



## Custody Transfer System For LNG Bunkering Vessels



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# Custody Transfer System For LNG Bunkering Vessels

Musasino’s Custody Transfer Systems for LNG bunkering vessels pack extensive experience in the marine industry and unique technologies into an all-in-one structure, using a one-inch radar guide pipe.

## FEATURES

### 1 Unique Self-Correction Function

The radar type liquid level sensors are equipped with a self-calibration function that ensures accurate measurements over long-term operation.

### 2 All-in-One Structure

The all-in-one design combines modules for level sensors, temperature sensors, and pressure sensors in a single housing. Each module is independent, and can be maintained without having to open the tank. Musasino’s in-house developed transducer makes it possible to take stable measurements with less attenuation and less interference from any unevenness in the guide pipe.

### 3 Japan’s First Natural Gas Calorific Value Calculation Software

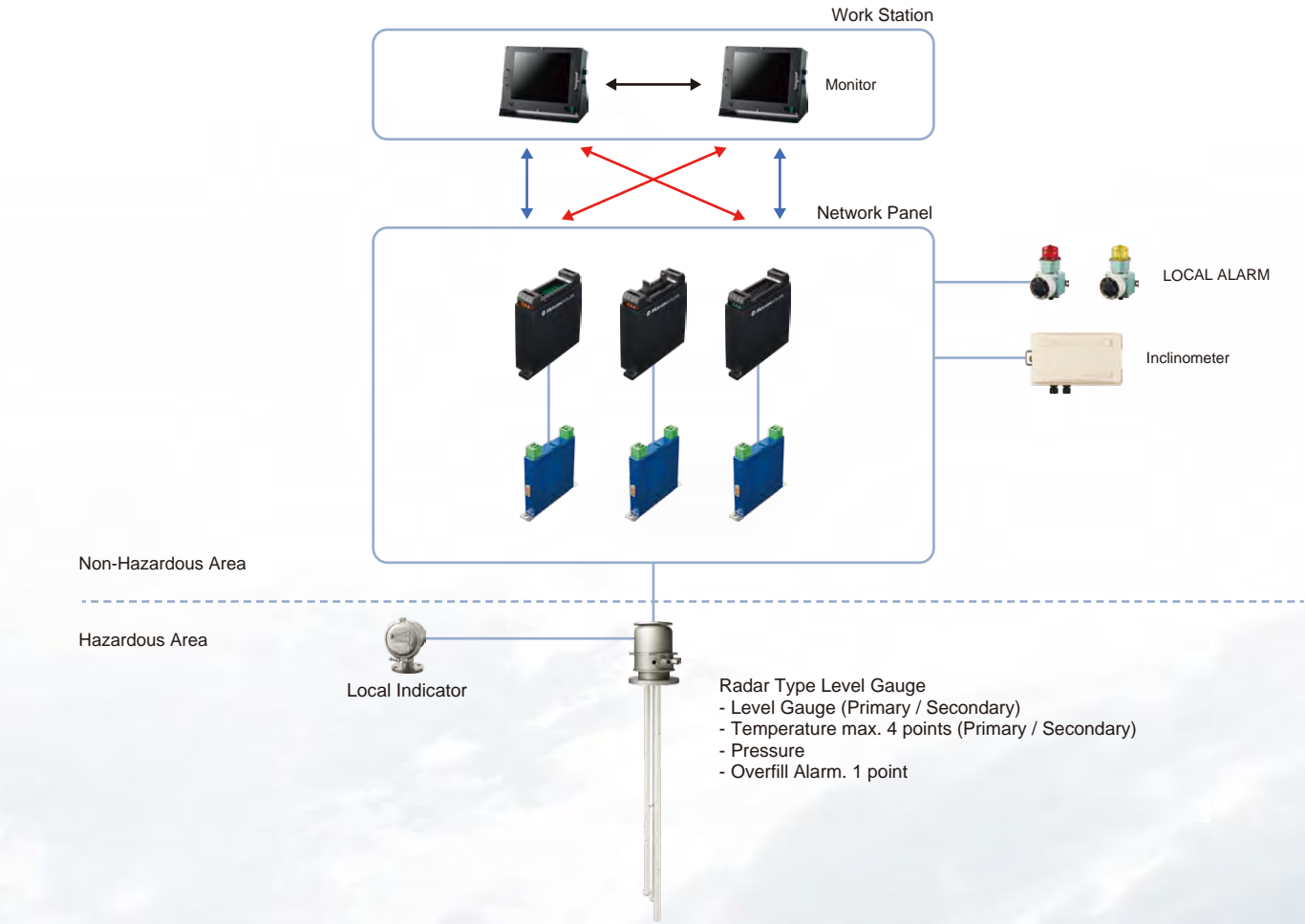
The software uses various data from custody transfer system reports and LNG composition to calculate the volume of natural gas into its calorific value, which is output in the Bunker Delivery Note.

### 4 Bottom Structure

The bottom attenuator has unique and simple design, which, depending on the tank type, can be installed directly on the guide pipe to eliminate the need for extensive installation work inside the tank.

### 5 Designed for Durability

The inside of an LNG tank is a harsh environment, and the installation has to hold up under those conditions for decades. Simulations using sloshing models show our design is robust enough to withstand over 40 years of operations.



#### Level Gauge

Measuring Method	FMCW (Frequency Modulated Continuous Wave)
Measurement Range	0.5m ~ 25m
Resolution	1mm
Accuracy	±5mm
Ambient Temperature	-30 to +70°C (Electronics Housing)
Explosion Protection	Intrinsically Safe Type Ex ia IIC T5
Protection Class	IP66
Material	SUS316L

#### Inclinometer

Method	Capacitive MEMS Sensor
Measurement Range	±5°
Accuracy	±0.05°
Resolution	0.001°

#### Temperature Sensor

Method	PT-100, 4-wire Temperature Sensor
Measurement Range	-200 to +100°C
Accuracy	±0.2°C (≤-145°C), ±1.5°C (>-145°C)
Resolution	0.1°C

#### Pressure Sensor

Method	Diaphragm with Strain Gauge Bridge
Measurement Range	0.8 bar ~ 4.6 bar
Accuracy	±0.5% FS
Resolution	1 mbar
Diaphragm Material	SUS 316L