

# EMETTEUR RECEPTEUR

## E-Sea Fix MkII

### Système d'accostage

- A SYSTEM THAT SUITS ANY APPLICATION
- SHOCK AND WATERPROOF TRANSPONDERS
- WIRELESS SOLUTIONS

#### System overview

The E-Sea Fix systems have divided into 3 main parts:

Navigation unit, PC and application software as shown below.

The 4 E-Sea Fix systems have different navigation units. From the small transceiver in the Ultra-Lite(TM) to the advanced super accurate transceivers in the Max system.

The PC can be a standard notebook PC type or similar as long as it has a wireless network interface. Some systems can be set up in less than one minute, with additional time required for others.

Ultra-Lite



CAT



Hybrid



## Introduction

The E-Sea Fix MkII is MARIMATECH's latest version of its' portable pilot Units (PPU).

MARIMATECH has taken advantage of the new wireless technologies along with state of art DGPS receivers and created an entire range of systems suitable for any need.

The E-Sea Fix PPU is a portable ECDIS system with it's own navigation system.

The pilot is no longer depending on the ships navigation system and sensors.

Setting up the system and getting ready to use it takes only a few minutes and being wireless, there are no cables to interrupt the operation.

## Versatile system

Being the largest supplier of PPU's' in the world we learned that the requirements are very different from country to country, from pilot station to pilot station and from job to job.

Bringing Queen Mary II out of Hamburg harbour is different from assisting a 1000 Tons vessel on an route journal. For that reason MARIMATECH has designed not one or two but a number of systems which can cover any application. From a simple system consisting of a compact tablet PC with a lightweight GPS receiver (Ultralite) to a sophisticated high accuracy RTK based DGPS system with a rugged Notebook PC.

## The trend

he world is rapidly becoming more and more 'on-line' and the IT technology is becoming a larger part of our daily life. The old 'time managers' are being replaced with notebook PC's and this trend is now also taking place all over the world for marine pilots. With the new E-Sea Fix MkII range, MARIMATECH has a system that suits your need. This brochure shows some of the most common configurations together with other system solutions put together to suit individual needs.

## E-Sea Fix Ultra-Lite™

- FITS ANY AIS RECEIVER
- WIRELESS LAN CONNECTION OF ALL COMPONENTS
- SHOCK AND WATERPROOF TRANSPONDERS UNITS
- READY TO USE WITHIN FEW MINUTES
- UP TO 20 HOURS BATTERY OPERATION



Fig. 1



Fig. 2

The E-Sea Fix Ultra-Lite is the most simple and inexpensive in the comprehensive range of ECDIS tools for marine pilots.

The unique cylindric shape of the Ultra-Lite unit is very compact but in spite of its compact size it contains a battery, a Wi-Fi access point, an AIS adapter and optionally a 16 channel GPS receiver.

No pilot plug - no problem

The Ultra-Lite is provided in the following two versions:

- Ultra-Lite transmits data from AIS receivers pilot plug (.g. 1)
- Ultra-Lite-GPS transmits data from either a built-in GPS receiver or the AIS receiver (.g. 2)

In an ideal situation the Ultra-Lite is connected to the ships AIS pilot plug and the AIS data is transmitted to the pilots PC through Wi-Fi.

### No pilot plug - no problem

In cases where the AIS plug is not available or does not function for one or another reason, the Ultra-Lite GPS can be brought outside and placed e.g as shown on the picture and will transmit a position from the built-in GPS receiver.



Ultra-Lite GPS: Wireless data to PPU

# E-Sea Fix CAT

- CABLEFREE
- STRONG AND ROBUST
- EASY TO SET UP
- COMPACT SIZE



UHF transmitter  
 Wi-Fi access point  
 DGPS receiver  
 Battery



The main difference between the Ultra-Lite and the CAT is that the CAT can communicate with a shore base station.

This enables differential corrections to be transmitted to the CAT (UHF frequency).

It also allows the system to transmit its position back to the shore station enabling the shore station to monitor the activities of one or more ships that use the CAT system.

E-Sea Fix CAT is the simplest of the two systems and it uses only one transponder.

This transponder, however, is extremely compact. It contains a UHF transmitter, a DGPS receiver, batteries and a Wi-Fi transmitter.

E-Sea Fix CAT MAX is the top of the line cable free system. Adding 2 more units that operates on dual frequency GPS offers heading and dynamics to support the most demanding operations.

The CAT (Carry Along Transponders) configuration is the 100 % cable free pilot system.

E-Sea Fix CAT is the second generation of the original system from MARIMATECH, based on proven technology with over 50 installations around the world.

There are two systems available. The E-Sea Fix CAT and the E-Sea Fix CAT MAX.

E-Sea Fix CAT is based on a 16 channel DGPS receiver (EGNOS) and as all the other systems it is based on Wi-Fi technology.

## PDA

The PDA option is available with all the E-Sea Fix systems.

Often a notebook PC is not handy to use on the bridge wing at the last stage of the approach.

