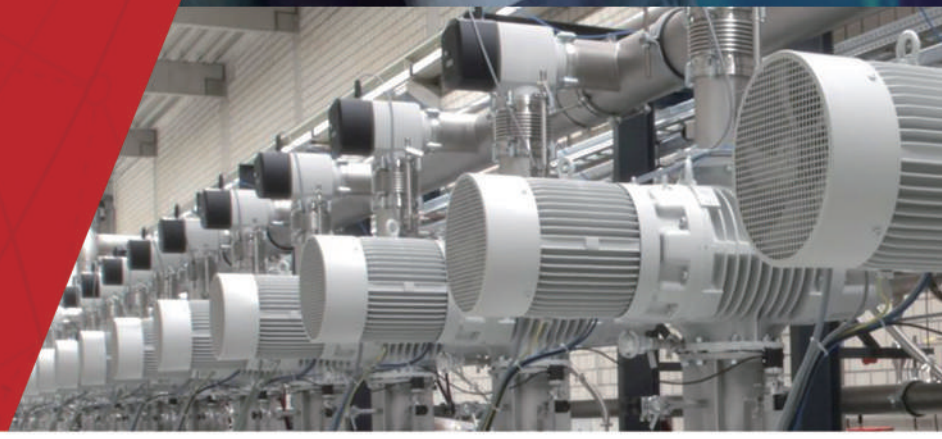
ADLINK
Leading EDGE COMPUTING

Enabling Remote Facilities and Equipment Monitoring and Management

Intelligent Machine Condition Monitoring Solution





www.adlinktech.com

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Monitor and Manage Facilities & Equipment with Ease



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The system allows users to plan and prepare precautionary intervention to prevent equipment downtime, extend equipment lifetime, reduce maintenance costs, and increase operational reliability and security while maximizing productivity.

Sensor-to-Cloud Solution

One-stop solution integrates edge detection, data acquisition, edge computing, data analysis and dashboard configuration





Flexibility and Scalability

Powerful cloud platform and SaaS provide connection to cloud services of eco-partners to support a wide variety of application scenarios

Onsite Vibration Analyzer

Pre-installed spectrum analyzer provides precise predictions and notifications, storing raw data for subsequent analysis and AI application

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Comprehensive, Low Cost Automatic Monitoring



With the rise of the Internet of Things, manufacturers who have actively established automated monitoring systems can often end up suffering due to the large amount of resources invested, lack of software developers and system integration capabilities, and difficulty in assessing benefits. ADLINK aims to help enterprises break through the deadlock and build smart device monitoring applications from the endpoint (device, sensor, gateway) to cloud (Paas, SaaS) in order to implement more effective equipment failure prevention.

Reduced Cost

Lowered Entry Barrier

Real Time KPI Assessment



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Applications

Precautionary Diagnosis for the Energy Industry
Real time monitoring of motors, pumps, decelerators, air compressors, and air blowers

Preventive Maintenance for the Semiconductor Industry
Safeguarding operational status of vacuum pumps and robotic arms.

Vibration Monitoring on CNC lathes
Optimizing CNC machining by monitoring vibration in drive shafts and cutting tools.

Remote Facility Monitoring
Providing cross-domain monitoring of heavy lifting equipment, vacuum pumps, air compressors, and rotary tools



ADLINK's Solution Lowers Entry Barriers and Costs for Automatic Monitoring

Easy Deployment
All-in-one design simplifies cable runs, compact construction reduces space requirements, and easy installation near target equipment reduces installation and cabling costs

Remote Monitoring Visualization
Real-time monitoring via equipment connectivity achieves quick, easy equipment performance assessment and intelligent management

No Need for Programming
Customize dashboard and alarm rules via intuitive interfaces with no need for programming, conserving development labor and time

Reduced Expansion Costs
New module blocks are easily implemented in dashboard configuration when facilities or equipment are added, rather than redeploying or reconstructing the whole system

