Since our founding in 1946, Musasino has been a specialized marine equipment manufacturer serving the changing needs of our customers.
The electro-magnetic float type level gauge we developed rose to the top* global market share for liquid level gauging on tankers, according to internal research.
Building on the level gauge and digital technologies we have developed over the years, we aim to digitalize commercial vessels. We continually challenge ourselves.

A globally trusted company

*1 Liquid level gauge system for tankers, market share 2023 (according to internal research)

MUSASINO CO., LTD.

□Head Office
1-2-15 MinamiYukigaya, Ota-ku, Tokyo, 145-0066
Tel.＋81-3-3726-4413　FAX.＋81-3-3726-1557
E-mail：sales@musasino.co.jp／service1@musasino.co.jp

https://www.musasino.biz

Distributor:

2d08-2-000-A

LEVEL MASTER

Pulse Purge Type Level Gauge

LAX

Flooding Detection and Tank Level Gauging System

MUSASINO CO., LTD.

Key Components of the Musasino Smart Network

LAX Pulse Purge Type Level Gauge

Reliable measurements for safer, ship-friendly cargo operations

Reliable ballasting, promoting ship data to IoT, and reducing the crew's workload

"We are uneasy about the accuracy of the ballast tank level and draft gauging…" Quite often, during cargo operations, these measurements are done by manually or visually. To alleviate the unease and help reduce the workload, we propose the Musasino Air Pulse type liquid level gauge, with the highest accuracy in the industry. Its versatility and easy installation mean it can be used on a wide range of ship types and various types of tanks at the same time.

MPP-Unit (Multi Pulse Purge-Unit)

1 High Accuracy Pulse Purge Type Level Gauge ±25mm corresponding to Level Master

Musasino's patented pulse purge method L-Core takes high accuracy measurements. Temporarily discharging a higher pressure of compressed air, and stopping the air flow during measurement, eliminates the pressure loss and fluctuation, allowing for high accuracy measurements. This method suppresses hysteresis, and results in high-precision liquid level measurements.

Accuracy

LAX-PH Ballast Tanks, Fuel Tanks, Draft Gauges, Flood Level Gauge	±25mm
LAX-WAC Fresh Water Tanks, Engine Room Tanks	±25mm

2 Use also for Loading Plans From level measurements in a variety of tanks to flooding alarms

From so-called 'placement tanks' in engine rooms, to ballast tanks and water ingress alarms, High accuracy that directly connects to a loading computer, and can be used for loading plans. By determining the alarm point from the level measurement, it can also be used as an alarm device.

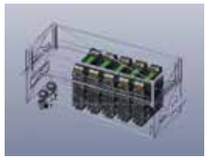
3 Automatic Atmospheric Pressure Correction (patented) & Temperature Compensation
Self-correcting for high accuracy measurements

Another feature that results in high accuracy measurements is the self-correction function. An atmospheric pressure reading is taken regularly, and in the pulse purge method a zero point correction is made when the airflow is stopped. As a result, there is no restriction on where the unit can be installed, and errors due to aging of the pressure detector are prevented, so that stable, high accuracy measurements can be made over the long term. Because temperature may also affect the pressure sensors measuring liquid level, temperature compensation is also done.

Module (MIU) Developed in-house Easily Acquire a Wide Variety of Signals

MIU
(Multi interface unit)

MIU is a proprietary interface, developed to capture all of a ship's data. The unit consists of a series of nodes that enable acquisition of various types for signals – analog, serial, contact, LAN, etc. By combining various nodes corresponding to the types of data required, managing cargo handling-related equipment such as monitoring and control systems – including third party systems – can be integrated.



Easy Connection of LAN Signal Outputs

Ballast tank and draft information is necessary for loading plans and control of the ship. LAX can send measurement information directly to a loading computer via LAN signal, which contributes to finer and safer hull control.

Reduce Cabling

The rack type has a simple exterior structure, and can be installed at various locations on a ship, allowing for a reduction in the amount of cabling required. In the past, control devices required cabling all the way up to the machine room. The MIU reduces and simplifies cabling by connecting at a closer point, and using a LAN cable to network with the central control. The result is a significant reduction in the amount of cabling required.

Specifications

Measurement Method	Pulse Purge type
Power Supply	AC100～220A
Accuracy	±25mm / LAX-PH, LAX-WAC
Protection Class	MPP-Unit : IP44/Alarm Panel : IP22
Air quality	Dry air for measurement
Ambient Temp. Range	5～55°C (MPP-Unit / Alarm Panel)
Interface	LAN, RS485
Classification Approval	ABS, BV, CCS, DNV-GL,KR,NK

Various Detectors to Match the Applications

TOP-MOUNT type purge head installed on the top of the tank,WAC purge head that does not discharge air to the tank for drinking / fresh water tanks and E/R storage tanks in the E / R, and the immersion alarm device ADM that can measure two points with one unit, are available according to the application.

LAX-PH

Simple structure & maintenance-free

Accuracy: ±25mm
Applicable Tanks:Ballast Tanks, FO/DO Tanks, Draft Gauges

LAX-WAC

Diaphragm type, measurement without bubbles

Accuracy: ±25mm
Applicable Tanks: Drinking Water, Fresh Water, Settling Tanks, Storage Tanks, Service Tanks, Other Engine Room Tanks

Water Ingress Alarm

Fail safe function, liquid level measurement even after an alarm

Accuracy: ±30mm
Application: Ingress Alarm, Bilge Alarm

The industry's first liquid level gauge and alarm controller to use a pulse purge method. L-CORE supports cargo operations, hull monitoring, and management.

