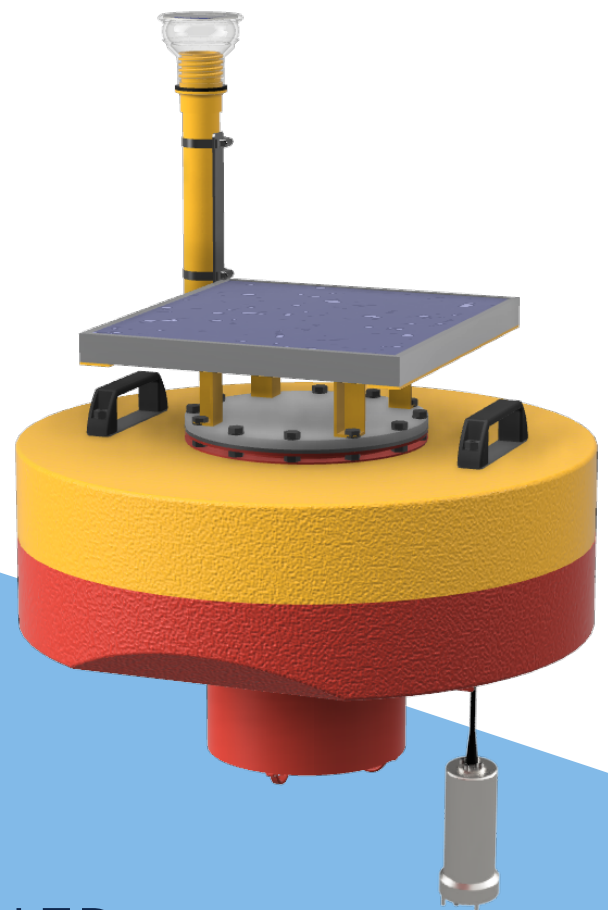


Perceive about "the now" of the distant ocean
Water Quality Telemeter System



NISHIMURASYOKAI CO., LTD.

Water Quality Telemeter System “umihal” is a device for constant monitoring of water quality.

The data observed at regular intervals can be checked in real time on the website.

The water quality of aquaculture farms can be monitored numerically by installing the system, enabling quantitative judgements that do not depend on conventional intuition or sensory perception.

Moreover, “umihal” is also effective in taking measures against red tides. Red tide, caused by plankton blooms, is a serious threat to farmed fish. Damage is reported every year, sometimes not only to aquaculture farming, but also to natural marine resources.

Although there are various methods to reduce red tide damages. In the aquaculture industry, early action is effective for all methods.

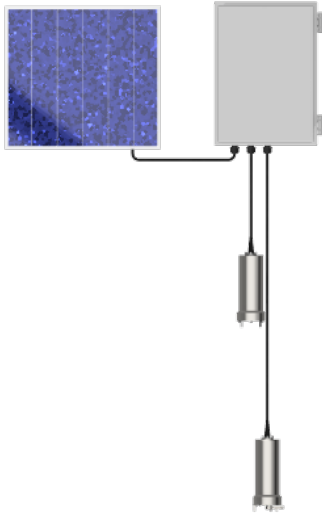
The “umihal” can capture onset, inflow, outflow, and convergence of red tides, hence firmly supporting early countermeasures.

Telemeters that are Suitable for Various Places

We offer three types of telemeters that can be installed in any location.

NI-TEBX

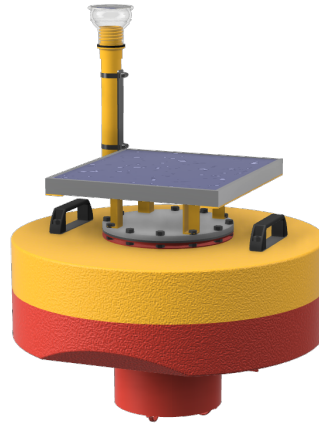
Basic box type



It can be operated in various locations such as the facilities of land-based aquaculture, relatively calm inner bays and lakes. It is possible to install the device anywhere as it is separate from the solar panel.

NI-TEBY3

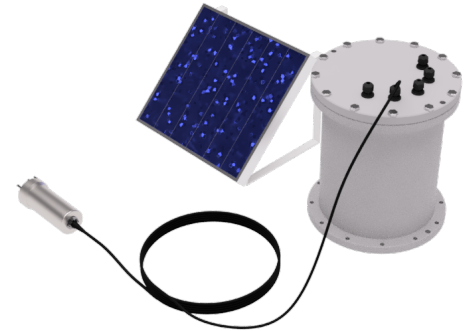
The buoy type makes it possible to monitor where there is no platform



The telemeter can monitor from any location even without a platform since it is a buoy itself.

