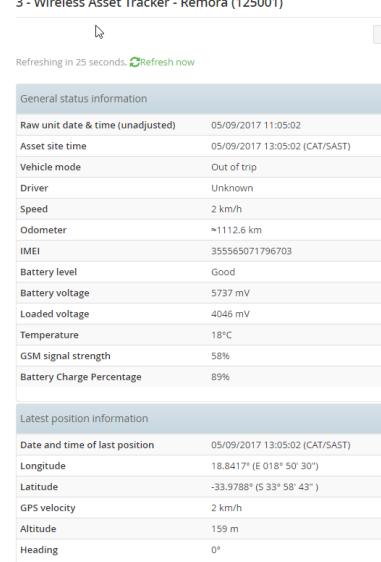
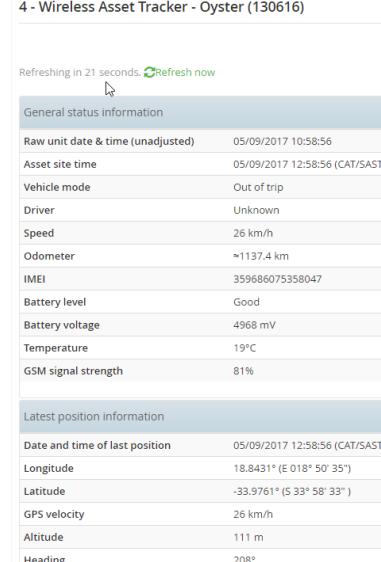
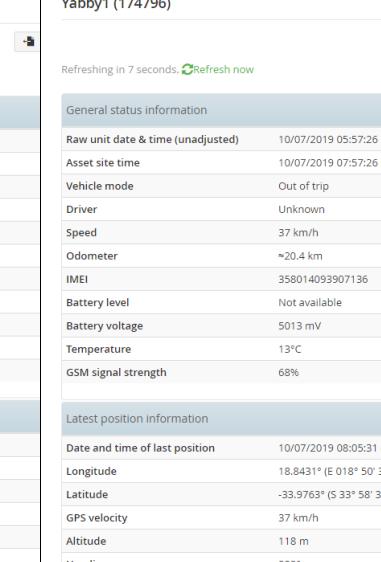
1. Is the SMS format correct?
2. Are the details in the SMS correct? The SMS may be being read, but if the contents are incorrect, it will not connect.
3. Reset the device to get it to turn its modem on and off. Is the LED coming on? Is there sufficient charge in the battery?

4. The SMS is read from the modem just before it is switched off. So to check that it worked, another connection may need to be triggered. Reset the device again to trigger another connection.
5. Is the sender getting a delivery report? This would confirm that the modem is being switched on and the SMS is being delivered.

7.5 Diagnostics Window

The Diagnostics window will give you information about the last received data from the device.

There is some difference between Remora and Oyster devices, mainly in battery voltage sections.

