

Equipment Vibration Monitoring iSN Series Vibration Sensor



Vibration
Indicators

Integration of Critical Vibration Data

Provide acceleration, velocity, displacement, FFT spectrum values, etc.

Support Modbus Protocol

Easy integration with application software and SCADA analysis.

Integrate IEPE/MEMS Accelerometer

Choose according to the application environment to meet various needs.



iSN-700 Series

Features

The iSN-700 series is a vibration detection device that allows users to monitor the vibration status of their equipment by selecting either an external IEPE accelerometer or an built-in MEMS accelerometer, depending on their needs. The modules support Modbus RTU or Modbus TCP protocols that can be used to read the computed Eigenvalues and FFT spectral values through Modbus commands for subsequent vibration data analysis.

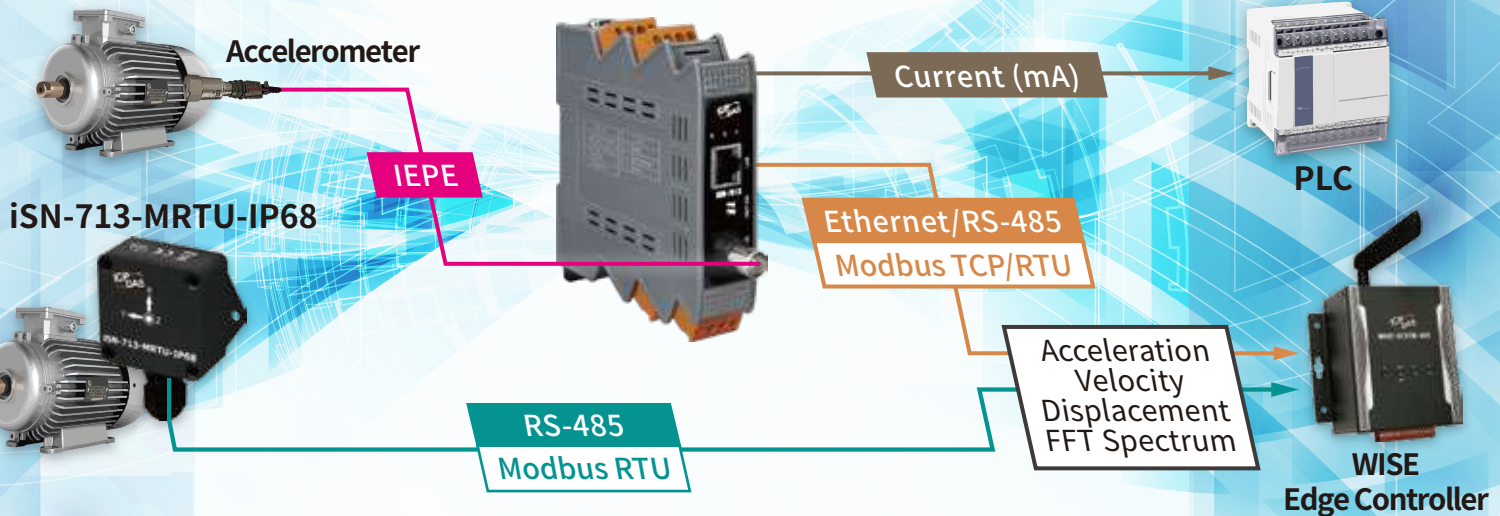
Multiple Accelerometer Options

IEPE Interface / Built-in MEMS

Data Format

Provides Acceleration, Velocity, Displacement & FFT Spectrum

iSN-701X-mA



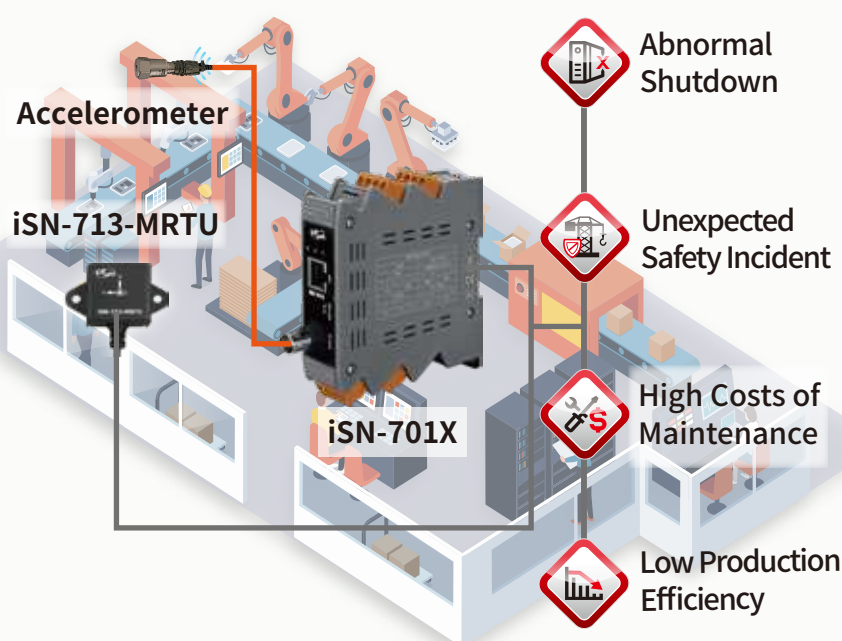
Communication Protocols

Modbus TCP / RTU

Fault Warning Output

Send alerts actively according to the upper threshold of eigenvalues

The Importance of Vibration Measurement



Fault Prediction with Early Maintenance

Continuously monitor vibration signals to detect potential issues (such as bearing damage, imbalance, etc.) and prevent equipment unexpected shutdowns.