NI-TEBN

High-durability and pressure tight device that can be installed up to a depth of 20m for one year



The pressure-tight telemeter made of Polyvinyl Chloride (PVC) can be set on the sea floor and monitor from the same location.

Model	NI-TEBX/TEAC	NI-TEBY3	NI-TEBN
Channel	6ch+1ch(water depth sensor)+GPS		
Monitoring interval	10min, 15min, 20min, 30min and 60min		
Communication	4G LTE		
Charging Equipment	The single crystal solar panel 15W (Output changeable)		
Power Source	12V LiFePO4 battery (TEAC is AC100V)		
Dimensions	H approx.35cm x W approx.25cm x D approx.15cm (Excluding solar panel)	H approx.70cm x φ approx.50cm (Including solar panel and beacon light)	H approx.37cm x φ approx.32cm (Excluding solar panel)
Weight in Air(except sensor)	approx.15kg/7kg	approx.25kg	approx.25kg
Material	Main Body : ABS	Main Body : SUS430 Floating Body ESP	Main Body : PVC
Waterproof Performance	IP65	Equivalent to IP68 (water depth of 10m/ 5hours)	Equivalent to IP68 (water depth of 20m/ 1year)
Additional Equipment	-	Type L-3 Beacon Light	-
Continuous Operation Time without Charing	7days (Case of monitoring interval 30min and 1 connecting sensor)		

Introduction Experiences

An example of NI-TEBX



Installation location: A fish farm

Observation items: water temperature, chlorophyll fluorescence, dissolved oxygen and harmful red tide(FSI)

Purpose of use: Installed for control of physical condition farmed fish and early detection of red tides. Additionally, used to warn of the harmful species by utilizing the harmful red tide plankton sensor.

An example of NI-TEBY3



Installation location : A site of port construction

Observation items: water temperature, turbidity, salinity dissolved oxygen, current flow and velocity

Purpose of use: Monitor turbidity for civil engineering works. The buoy type can be used when there is no structure at the observation point.

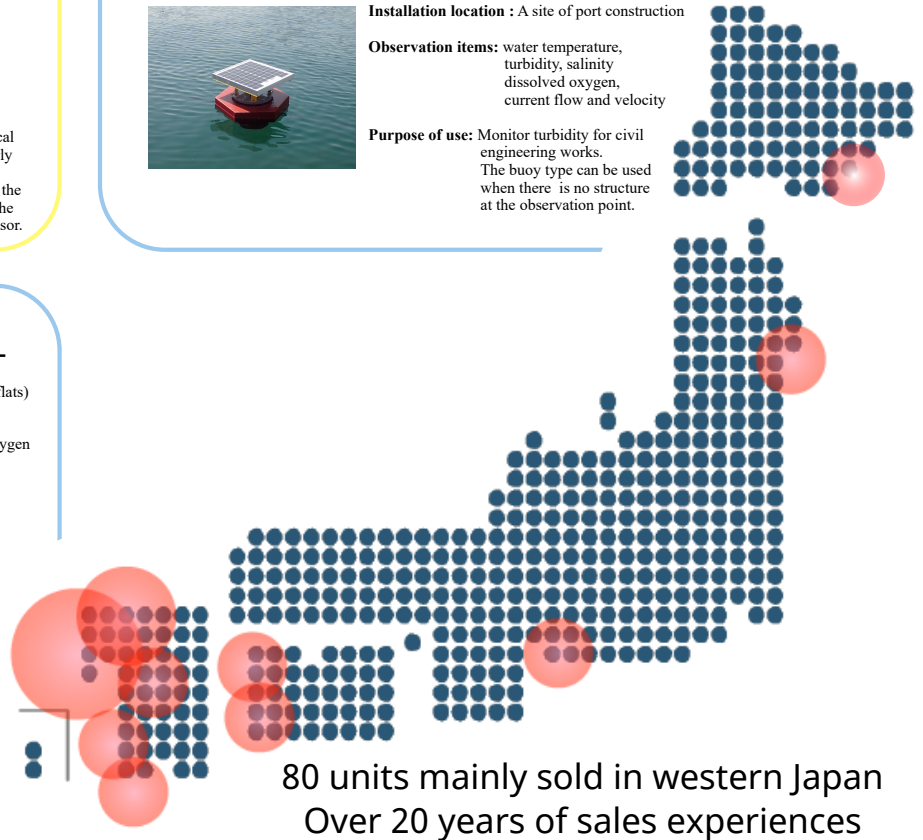
An example of NI-TEBN



Installation location:
The sea floor of Ariake sea (tidal flats)

