Vol. AR_F.1.24.02_EN

AR Series
Vibration Data Logger

Intelligent Vibration Monitoring

Rotating Equipment Inspector

Critical Vibration Data Integration

Velocity, Acceleration, Displacement, FFT Spectrum...etc.

Multi-trigger Recording Mode

Suitable for various vibration monitoring applications

Visualization Tools & SDK

Fast and efficient integration of application solutions

Up to 200kHz Sampling Rate

Satisfy applications such as preventive maintenance and machine inspection

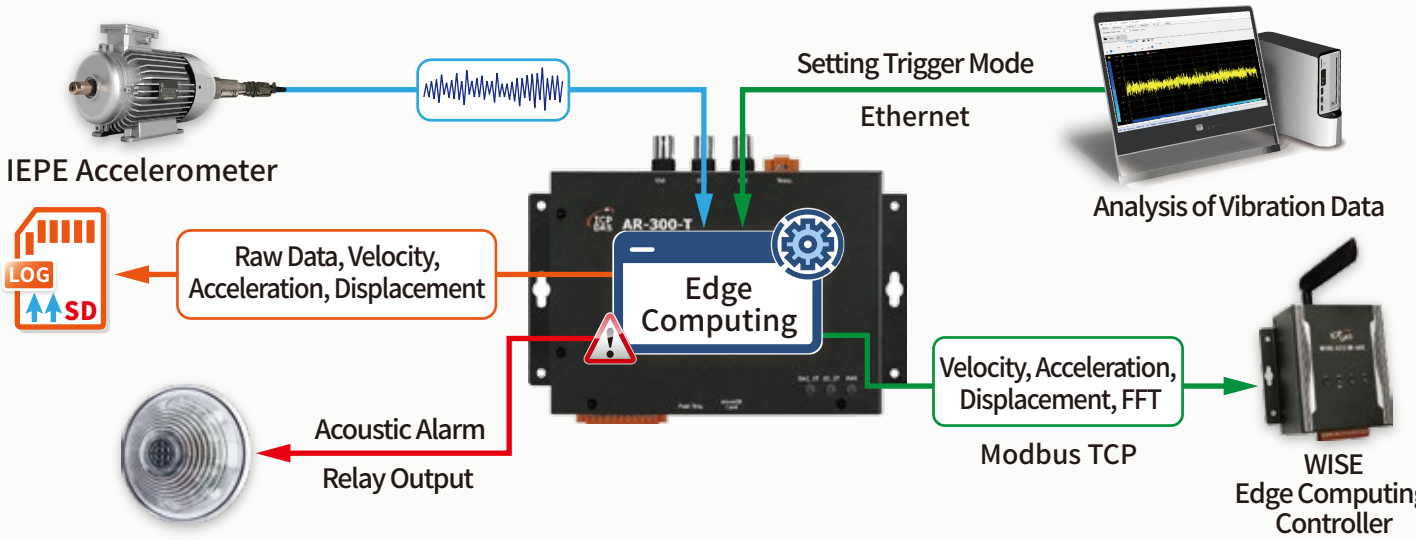
Features

The AR series is a high-performance dynamic signal acquisition module designed for vibration monitoring and analysis with the following features: maximum sampling rate up to 200 kHz, 16-bits high-precision Integrated Electro-Piezoelectric (IEPE) measurements, and acquisition data can be stored on a Micro SD card for offline vibration data analysis. ICP DAS provides tool software to help users easily select multiple triggering modes to schedule the appropriate data sampling schedule for their application.

