Berthing Aid Systems

World leader in Maritime Pilot solutions

- Safe approach
- Cost Effective Solution
- Laser and GPS Combined System
- Long Range
- Black Box Capability
**Introduction**

— to a Laser Docking System (LDS)

The MARIMATECH Laser Docking System uses two lasers mounted on the jetty which measure distance to the side of the approaching ships and then calculates the speed and angle of the vessel. This information can then be displayed on a jetty mounted Digital Large Display (DLD), wireless devices such as handheld pagers or PDAs and on control room computer monitors.

The LDS can also be integrated with a Moor- ing Load Monitoring System (MLMS) and Environmental Monitoring System (EMS).

**MARIMATECH Experience**

MARIMATECH has delivered over 250 Laser Docking Systems worldwide over a period of more than 20 years. During this time an incredible amount of experience and knowledge has been accumulated, allowing MARIMATECH to remain at the forefront of innovation within the maritime industry. This experience allows us to offer the client first-class customer service and technical support, through our knowledgeable engineers and dedicated software department.

**System Benefits?**

- **Safety**
  
  High precision laser measurement and real-time updates on DLD and hand-held displays prevents accidents and fender damage due to excessive speed.

- **Reliability**
  
  Simple and robust design guarantees consistency as well as excellent performance in adverse weather conditions.

- **Precise**
  
  Laser technology is currently the most precise instrument to measure ship speed, distance and angle.

- **Long range**
  
  Lasers can start measuring from a distance of up to 300 metres.

- **Cost effective**
  
  Minimum maintenance and long product life make for a cost effective solution.

- **Complete system integration**
  
  High-quality LMS4 units and reliable software allow for integration of EMS and MLMS.
**Lasers**

**Laser**

All MARIMATECH lasers are certified for Hazardous Zone 1 EEx installation and are Class 1 eye safe. Depending on the application lasers can start measuring from 100-300 metres and can be in stainless steel or aluminium housing. The lasers should be mounted with a minimum spacing of 25 metres and maximum depending on the size of the vessels. Typically the lasers are installed on the side of the jetty or in a location where they don't interfere with the jetty operation and yet easy to access for cleaning.

**Laser Telescope**

MARIMATECH offers several elevator systems (telescope) for the lasers in case of large variations in tidal difference. The elevators make sure that the laser never comes into contact with seawater, so ensuring reliable measurements. Should the power fail, the gear motor is fitted with an emergency clutch making it easy to lift the telescope manually. These are available both as manual and electronic versions.

**Laser Tracker**

MARIMATECH supplies a Laser Tracker as an efficient alternative to a telescope solution. Using the built-in intelligent tracking software the laser can handle all ship sizes and any tidal variations. In addition to being a cost-effective solution, the Laser Tracker requires minimal maintenance and saves space. Please note that this solution cannot be installed close to the ship. Minimum distance must be 10 meters.

**Laser Installation**

The MARIMATECH lasers are supplied with a standard mounting bracket, which allows numerous different configurations, meaning that it can be installed almost anywhere on the jetty. You will notice different examples throughout this brochure.
The MARIMATECH DLD shows the data being collected by the laser units and is visible to the pilot from approximately 250 metres day or night. The DLD can show speed, distance and angle and using “speed arrows” the pilot can also see whether speed is increasing, decreasing or constant. Three speed warning lamps - green, amber, red - indicate if approach speed is safe.

The DLD can be mounted on support legs ranging from 1-4 metres, which are designed to be able to withstand wind loads of up to 60 m/s (optional). The DLD does not require instrument air and needs minimal maintenance.

The DLD can be supplied with an electronic turntable with a rotation angle of 330° which is controlled locally or remotely. The DLD is also available with an optional approach angle display mounted on top.

MARIMATECH also offers a DLD Lite, visible from 175 metres, which is a smaller version of the standard DLD. The Lite can be mounted on a traditional support leg or using a bracket it can be mounted on a variety of structures ranging from buildings to a suitable jetty steel construction such as the gangway tower.
**System Computer**

**PC**

MARIMATECH supply a standard high quality robust rack console with front and rear access, which can house a 19” monitor, computer, printer, QRH remote release and several LMS4 units.

The control room PC can be supplied to the exact specification of the client. With MARIMATECH’s LMS4 system the desktop PC is predominantly a viewing tool with report printing facilities, furthermore the PC will store reports for as long as the client requires. Using the LMS4 as a building block the MARIMATECH system does not depend on the PC and should the PC go down during the approach, the system will continue to work and data will be stored using LMS4 built-in memory. This makes the system very reliable and safe.

Work station PCs can be added to the system and more operators can use the system simultaneously. Note that with the above described system structure the MARIMATECH LDS system can be delivered without a PC.