Protect Equipment Safety

Perform maintenance based on real-time monitoring data, take necessary actions before hazards occur, and ensure the safe operation of equipment.

Extend Equipment Life & Reduce Costs

Vibration monitoring detects potential issues early, avoiding costly repairs and production losses

Enhance Production Safety & Quality

Vibration monitoring ensures optimal equipment performance, product quality, and production efficiency.

iSN-701X iSN-701X-mA

- ◆ External IEPE (1 axis) accelerometer.
- ◆ Choose accelerator based on equipment's rotation frequency/amplitude.
- ◆ Suitable for high frequency vibration measurement.

iSN-711-MRTU iSN-713-MRTU

- ◆ Built-in MEMS (1-axis / 3-axis) accelerometers.
- ◆ Suitable for low frequency vibration measurement.

Fault Alert

Modbus RTU

Modbus TCP

Data Acquisition

- ◆ Acceleration, Velocity, Displacement values.
- ◆ 20 sets of FFT spectrum.

Accelerometer Selection



Acceleration Range

- Micro-Vibration < 1 g
- General < 10 g
- Impaction > 10 g



Measuring Frequency

- Response Frequency > Measure Rotation Frequency
- Sampling Rate > Response Frequency x5



Others

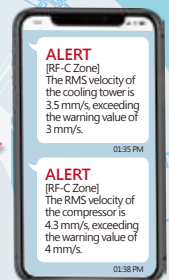
- Select resolution based on equipment and measurement objects.
- Ambient temperature and installation method.

Abnormal Alert

- ◆ Send Alarms with WISE Controller by E-mail/Line/SMS.
- ◆ Relay output to turn on the alarm module.