In that case a PDA with Wi-Fi interface is a handy device.

Needless to say that the amount of data of the PDA is limited compared to a notebook PC, so a dedicated program has been developed for presenting the key information on the compact PDA screen.

The PDA can be any standard PDA as long as the operating system is Microsoft Windows Pocket PC.



## E-Sea Fix Hybrid

- INTEGRATED AIS
- GOOD IN CRITICAL GPS AREAS
- ALL INSTRUMENTS IN ONE SYSTEM
- ALL ELECTRONICS PROTECTED IN THE BOX
- CAN BE SET UP ANYWHERE



PC  
 DGPS receiver  
 UHF transmitter  
 Access point  
 AIS receiver  
 Charger  
 Inertial Gyro  
 Battery



E-Sea Fix Hybrid MAX operating in a difficult environment.

E-Sea Fix Hybrid is a 'pilot in a box'. The GPS receivers are located inside the transport case - also when the unit is in operation.

E-Sea Fix Hybrid is a good overall compromise to the most demanding operations. The accuracy is not high enough for docking VLCCs but covers nearly all other operations. The hybrid has cables to antennas and the connection to the PPU is wireless LAN.

In its standard configuration the Hybrid is equipped with an AIS receiver. This means that AIS data are included on the Pilot's PC without hooking up to the pilot plug. So it means that the pilot does not have to spend time on finding a pilot plug and being dependent on getting it. The E-Sea Fix Hybrid is available in two versions.

The basic model is based on DGPS and the more precise model called Hybrid MAX is based on RTK DGPS (GLONASS, dual frequency) with an accuracy of a few centimeters and can be used for docking and the most demanding operations where accurate prediction is required.

The hybrid PPU solution reduces the pilot's stress factor from the pilot to a reasonable level, even to no stress at all. The pilot can concentrate on a single display, which he is totally confident and familiar with.

By using latest technology the system offers accurate and reliable information, and enables the pilot to work completely independent of the ship's equipment, which in most cases is far less accurate. Including sensors such as:

- Positioning system in 3 dimensions with centimetre accuracy operating on both GPS and GLONASS.
- Inertial gyro system which measures the ship's movement in the 3 axes, and in combination with the sophisticated GNSS, will position the ship even if the GNSS signals are lost or reduced in performance due to a difficult environment.
- Radio link that will connect ship with shore VTS for transfer of environmental real time data and VTS radar targets (if available)
- Integrated AIS receiver supporting the PPU with easy readings of AIS information (no need to connect to ship's AIS).



## Safety considerations

In Pilotage, the human element is the highest accident risk. A majority of accidents are related to human errors. An accident is normally related to a combination of several elements such as non-familiarity of ships equipment, multinational bridge team, or poor weather conditions. These three main elements may combine to lead directly to a worst case scenario. By removing one element out of these 3 basic elements the danger is reduced dramatically. The latest hybrid solution to the PPU (Portable Piloting Units) is a major lift towards safety, removing one key element.

## PC options and Software

Some pilots focus on the weight of the PC – the lower the better. For others reliability is more important. With the E-Sea Fix you are free to choose. Below we have shown some of the possible types of PC which can be used. The PC can be delivered by MARIMATECH or purchased locally.



Standard Notebook PC.  
Minimum resolution 1024 X 768 and Wi-Fi receiver or rugged pc with metal frame. Available with sunlightscreen. for training purpose.



Standard Tablet PC.  
Using a touch sensitive screen instead of keyboard.  
Alternatively a rugged model which is waterproof and protected against shock prediction.



Personal Digital Assistant (PDA).  
Standard PDA's can be used if they are equipped with Wi-Fi interface and Microsoft pocket operation system. Also available in Ex version



Transport cases can be either soft or hard types. The hard case weighs app 4,5 kg and offers very good protection. The soft case weighs app 1 kg but is more fragile.

## Software

The E-Sea Fix software is designed by pilots for pilots.

There are 3 main 'modes':

- Setup (of the ships data)
- Operation (ships navigation)
- Replay.

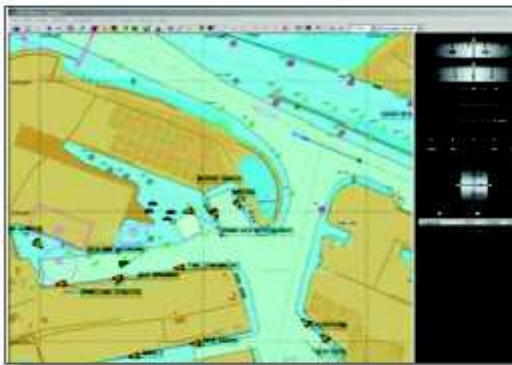
In operation mode the system can record the activities on the hard disk. In replay mode the recording can show what happened. This is very useful in case of any accidents or it can be used for training purpose.



Vessel prediction



Docking mode



AIS targets shown on the screen

## Additional equipment

### AIS integration.

AIS data is vital for pilots. The question is how to get easy access to it.