**Pager / PDA**

MARIMATECH’s intrinsically safe pagers and PDAs can be crucial to safe berthing operations. Using UHF frequencies these devices can show approach, MLM and EMS data.

The range of the pagers is up to 2-3 km and the PDAs (using Wi-Fi technology) is roughly 200-300 metres.

**DockMaster Display**

The DDM 647 and DDM 12 displays are designed for installation near the jetty berthing line as a support display for the dockmaster during berthing operations. The displays will indicate berthing data such as speed, distance and angle of vessel bow and stern relative to the fenders. Displays are also capable of integration with EMS data.
System Overview

- Long Range Laser
- Wave and Tide Laser
- Computer Rack
- Large Display Board
- LMS4 Junction Box
- Current Sensor
- PDA
- Weather Station
**SOFTWARE/REPORTS**

**SOFTWARE / REPORTS**

The MARIMATECH Dockmaster version 5.0 is the latest version of the standard application software for the LDS systems. It is a configurable standard program developed by MARIMATECH engineers and can be scaled from a small system with 2 lasers and one large display to a multi terminal system with 5 or 6 terminals and 50+ LMS4 units. The Dockmaster 5.0 contains a designer package which is used by the MARIMATECH to 'customize' the system to the individual user requirement. This is done without changing the kernel program and by using this structure the software can easily be upgraded and supported.

The software is divided into different sub-programs: One is controlling the berthing, one is controlling the mooring and the last sub-program controls the EMS.
WAVE AND TIDE LASER Sensor

MARIMATECH’s wave and tide laser is optimised for all weather wave height and wave spectrum measurements, while also providing tidal information. The laser technology allows measurement through steam, snow, rain and water spray.

CURRENT SENSOR

The sensor uses the Doppler Shift principle as the basis for its measurements. The sensor transmits acoustic pulses into the surrounding water and will output Current Speed, Current Direction and Water Temperature where Current Speed and Direction are averaged values.

WEATHER SYSTEM

This multi-sensor instrument can measure up to six of the most essential weather parameters: wind speed and direction, liquid precipitation, barometric pressure, temperature and relative humidity. It is completely configurable allowing it to match any user requirements. With no moving parts and resistance to UV radiation, minimal maintenance is required.

MLM

MARIMATECH can supply a complete berthing system incorporating Mooring Load Monitoring. This means that all data are stored in the same database and can be printed on the same reports.

PORTABLE PILOTING UNIT (PPU)

MARIMATECH’s E-Sea Fix CAT system can act as an alternative or supplementary tool to the traditional laser based solution. MARIMATECH provide 3 different unit options and the most accurate unit, the CAT III, has a positional accuracy of 2 cm and heading accuracy to 0.02 of a degree.
The LMS4 system is a compact yet powerful interface unit with both processing power and storage capacity. The LMS4 units facilitate for reliable communication between, for example, lasers, large displays, quick release hooks and weather sensors. By utilizing the embedded software, the LMS4 modules can bring bespoke functionality into the system, making them independent of a master PC. The storage facility of the LMS4C modules allows them to store data (PCMCIA and normal memory) which can function as back up for the master PC, in case the PC should stop functioning, making them the perfect platform for building integrated systems.

The system combines Ethernet and RS485 technology to create a robust and flexible system, with almost endless possibilities. It is a decentralized system, where the traditional master PC is changed to a thin client PC acting as a viewer; this means that the LMS4 system can continue to function even if other parts of the system are powered off or malfunctioning.
MARIMATECH – World-wide Sales and Service

MARIMATECH are represented with sales agents in more than 35 countries and a world-wide service net in 44 countries. All our agents are well known with our products and are frequently updated on new solutions. Sales and technical seminars are held on a regular basis for our agents on our service stations in Europe, America, and Asia. Please check our website for current listings of world-wide sales agents and service stations.

We ensure performance after installation once the system is installed and is in operation MARIMATECH’s service and support staff is here to help in case of any questions. This can be done on an ad hoc basis or by choosing one of the service products we offer. Although the quality of the equipment is first class, and we have done everything we can to bring the maintenance down to a minimum, we recommend a preventive maintenance agreement in order to prolong the lifetime of the system.

Full scale service and maintenance available MARIMATECH can assist our clients by providing customised service and maintenance such as:

- Maintenance agreements
- Spare parts, including discontinued spare parts and a complete spare parts inventory
- Hot-line help line up to 24 hours
- On-line support via modem or internet connection
- Guaranteed service response on-site within 10 days

MARIMATECH AS
Samsovej 31
DK-8382 Hinnerup
Denmark

Tel:    +45 86 91 22 55
Fax:    +45 86 91 22 88
Email:  mail@marimatech.com
Website: www.marimatech.com

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