Edge Computing
Real-time Analysis & Alerts

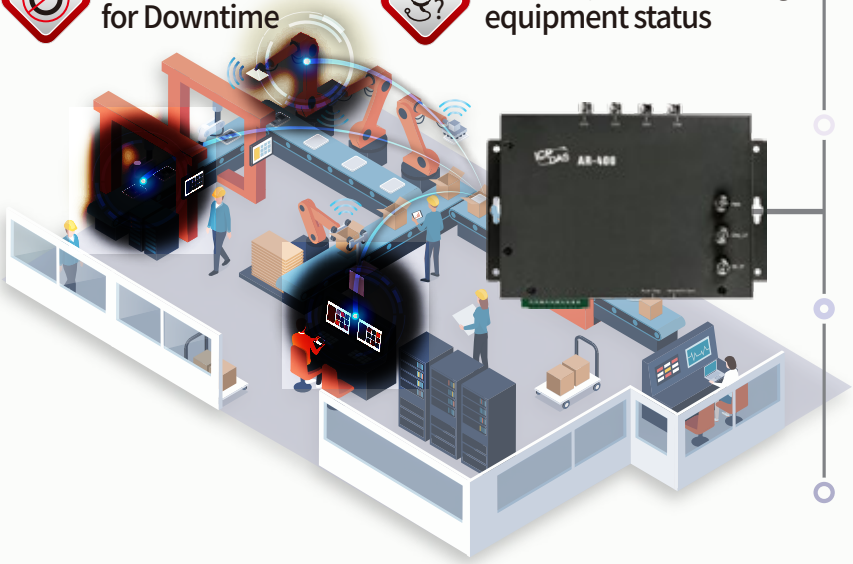
Micro SD Recording
Reliable Data Storage

Free Tools
Offline Analysis & Acquisition



The Importance of Monitoring Critical Equipment

- Record omission of operational data
- Evaluate the maintenance of equipment
- Zero Tolerance for Downtime
- Difficulty in interpreting equipment status



Measuring equipment by accelerator
Measure high-resolution, high-frequency vibration data of rotating equipment and use it to analyze production line quality.

Ensure product yields by monitoring
Vibration monitoring can avoid production defects and unwarranted shutdowns when equipment is aging and deformed.

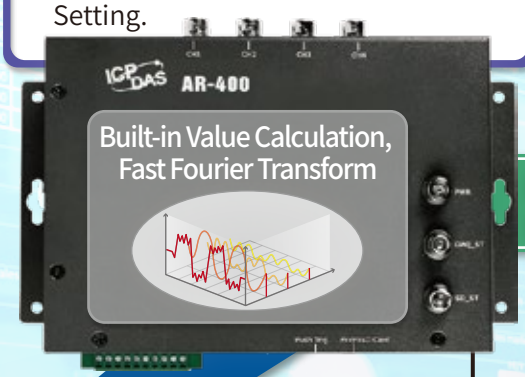
Early preparation & maintenance schedule
Diagnose the status of your equipment and plan maintenance schedules in advance.

IoT System for Data Integration
Real-time monitoring of equipment status can effectively shorten inspection and repair time and improve efficiency.

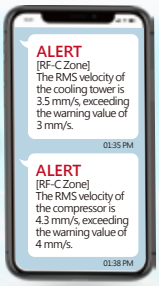
Data Analysis

Selection & Installation Setting

- Selection of accelerator according to rotating frequency/amplitude.
- Communication and Storage Trigger Setting.



Over Threshold



Basic Applications
Error Alerts

Modbus Comm.

Numeric Acquisition

- Velocity, acceleration, displacement.
- 20 groups of FFT spectrum.
- Integration of WISE Edge Controller.

Advanced Applications
Precision Analytics

Relay Output Alarm

Data in MicroSD

ISO 20816-3	Medium Machines		Large Machines	
Technical Guidance	Group 1		Group 2	
Speed	Rated Power			
RMS (mm/s)	15 kW ~ 300 kW		> 300 kW	
11.0	Machine Damage			
7.1				
4.5	Restricted operation			
3.5				
2.8	Normal operation			
2.3				
1.4	New Adaptive Machines			
0.7				
Comparison Basis	Strict	Flexibility	Strict	Flexibility

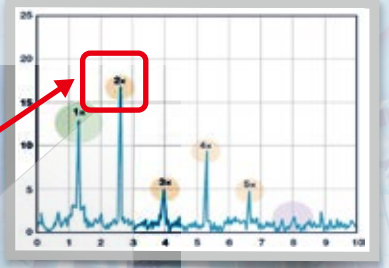
Trigger Record, Extract Data

- Multiple triggering modes for data storage.
- Get historical data with SDK.
- Fast Fourier Transformation of historical data into spectrum for vibration spectrum analysis and diagnostic reference.