WISE Edge Controller

Exceeding Thresholds

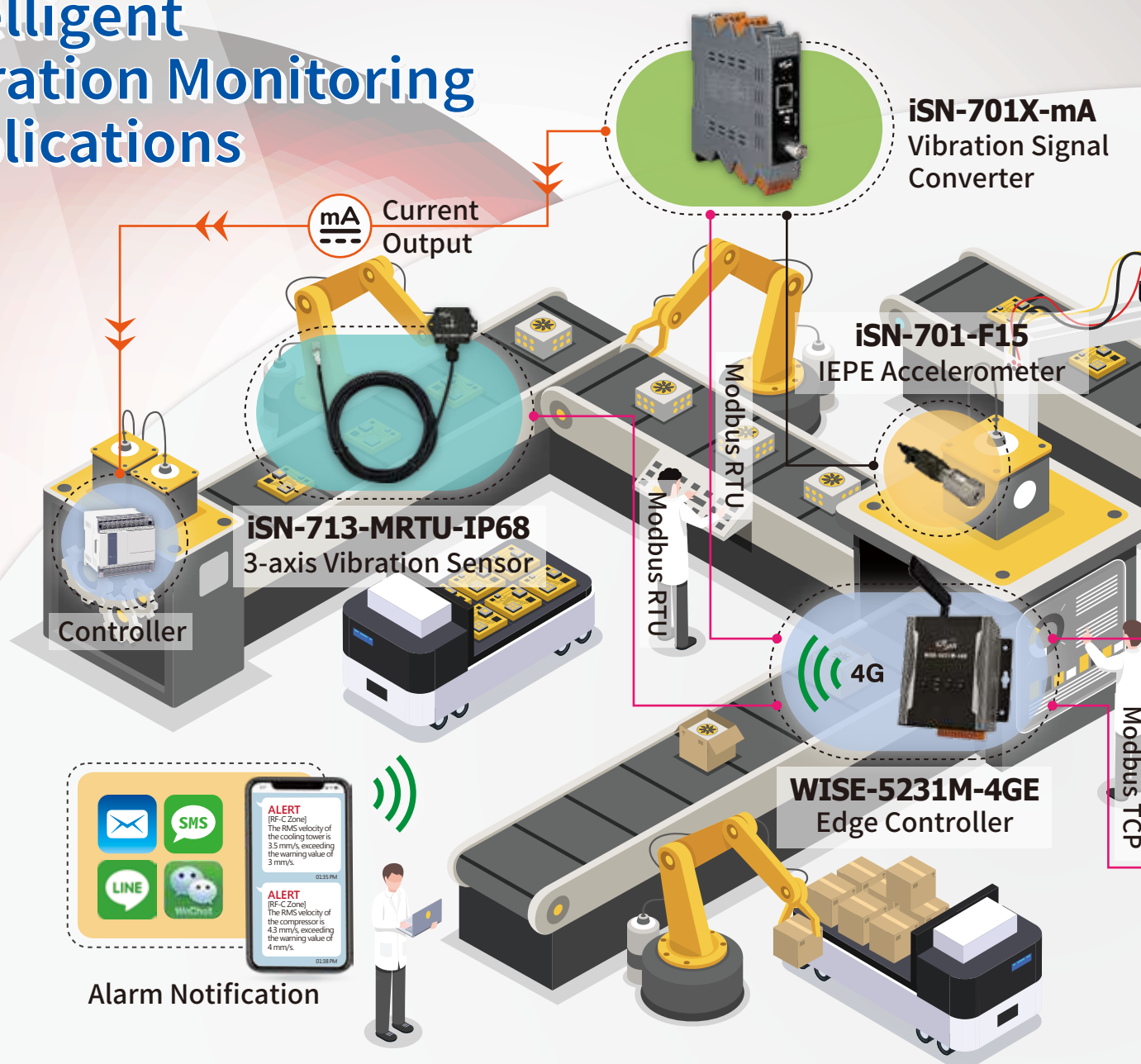


ALM-Horn-MRTU-BR Piezo Transducer Alarm Siren



ISO 20816-3	Medium-size Machines		Large Machines	
Advisor	Group 1		Group 2	
Velocity	Rated Power			
RMS (mm/s)	15 kW ~ 300 kW		> 300 kW	
11.0		DAMAGE OCCURS		
7.1		RESTRICTED OPERATION		
4.5		UNRESTRICTED OPERATION		
3.5				
2.8				
2.3				
1.4				
0.7		NEWLY COMMISSIONED MACHINERY		
Foundation	Rigid	Flexible	Rigid	Flexible

Intelligent Vibration Monitoring Applications



:: Electronic Factory Vibration Monitoring

The iSN Vibration Sensor Series is designed to accurately monitor machine aging and identify production equipment on the verge of failure, so as to avoid losses caused by equipment failure during the production process. The iSN-700 sensors can be connected to a monitoring system and upload real-time data. Engineers can analyze the vibration data remotely to find out the equipment with reduced production yield or even the possibility of downtime, which will bring a more stable manufacturing environment to the users.