Observation items: water temperature, salinity, and dissolved oxygen

Purpose of use: Check for deoxygenation and monitor the environment. The telemeter itself is set on the sea floor for one year

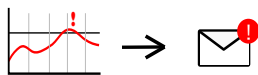


80 units mainly sold in western Japan
Over 20 years of sales experiences

Features of "umihal"

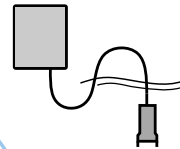
Notification mail

Threshold values can be set for each monitoring item.
Alarm emails are sent to the registered destination when threshold values are exceeded.



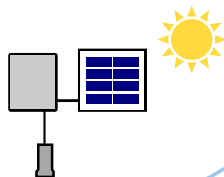
Many concurrent connections available

Up to 7 sensors can be connected, also it can be set up to monitor items and water depth.



No external power supply required

Equipped with a solar panel, there is no need to prepare another power supply.
Long-term observation is also possible.



Data is auto-saved to the server

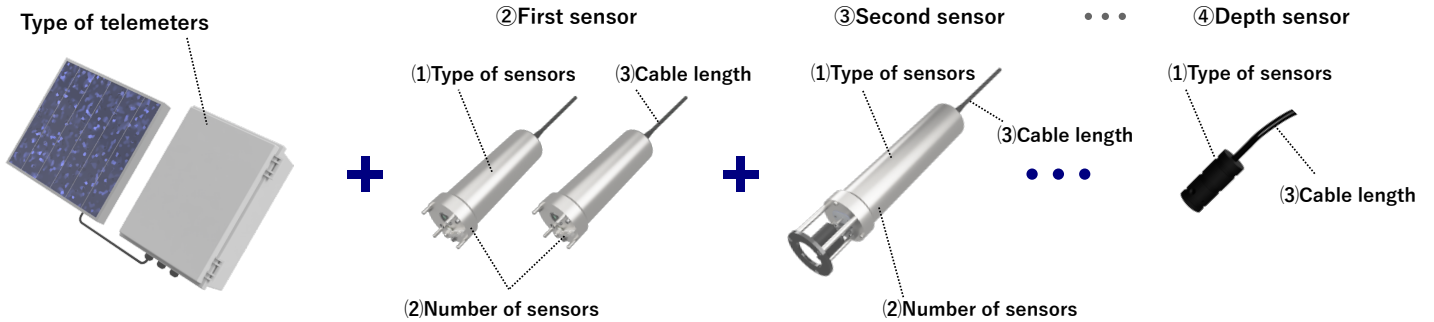
The observed data is automatically uploaded to the server.
Current observation values can be checked at any time on the website.



Selection Guide

Selection examples

① NI- **TEBX** - (1) **L** (2) **2** - (3) **20** - (1) **T** (2) **1** - (3) **20** ... (1) **D** (2) **10**



① Types of telemeters

TEBX	TEBY3	TEBN
Standard	Buoy	High Durability

(2) Length of the cables

Select the length of cable from 1m to 20m(20m, Standard)

Ex: To order 10m, write 10 **10**

(1) Types of sensors

L Temperature, Chlorophyll and Turbidity ACLW-CAR/CAD JFE Advantech	E Temperature, Current Flow and Velocity AEM-CAR/CAD JFE Advantech
T Temperature and Conductivity ACTW-CAR/CAD JFE Advantech	H Temperature and Chlorophyll,FSI AHIW-CAR/CAD JFE Advantech
R Temperature and DO AROW-CAR/CAD JFE Advantech	④ D Temperature and the water depth NI-SD NISHIMURASYOKAI CO., LTD.