Raw data

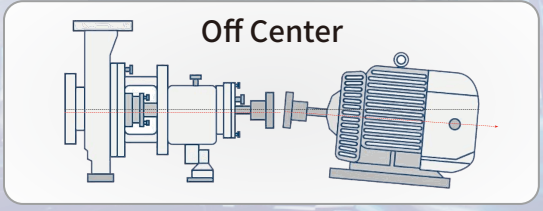
Fast Fourier Transform

Spectrum Data

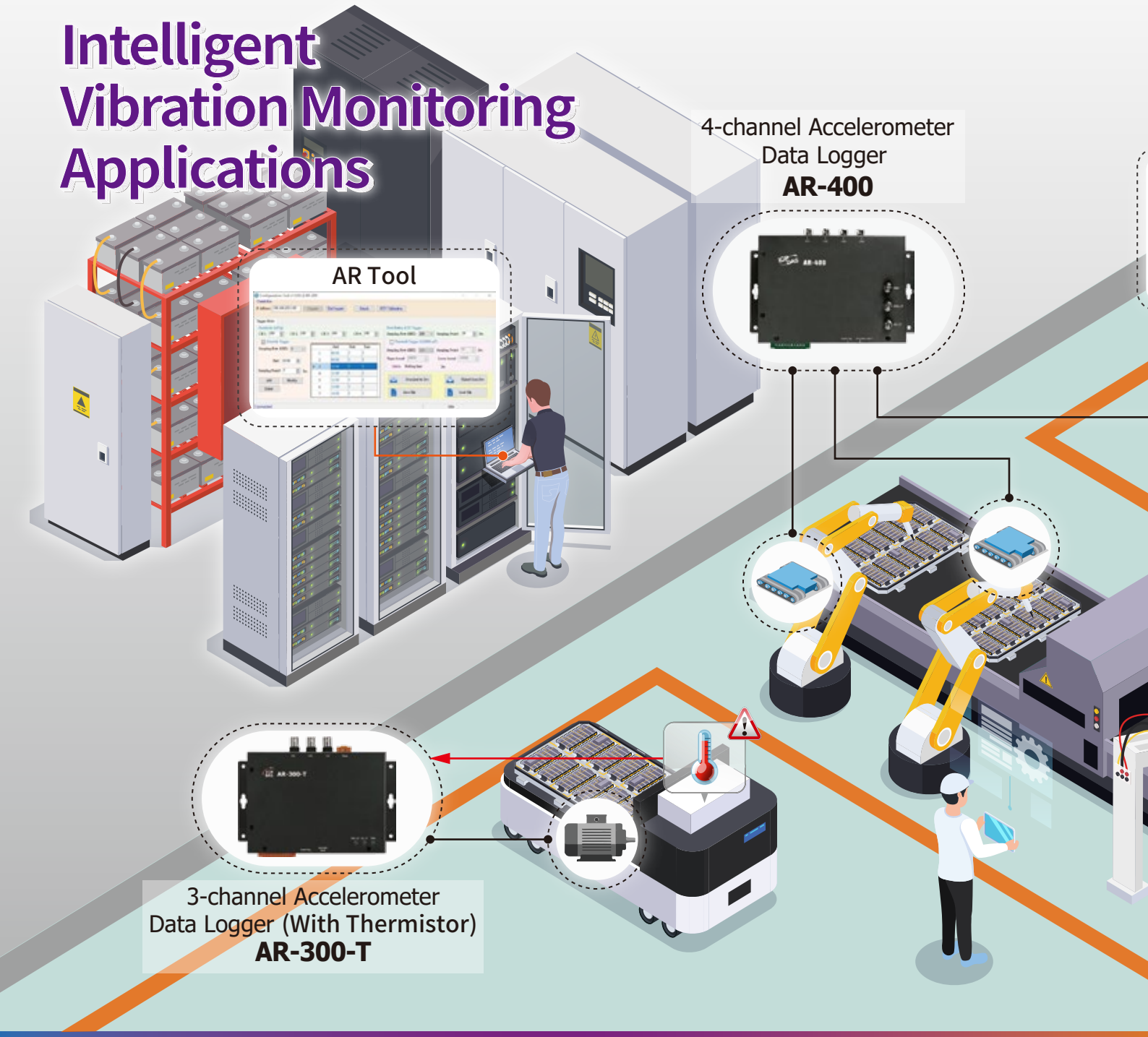


Common Mechanical Problems

- Bearing misbalance and bending.
- Poor radial/axial alignment.
- Mechanical internal and external loosening.
- Friction change of rotating shaft.