E-Sea Fix The Ultra-Lite(TM) can only receive it through a cable to the AIS pilot plug.

The E-Sea Fix CAT can get it through an AIS receiver located at the shore station.

The E-Sea Fix Hybrid has its own AIS receiver built in. It means that no hooking up to the ship is required at all.



### SPM / FPSO

The E-Sea Fix system is ideal for SPM and FPSO applications. The software is specifically designed to show the position and key information on both the portable PC and a stationary PC located at shore or on board the FPSO.



### Shore Station

The CAT and Hybrid systems are equipped with UHF or VHF radios enabling them to communicate with a shore station. By use of a time slot system (TDMA), different kind of data can be transmitted to the pilots.

Typical information is:

- differential corrections
- Tide and other EMS data
- VTS data
- radar targets
- other E-Sea Fix ships

By connecting a PC to the shore station it can monitor all E-Sea Fix systems in the area.

Also short messages can be sent between the E-Sea Fix and the shore station.



Shore Station

### WiFi versus bluetooth

The name Bluetooth origins from a Danish king (Blaatand) and it is the latest technology developed specifically for wireless communication between electronic devices on short range.

So it was natural to use Bluetooth for communication between the PC and the transceiver(s).

However, the result we got from testing this technology was not satisfactory and we ended up with the WLAN (Wi-Fi) wireless standard. The main advantage is the longer range of the WLAN. It can communicate on distances up to 300 meters.



VS



## Product Overview

		CHARACTERISTICS					
		Position based on	Heading	Cables	AIS Data	Link to Shore Station	
<b>ULTRA LIGHT</b>		Ships GPS through the AIS pilot plug	Ship AIS (Gyro)	To ship AIS plug	Yes	No	
	<b>GPS</b> 	16 Channel DGPS (Egnos)	Course over ground or gyro from ships AIS	No or cable to ships AIS plug	No	No	
<b>CAT</b>		16 Channel DGPS (Egnos)	Course over ground	No	No optional via shore station	Yes	
	<b>Max</b> 	2 x 24 Channel L1+L2 RTK DGPS	DGPS dual antenna	No	No optional via shore station	Yes	
<b>HYBRID</b>		2 x 12 Channel DGPS RTK (Egnos) and inertial system	DGPS dual antenna	To 2 x antenna	Yes (integrated AIS receiver)	Yes	
		2 x 24 Channel L1+L2 RTK DGPS and Glonass and inertial system	DGPS/Dual antenna and inertial (gyro)	To 2 x antenna	Yes (integrated AIS receiver)	Yes	

## Product Overview

SPECIFICATIONS			APPLICATIONS						
			Docking	Offshore Positioning	Navigation en route	Ship Trials	Harbour Manoeuvres	F50/F50Q/SPM	
Weight:	0,3 kg		No	No	Yes	No	Yes	No	
Size:									
Battery Capacity:	10 H (optional 20 H)								
Position:	From ships AIS								
Speed:	10 cm/sec (0,1 knots)								
Heading:	Ships gyro								
ROT:	Ships gyro								
Weight:	0,68 kg		No	No	Yes	No	No	No	
Size:	Ø = 50 mm, l = 245 mm						Yes, when connected to AIS		
Battery Capacity:	10 H (optional 20 H)								
Position:	< ± 6m, < ± 2 Egnos mode								
Speed:	10 cm/sec (0,1 knots)								
Heading:	Course over ground								
Weight:	2,5 kg		No	No	Yes	No	No	No	
Size:	155 x 155 x 95 mm								
Battery Capacity:	16 H								
Position:	< ± 6m, < ± 2 Egnos mode								
Speed:	< ± 0,5 m (DGPS)								
Heading:	10 cm/sec (0,1 knots)								
ROT:	Course over ground								
Weight:	10,5 kg (excl. PC)		Yes	Yes	Yes	Yes	Yes	Yes	
Size:	460 x 160 x 350 mm								
Battery Capacity:	16 H								
Position:	< ± 2 cm (DGPS)								
Speed:	± 0,5 cm/sec (0,01 knots)								
Heading:	0,07 dg RMS								
ROT:	± 0,15 dg/min								
Weight:	8,2 kg (excl. PC)		No	Yes	Yes	No	Yes	Yes	
Size:	460 x 160 x 350 mm								
Battery Capacity:	12 H (opt. 24 H)								
Position:	< ± 2 m								
Speed:	± 2 cm/sec (0,05 knots)								
Heading:	± 0,2 dg RMS								
ROT:	< ± 1 dg/min								
Weight:	8,8 kg (excl. PC)		Yes	Yes	Yes	Yes	Yes	Yes	
Size:	460 x 160 x 350 mm								
Battery Capacity:	10 H (optional 20 H)								
Position:	< ± 2 cm								
Speed:	± 0,5 cm/sec (0,01 knots)								
Heading:	0,07 dg RMS								
ROT:	± 0,15 dg/min								