- ◆ iSN-700 provides IEPE / MEMS accelerometer measurement.
- ◆ Support Modbus TCP / Modbus RTU protocol to read Acceleration, Velocity, Displacement, FFT spectrum values.
- ◆ The iSN-701X-mA synchronous output current signal is suitable for the integration of controller without communication interface.

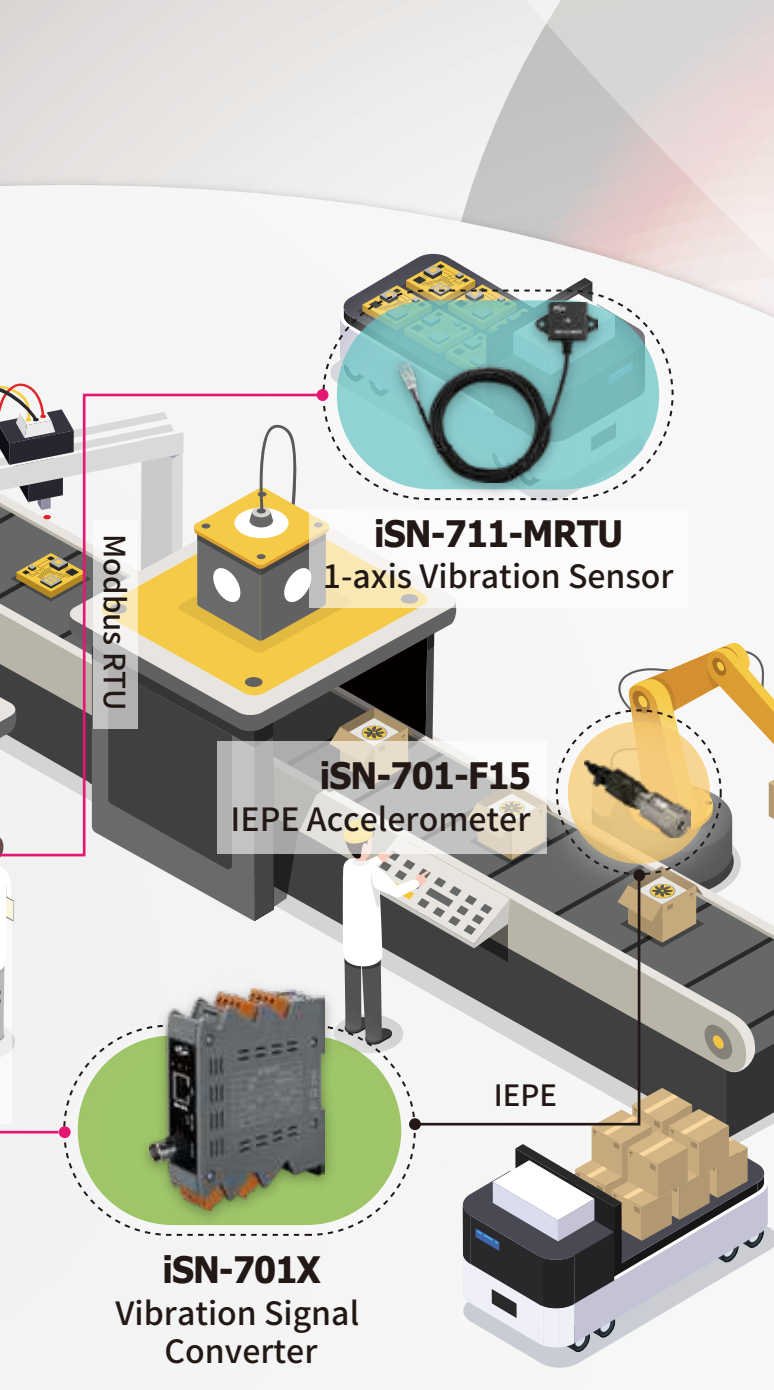
Typical Applications

Semiconductor Process Yield



Chemical Plant Motors / Pumps





Edge Computing Applications

Acceleration
↓
RMS

Changes in acceleration reflect the state of the machine, which is an important basis for early determination of mechanical abnormalities and helps to plan preventive maintenance.

Velocity
↓
RMS

Velocity is usually related to amplitude, and can reflect the eigenvalues of vibration energy. It is often used to determine the health status of bearings and generators.

Displacement
↓
Peak-to-Peak

Low-frequency vibration is a potential hazard and is commonly used to monitor large shelves, three-dimensional warehouse structures, and vibration monitoring related to warehouse safety.

FFT
Spectrum

Determine the type of failure of rotating equipment (bearing failure, unbalance, gear failure, etc.) by specific vibration frequency for fault identification and preventive maintenance.

Improvement