Intelligent Vibration Monitoring Applications



Semiconductor & Optoelectronics Plant

ICP DAS's vibration measurement solution helps to prevent equipment maintenance scheduling and reduce the loss caused by equipment failure and downtime. The AR series vibration data logger with accelerometer can upload the real-time measurement data to the control system. The engineers can analyze the measurement data and find out the machines that have the possibility of downtime due to the vibration factors, so that they can set up a more effective maintenance program for the production operation.

- AR series vibration recorders with IEPE accelerometer measure vibration data and store records.
- Support Modbus TCP protocol. Provides vibration measurement items such as velocity, acceleration, displacement, and FFT spectrum value.
- WISE series can be used for data analysis, threshold comparison and push line alarm.

Classic Applications

Cold Rolling Mill Roller Moni

Drive Shaft Vibration Monito

Multi-trigger Recording Modes

Push Button trigger
In case of equipment abnormality, the control button will be triggered directly to save the record.

Digital Input Trigger
Receive the digital trigger signal from the monitored device for recording.

Schedule Trigger
Maintains equipment operation, recording regularly according to the daily running time. Suitable for big data analysis applications.

Analog Threshold Trigger
Captures and calculates the vibration characteristics in real time, sends an alarm when the threshold value is exceeded and records the current data.

Remotely Utility Trigger
The utility monitors the operating status of each piece of equipment in the production line and can be customized to automatically trigger a record when data is abnormal.

toring

When the vibration velocity of the two ends of the bearing are different, the uneven stresses generated will increase the friction of the related parts and lead to wear and tear, which will reduce the operational efficiency and shorten its service life. Use AR-200 to measure the vibration speed of both ends of the bearing and compare the difference: when the speed difference exceeds the threshold value, the maintenance personnel will arrange maintenance for the equipment according to the system notification in order to prevent the equipment from destroying and causing interruption of the process.

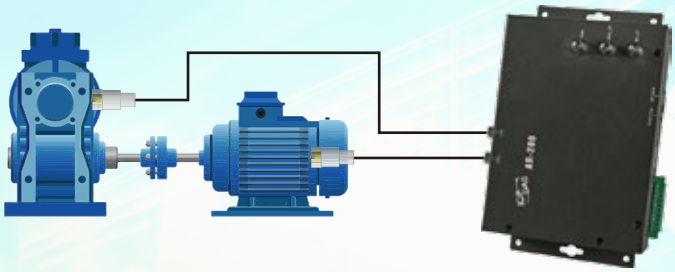
ring

The drive shafts of steel trucks in steel mills will be worn out and worn out under long-term driving and loading of heavy loads. If they are not repaired and inspected in time, they may be damaged in the course of transportation, and accidents may occur. The AR-400 can simultaneously measure the vibration data of 4 wheel rotating axles, so that the freight personnel can grasp the abnormal vibration or excessive displacement of the axles, such as wear and unbalance, and arrange preventive maintenance for the vehicles.

Applications

Dual Channels

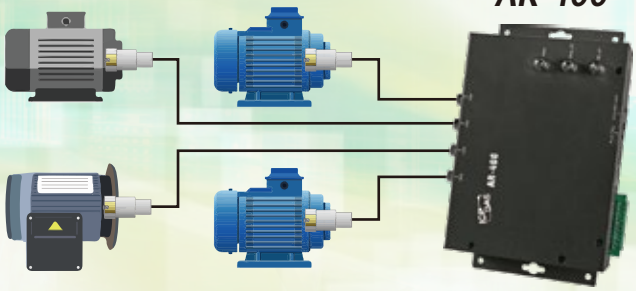
AR-200



- Dual-channel high-speed (200 kHz) data acquisition
- Synchronized measurement of both ends of the rotary device, high-speed acquisition function can effectively analyze the operating status.