Remora	Oyster	Yabby																																																																																																										
<p>3 - Wireless Asset Tracker - Remora (125001)</p>  <p>Refreshing in 25 seconds.  Refresh now</p> <p>General status information</p> <table border="1"> <tr><td>Raw unit date & time (unadjusted)</td><td>05/09/2017 11:05:02</td></tr> <tr><td>Asset site time</td><td>05/09/2017 13:05:02 (CAT/SAST)</td></tr> <tr><td>Vehicle mode</td><td>Out of trip</td></tr> <tr><td>Driver</td><td>Unknown</td></tr> <tr><td>Speed</td><td>2 km/h</td></tr> <tr><td>Odometer</td><td>≈1112.6 km</td></tr> <tr><td>IMEI</td><td>355565071796703</td></tr> <tr><td>Battery level</td><td>Good</td></tr> <tr><td>Battery voltage</td><td>5737 mV</td></tr> <tr><td>Loaded voltage</td><td>4046 mV</td></tr> <tr><td>Temperature</td><td>18°C</td></tr> <tr><td>GSM signal strength</td><td>58%</td></tr> <tr><td>Battery Charge Percentage</td><td>89%</td></tr> </table> <p>Latest position information</p> <table border="1"> <tr><td>Date and time of last position</td><td>05/09/2017 13:05:02 (CAT/SAST)</td></tr> <tr><td>Longitude</td><td>18.8417° (E 018° 50' 30")</td></tr> <tr><td>Latitude</td><td>-33.9788° (S 33° 58' 43")</td></tr> <tr><td>GPS velocity</td><td>2 km/h</td></tr> <tr><td>Altitude</td><td>159 m</td></tr> <tr><td>Heading</td><td>0°</td></tr> </table>	Raw unit date & time (unadjusted)	05/09/2017 11:05:02	Asset site time	05/09/2017 13:05:02 (CAT/SAST)	Vehicle mode	Out of trip	Driver	Unknown	Speed	2 km/h	Odometer	≈1112.6 km	IMEI	355565071796703	Battery level	Good	Battery voltage	5737 mV	Loaded voltage	4046 mV	Temperature	18°C	GSM signal strength	58%	Battery Charge Percentage	89%	Date and time of last position	05/09/2017 13:05:02 (CAT/SAST)	Longitude	18.8417° (E 018° 50' 30")	Latitude	-33.9788° (S 33° 58' 43")	GPS velocity	2 km/h	Altitude	159 m	Heading	0°	<p>4 - Wireless Asset Tracker - Oyster (130616)</p>  <p>Refreshing in 21 seconds.  Refresh now</p> <p>General status information</p> <table border="1"> <tr><td>Raw unit date & time (unadjusted)</td><td>05/09/2017 10:58:56</td></tr> <tr><td>Asset site time</td><td>05/09/2017 12:58:56 (CAT/SAST)</td></tr> <tr><td>Vehicle mode</td><td>Out of trip</td></tr> <tr><td>Driver</td><td>Unknown</td></tr> <tr><td>Speed</td><td>26 km/h</td></tr> <tr><td>Odometer</td><td>≈1137.4 km</td></tr> <tr><td>IMEI</td><td>359686075358047</td></tr> <tr><td>Battery level</td><td>Good</td></tr> <tr><td>Battery voltage</td><td>4968 mV</td></tr> <tr><td>Temperature</td><td>19°C</td></tr> <tr><td>GSM signal strength</td><td>81%</td></tr> </table> <p>Latest position information</p> <table border="1"> <tr><td>Date and time of last position</td><td>05/09/2017 12:58:56 (CAT/SAST)</td></tr> <tr><td>Longitude</td><td>18.8431° (E 018° 50' 35")</td></tr> <tr><td>Latitude</td><td>-33.9761° (S 33° 58' 33")</td></tr> <tr><td>GPS velocity</td><td>26 km/h</td></tr> <tr><td>Altitude</td><td>111 m</td></tr> <tr><td>Heading</td><td>208°</td></tr> </table>	Raw unit date & time (unadjusted)	05/09/2017 10:58:56	Asset site time	05/09/2017 12:58:56 (CAT/SAST)	Vehicle mode	Out of trip	Driver	Unknown	Speed	26 km/h	Odometer	≈1137.4 km	IMEI	359686075358047	Battery level	Good	Battery voltage	4968 mV	Temperature	19°C	GSM signal strength	81%	Date and time of last position	05/09/2017 12:58:56 (CAT/SAST)	Longitude	18.8431° (E 018° 50' 35")	Latitude	-33.9761° (S 33° 58' 33")	GPS velocity	26 km/h	Altitude	111 m	Heading	208°	<p>Yabby1 (174796)</p>  <p>Refreshing in 7 seconds.  Refresh now</p> <p>General status information</p> <table border="1"> <tr><td>Raw unit date & time (unadjusted)</td><td>10/07/2019 05:57:26</td></tr> <tr><td>Asset site time</td><td>10/07/2019 07:57:26 (CAT/SAST)</td></tr> <tr><td>Vehicle mode</td><td>Out of trip</td></tr> <tr><td>Driver</td><td>Unknown</td></tr> <tr><td>Speed</td><td>37 km/h</td></tr> <tr><td>Odometer</td><td>≈20.4 km</td></tr> <tr><td>IMEI</td><td>358014093907136</td></tr> <tr><td>Battery level</td><td>Not available</td></tr> <tr><td>Battery voltage</td><td>5013 mV</td></tr> <tr><td>Temperature</td><td>13°C</td></tr> <tr><td>GSM signal strength</td><td>68%</td></tr> </table> <p>Latest position information</p> <table border="1"> <tr><td>Date and time of last position</td><td>10/07/2019 08:05:31 (CAT/SAST)</td></tr> <tr><td>Longitude</td><td>18.8431° (E 018° 50' 35")</td></tr> <tr><td>Latitude</td><td>-33.9763° (S 33° 58' 34")</td></tr> <tr><td>GPS velocity</td><td>37 km/h</td></tr> <tr><td>Altitude</td><td>118 m</td></tr> <tr><td>Heading</td><td>222°</td></tr> </table>	Raw unit date & time (unadjusted)	10/07/2019 05:57:26	Asset site time	10/07/2019 07:57:26 (CAT/SAST)	Vehicle mode	Out of trip	Driver	Unknown	Speed	37 km/h	Odometer	≈20.4 km	IMEI	358014093907136	Battery level	Not available	Battery voltage	5013 mV	Temperature	13°C	GSM signal strength	68%	Date and time of last position	10/07/2019 08:05:31 (CAT/SAST)	Longitude	18.8431° (E 018° 50' 35")	Latitude	-33.9763° (S 33° 58' 34")	GPS velocity	37 km/h	Altitude	118 m	Heading	222°
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Field	Remora	Oyster	Yabby
General Status Information			
Raw unit date & time (unadjusted)	Time In UTC		
Asset site time	Adjusted Time		
Vehicle Mode	Status of Vehicle example: "In Trip"		
Driver	Driver name if default driver enabled on Asset		
Speed	Speed of last AVL		
Odometer	Estimated odometer reading		
IMEI	IMEI of device		
Battery level	Good or Bad		
Battery voltage	Open Circuit Voltage of batteries		
Loaded voltage	Lowest voltage during inrush transient. When GSM modem get switched on. This is higher load, so value will always be less than battery voltage.	N/A	
Temperature	Last recorded Temperature		
GSM signal strength	Last recorded GSM signal strength		
Battery Charge Percentage	Based on Battery Voltage, if >1,5V cell used, this is not visible.	N/A	
Latest Position Information			
Date and time of last position	Adjusted last know time stamp		
Longitude	Last Longitude position		
Latitude	Last Latitude Position		
GPS velocity	Last speed recorded		
Altitude	Altitude of last position		
Heading	Heading of last position		