In the semiconductor manufacturing process, the robotic arm has been operating for a long time, and the loosening of parts is unavoidable, which may lead to inaccurate operation of the machine and lower production yields.

By using the iSN-701X module to monitor the vibration trend of important parts, the monitoring system can notify the engineers for preventive maintenance at the first time when it detects an abnormal increase in the trend, which stabilizes the production yield and prevents more serious accidents from occurring.

Pumps Monitoring

Large-scale chemical factories have a large number of motors and pumps, so traditional inspection methods are bound to consume a lot of time and manpower, and it is difficult to avoid inaccurate operations.

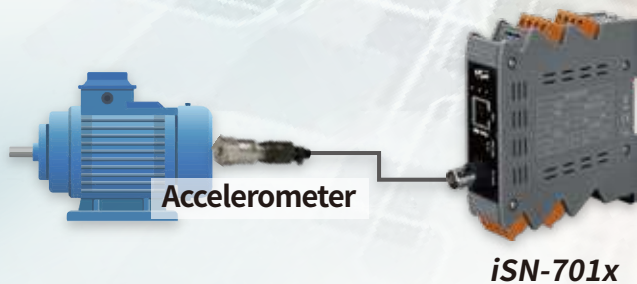
The iSN-713-MRTU is small in size and easy to install, and can be widely set up inside the factory to monitor a large number of equipments. Outdoors, iSN-713-MRTU-IP68 with waterproof performance can be used to effectively simplify inspection SOP, improve factory safety and reduce unexpected risks of equipment abnormalities.



iSN Vibration Sensing Module

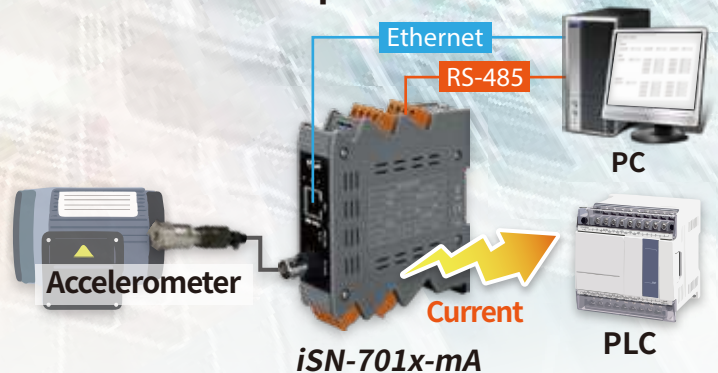
- Supports Modbus TCP / Modbus RTU protocols.
- Supports IEPE external accelerometer / MEMS built-in accelerometer for flexible selection.
- Provides multiple sensing of vibration eigenvalues: Acceleration, Velocity, Displacement, FFT spectrum.