Quad Channels

AR-400



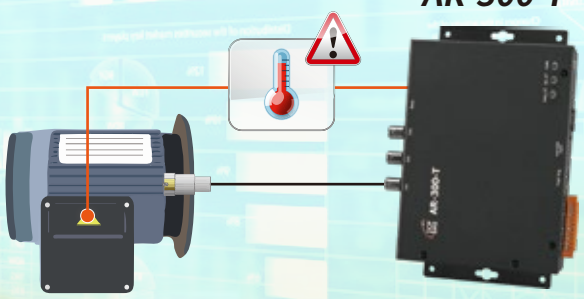
- Multi-device independent acquisition
- Individual comparison of data to realize district-wide monitoring of preventive maintenance.

AR High-speed Data Logger

- Schedulable Offline Data Acquisition (.csv/.txt)
- Built-in IEPE interface
- Data Measurement：
  Velocity, Acceleration, Displacement, FFT spectrum….

Triple Channel

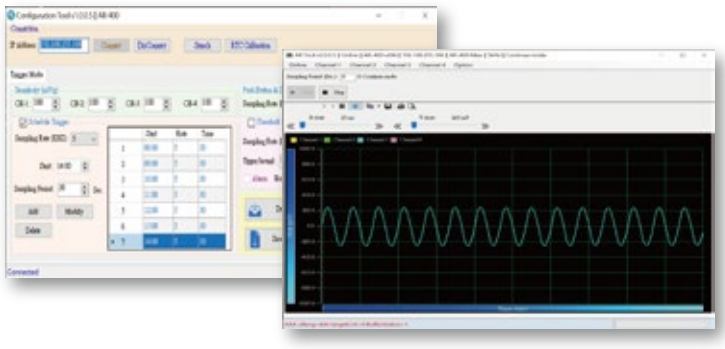
AR-300-T



- Simultaneous measurement of vibration and temperature data
- In addition to problems such as eccentricity and aging, it can also detect abnormal heating of equipment components.

The Features of the AR Tool

- Multiple trigger modes
- Remote download of files from Micro SD memory cards
- Real-time waveform display
- Waveform history can be replayed



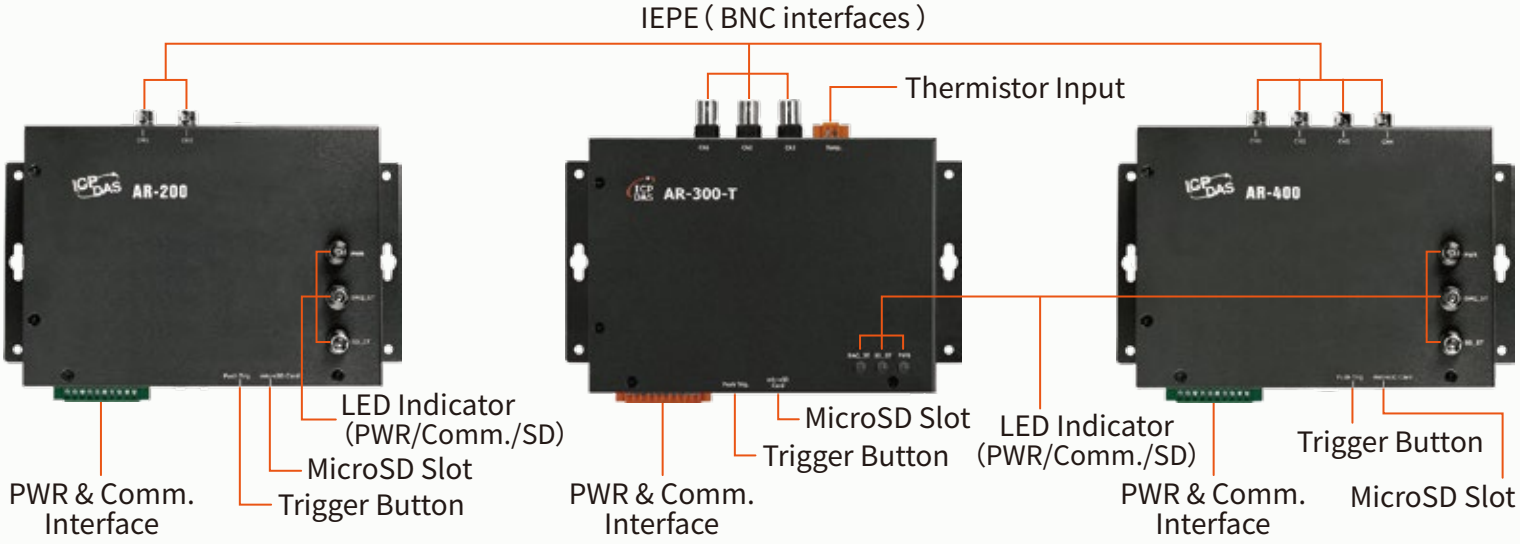
Quick Installation, Data Acquisition, Development & Analysis