Connectable sensors

Wired Chlorophyll and Turbidity Sensor



Measurement items	Chlorophyll	Turbidity	Temperature
Sensor Type	Fluorescent Measurement	Infrared Backscatter	Thermistor
Range	0~400ppb (Uranine reference)	0~1,000FTU (Formazin reference)	-3~45°C
Resolution	0.01ppb	0.03FTU	0.001°C
Accuracy	Non-linearity±1%FS (0 to 200ppb)	±0.3FTU or ±2%	±0.02°C (3~31°C)
Dimensions	φ70mm×173mm(Excluding cable)		

Wired Temperature Salinity Sensor



Measurement items	Temperature	Conductivity
Sensor Type	Thermistor	7-electrodes type
Range	-3~45°C	0.5~70mS/cm※
Resolution	0.001°C	0.001mS/ c m
Accuracy	±0.01°C (0~35°C)	±0.01mS/ c m
Dimensions	φ70mm×285mm(Excluding cable)	

Wired DO (Dissolved Oxygen)



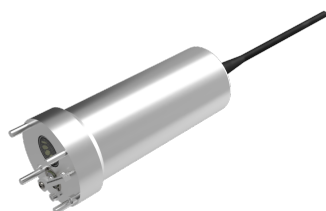
Measurement items	DO	Temperature
Sensor Type	Phosphorescence Measurement	Thermistor
Range	0~200%	-3~45°C
Resolution	0.01%	0.001°C
Accuracy	Non-linearity±2%FS	±0.02°C(3~31°C)
Dimensions	φ70mm×173mm(Excluding cable)	

Wired Current Flow and Velocity



Measurement items	Velocity	Direction	Temperature
Sensor Type	Dual-axis Electromagnetic Induction	Hall Element	Thermistor
Range	0~±500cm/s	0~360°	-3~45°C
Resolution	0.02cm/s	0.01°	0.001°C
Accuracy	±1cm/s or ±2%	±2°	±0.02°C(3~31°C)
Dimensions	φ54mm×381mm(Excluding cable)		

Wired Harmful Plankton Sensor



Measurement items	FSI	Chlorophyll	Temperature
Sensor Type	Fluorescent Intensity Ratio Measurement	Fluorescent Measurement	Thermistor
Range	-	0~400ppb (Uranine reference)	-3~45°C
Accuracy	Repeatability±0.05 (0 to 200ppb)	Non-linearity±1%FS (0 to 200ppb)	±0.02°C(3~31°C)
Dimensions	約φ70mm×176mm(Excluding cable)		

The Harmful Plankton Sensor is a sensor released by JFE Advantech Co., Ltd. It can identify two phytoplankton species, *Karenia mikimotoi* and *Chattonella antiqua*/Marina, which are well-known to cause harmful red tide. This sensor is expected to reduce the damages caused by red tides. Our company is the first to incorporate the telemeter systems in Japan, and has achieved a number of positive results.

Data Processing and Auto-upload for Website

It automatically processes the email data of received observations, creates graphs and tables, databases, CSV files, and uploads them on the web server.

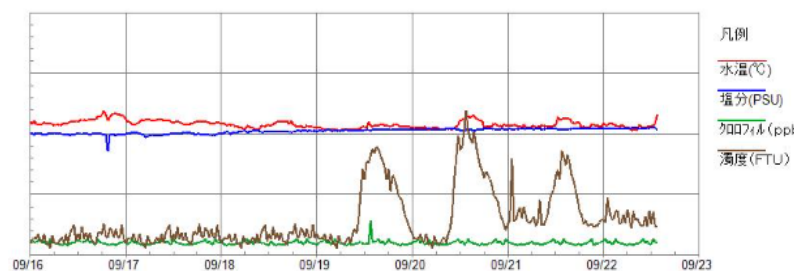
umihal sample page

観測水深 : 1.5m

・現在の観測値

2021/09/22	10:30	11:00	11:30	12:00	12:30	13:00	13:30
水温(°C)	25.5	25.6	25.6	25.7	25.7	25.9	26.6
クロロフィル(ppb)	0.96	1.19	0.90	0.92	1.34	1.04	1.02
濁度(FTU)	0.79	0.59	0.91	0.63	0.89	0.58	0.60
塩分(PSU)	31.4	31.4	31.5	31.5	31.5	31.5	31.1

・観測値の推移



(<https://telemeter-area.jp/sample/>)



NISHIMURASYOKAI CO., LTD.

Our company not only sells the telemeter systems, but also offers installation and maintenance of the devices. We also develop custom-made telemeter systems, manufacture special parts for the monitoring of water quality such as adhesion reducing covers for the sensors by using a 3D printer, and undertake marine observation survey and water sampling.

Should you have any questions, please feel free to contact us.

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