Cargo Operations Support

Combining LAX (high accuracy level and draft gauges) with software supporting various cargo operations, Musasino systems support quick and accurate cargo operations, while reducing the crew's workload.

Ship Management Support 1

High accuracy level gauging for optimal ballasting supports fuel efficiency improvements. In addition, the stress on a ship's hull is monitored and recorded in real time to visualize the operational conditions of the ship.

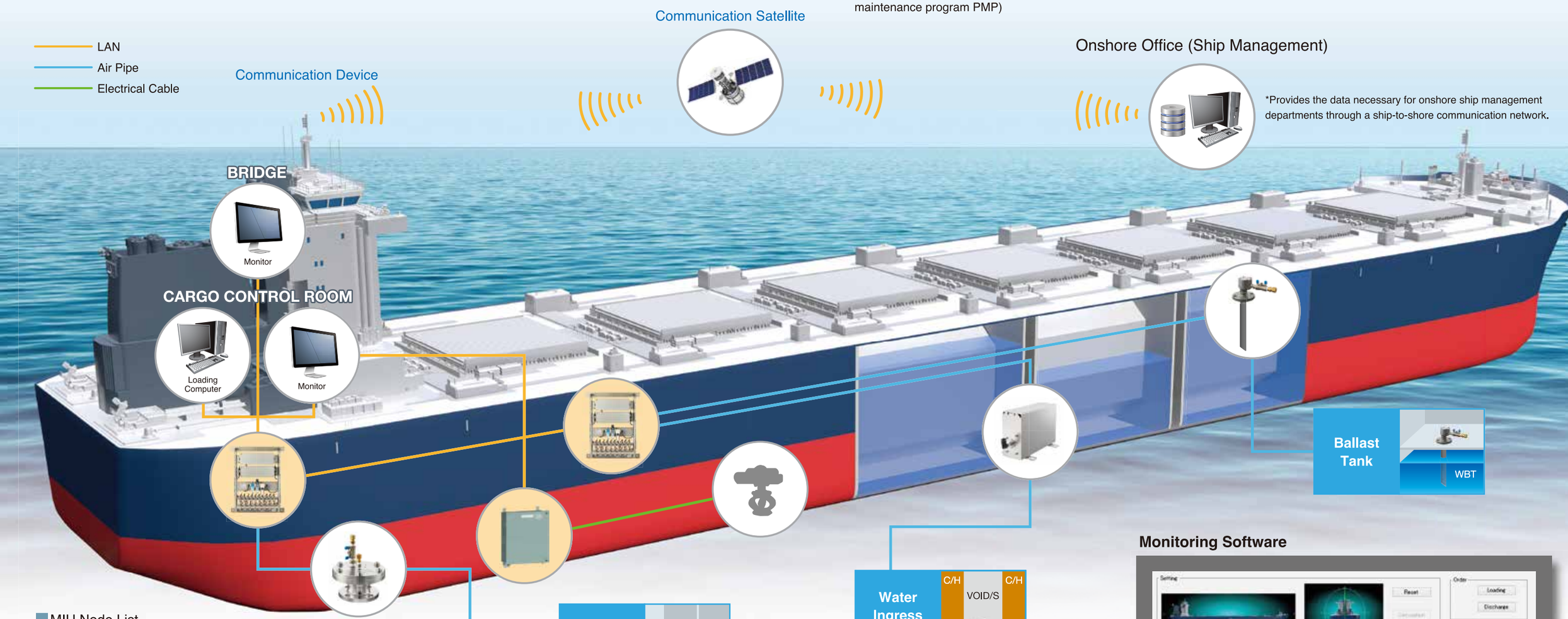
The multi-interface unit (MIU) can capture any type of signal to support ship digitalization.

Ship Management Support 2

LAX is equipped with a self-diagnostic function (comparing newbuilding data with current conditions), which constantly monitors and records device statuses. This database can be used to provide an efficient maintenance plan. (Musasino maintenance program PMP)

Ship Management Support 3

Various data from the ship is collected to build up a data base to provide the onshore management office with the data they need. The database can also be used to develop and provide various applications.



MIU Node List

Name	Function	Input	Output
MIP-SB2	Current Serial – LAN Signal Converter MAX10ch	LAN Current Serial	Current Serial LAN
IP485	Signal Converter MAX1ch	LAN RS232 RS485	Current Serial RS232 RS485
MIF-CO2	Annunciator Function Valve Control Function MAX24ch	RS485	Open Collector
MIF-C2	Contact – Serial Converter MAX24ch	Dry Contact	RS485
MIF-AV	Analog Input Serial Converter MAX16ch	Voltage 4-20mA	RS485
MIF-SO	Serial Input Analog Output MAX8ch	RS485	4-20mA
VCON	Control Device for Valve Opening Max. 4 units	RS485 Dry Contact	Open Collector
Terminal module	Valve Forced Control Function Signal Converter	Digital Signal	Valve Control Signal
RBU	Dry Contact Output (isolated) Max. 24 Contacts	Open Collector Dry Contact	Dry Contact (isolated)

Application Software List

Cargo Operations Support	·Cargo Operation Support Voice Guidance ·Software MIMIC (error prevention & operation playback function) ·Auto Trim/Heel
Ship Management Support	·Strength Calculation Data Output
Maintenance Support	·Remote Maintenance ·Device Test Guidance

Preventive Maintenance Program (PMP)

PMP is a program to provide optimal preventative maintenance services based on a database built with by the self-diagnostic function installed in our system.

Monitoring Software