Objectives

With the AR series of high-speed vibration data loggers, users can monitor real-time vibration in a wide range of industrial settings such as semiconductor industries, petrochemical plants, food processing plants, pharmaceutical plants, paper mills, panel mills, LED factories, power plants, pumping stations, wastewater treatment plants, process manufacturers, equipment manufacturers, and maintenance service providers, etc. The vibration data can be analyzed and used to monitor the long-term vibration trend of the equipment. By analyzing the vibration data, it can effectively help users to improve the stability and safety of production operations.

Unit/Object	Application Objectives
Engineering Manufacturer	Provision of scientifically validated testing methods.
Integration Engineer	The test data can be used as the basis and support for the repair report.
Maintenance Manufacturer	Analyze the inspection data accumulated over time to plan regular inspections and cycles.
Equipment Supplier	Accurately identify equipment problems and provide service records.

Selection Guide



Module	AR-200	AR-300-T	AR-400
Analog Input			
IEPE Channels	2 (BNC)	3 (BNC)	4 (BNC)
ADC Resolution	16-bit		
Sampling Rate (kHz)	5, 10, 20, 50, 100, 200	5, 10, 20, 50, 100, 125	
Trigger Mode	Button Trigger / Scheduler Trigger / Value Trigger / Digital Input Trigger / Remote Trigger		
Thermistor	-	1 CH (0°C ~ 80°C)	-
Digital Input/Output			
Input Channels	1 (Dry / Wet Contact)		
Voltage Level	OFF Voltage Level：+4 VDC max. / ON Voltage Level：+10 VDC ~ +50 VDC		
Output Channels	1 (FORM A Power Relay)		
Contact Capacity	AC：125 V @ 0.6 A；DC：30 V @ 2 A / 110 V @ 0.6 A		
Others			
Comm. Ports	10/100 Base-TX Ethernet, Modbus TCP Server		
Expansion Slot	Micro SD (Built-in 4 GB, supports up to 32 GB)		

Accessories

IEPE Single Axis Accelerometer (Optional)	
iSN-701-F15-L030	**iSN-701-F15-L060**
Measuring Range 80 g; Sensitivity 100 mV/g; Response Frequency 15 kHz; Includes 3 m cable (RoHS)	Measuring Range 80 g; Sensitivity 100 mV/g; Response Frequency 15 kHz; Includes 6 m cable (RoHS)

Outsourcing Acceleration Standards

Excitation Current	< 4mA
Range x Sensitivity	Measuring Range (g) x Sensitivity (mV/g) ≦ 10V
Response Frequency	Max. Frequency (Hz) x 5 < Sampling Rate (Hz)
Voltage Range	Measuring Range (g) x Sensitivity (mV/g) + Bias Voltage (V) ≦ 20 V

ICP DAS Industrial Automation Technology Innovator and Enhancer.

+886-3-5973366 www.icpdas.com

info@icpdas.com / sales@icpdas.com