◆ Single-Channel Data Acquisition



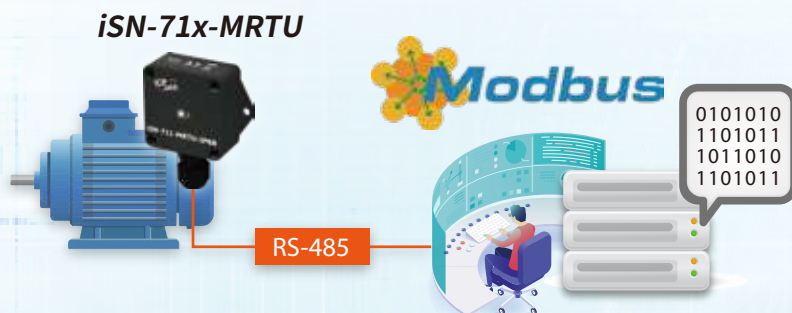
- ◆ Single-channel high-speed (64 kHz) data acquisition
- ◆ Supports IEPE accelerometer with high accuracy and excellent interference immunity.

◆ Convert Vibration Eigenvalues to Current Output

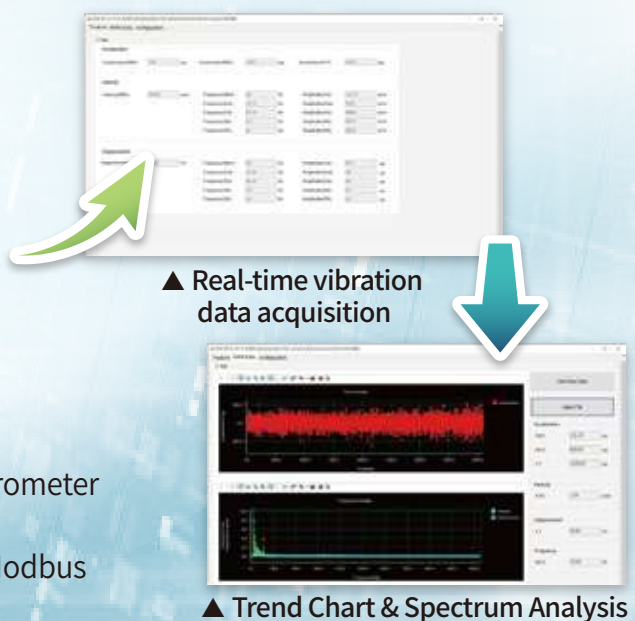


- ◆ Vibration signal value can be converted to current signal output.
- ◆ Integration of conventional analog control devices.

◆ Vibration Communication Integration



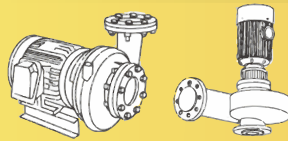
- ◆ Vibration measurement module with built-in MEMS accelerometer for easy installation.
- ◆ Read the vibration eigenvalues and FFT spectrum via the Modbus RTU protocol.



With iSN series vibration sensing modules, users can monitor the real-time vibration of equipment in various industrial fields such as semiconductor industry, petrochemical plants, food processing plants, pharmaceutical plants, paper mills, panel factories, LED factories, power plants, pumping stations, wastewater treatment plants, process manufacturers, equipment manufacturers, maintenance service providers, etc. to grasp the long-term vibration trend of equipment. By analyzing the vibration data, it helps users to improve the stability and safety of production operations.

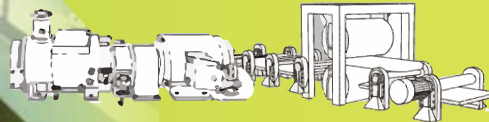
Pump Equipment

Vacuum Pumps,
Suction Pumps,
Sewage Pumps, etc.



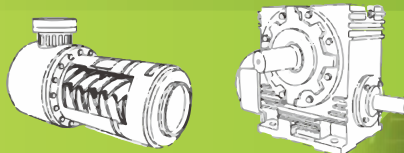
Production Machines

Tool spindles, paper cutters,
cutting machines, etc.



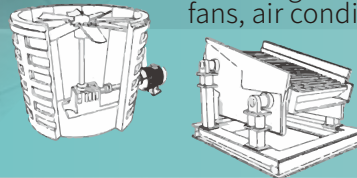
Air Compressors

Screw type, centrifugal
type, reciprocating type
air compressor, etc.



Other Equipments

Cooling towers, exhaust
fans, air conditioning, etc.



Unit/Target	Application Objectives
Engineering Department	Replacing the traditional testing methods of physical and empirical judgment by personnel to provide scientifically based measurement data.
Facility Engineer	Measure the status of the equipment at any time, and the historical data can be used as the basis and support when reporting repairs.
Maintenance Vendor	Analyze the measurement data accumulated over a long period of time and plan the periodic inspection cycle.
Equipment Supplier	Accurately identify equipment problems and provide service records.

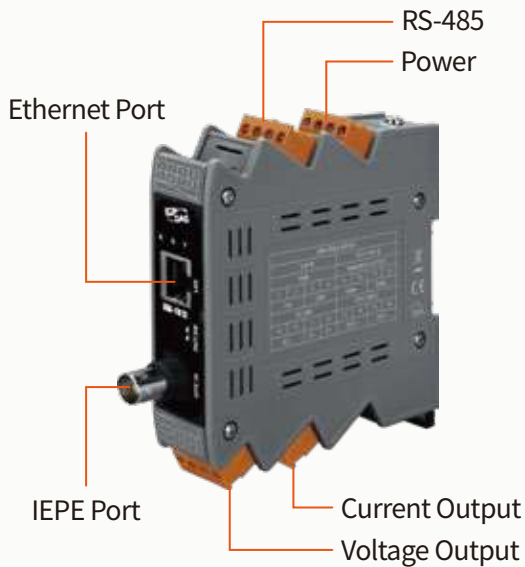
Selection Guide

Vibration Sensor



Model	iSN-711-MRTU iSN-711-MRTU-IP68	iSN-713-MRTU iSN-711-MRTU-IP68
Vibration Measurement		
Axes / Type	1 / MEMS	3 / MEMS
Amplitude Range	±8 g	
Sampling Rate	8 kHz	
Frequency Range	6 Hz ~ 1 kHz	
Data Format	Acceleration, Velocity, Displacement, FFT Spectrum	
Communication		
Interface	RS-485 x 1	
Protocol	Modbus RTU	
Mechanical		
Ingress Protection Rating	IP30 / IP68	
Installation	Wall-mount / Magnet adsorption	

Signal Converter



Model	iSN-701X	iSN-701X-mA
Vibration Measurement		
Axes / Type	1 / IEPE	
Range	Voltage: ± 10 VDC	
Resolution	24 bit	
Sampling Rate	32, 64 kHz	
Frequency Range	6 Hz ~ 6.4 kHz	
Data Format	Acceleration, Velocity, Displacement, FFT Spectrum	
Analog Output		
Channels	-	Current (0~20 / 4~20 mA)
Signal	Voltage (± 10 VAC)	
Communication		
Interface	RS-485 x 1, Ethernet x 1	
Protocol	Modbus RTU, Modbus TCP	

IEPE Accelerometer



iSN-701-F15-L030	iSN-701-F15-L060
Range 80 g, Sensitivity 100 mV/g, Response Frequency 15 kHz, Cable Length 3 M (RoHS)	Range 80 g, Sensitivity 100 mV/g, Response Frequency 15 kHz, Cable Length 6 M (RoHS)

Outsourcing Acceleration Standards	Excitation Current	< 4 mA
	Range x Sensitivity	Range (g) x Sensitivity (mV/g) ≤ 10 V
	Response Frequency	Max Frequency (Hz) x 5 < Module Sampling Rate (Hz)
	Voltage Range	Range (g) * Sensitivity (mV/g) + Voltage (V) ≤ 20 V