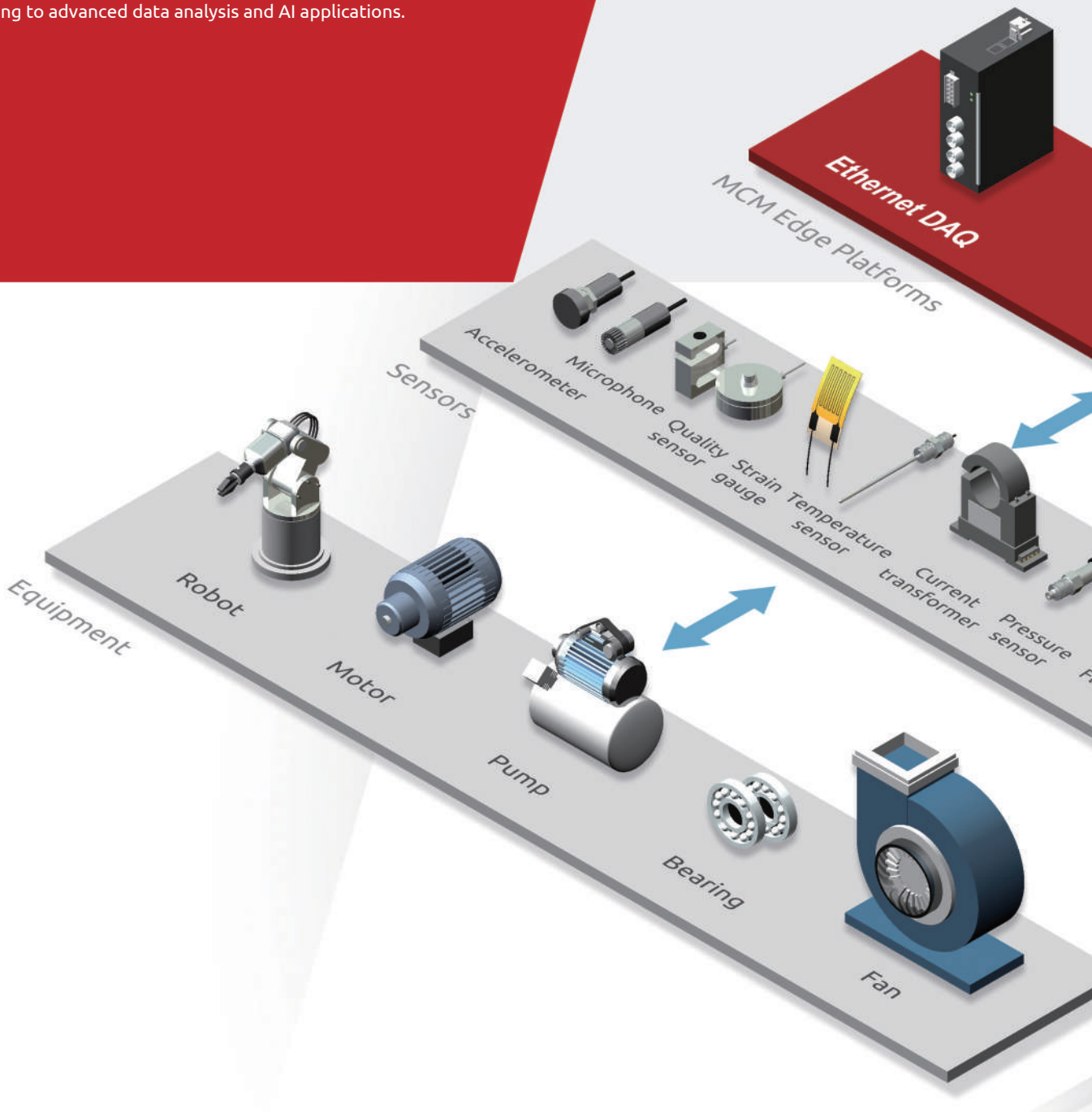
Precise Real Time Measurement, Analysis and Notification
Precise predictive notifications of equipment abnormality avoid unexpected breakdowns and downtime expenses

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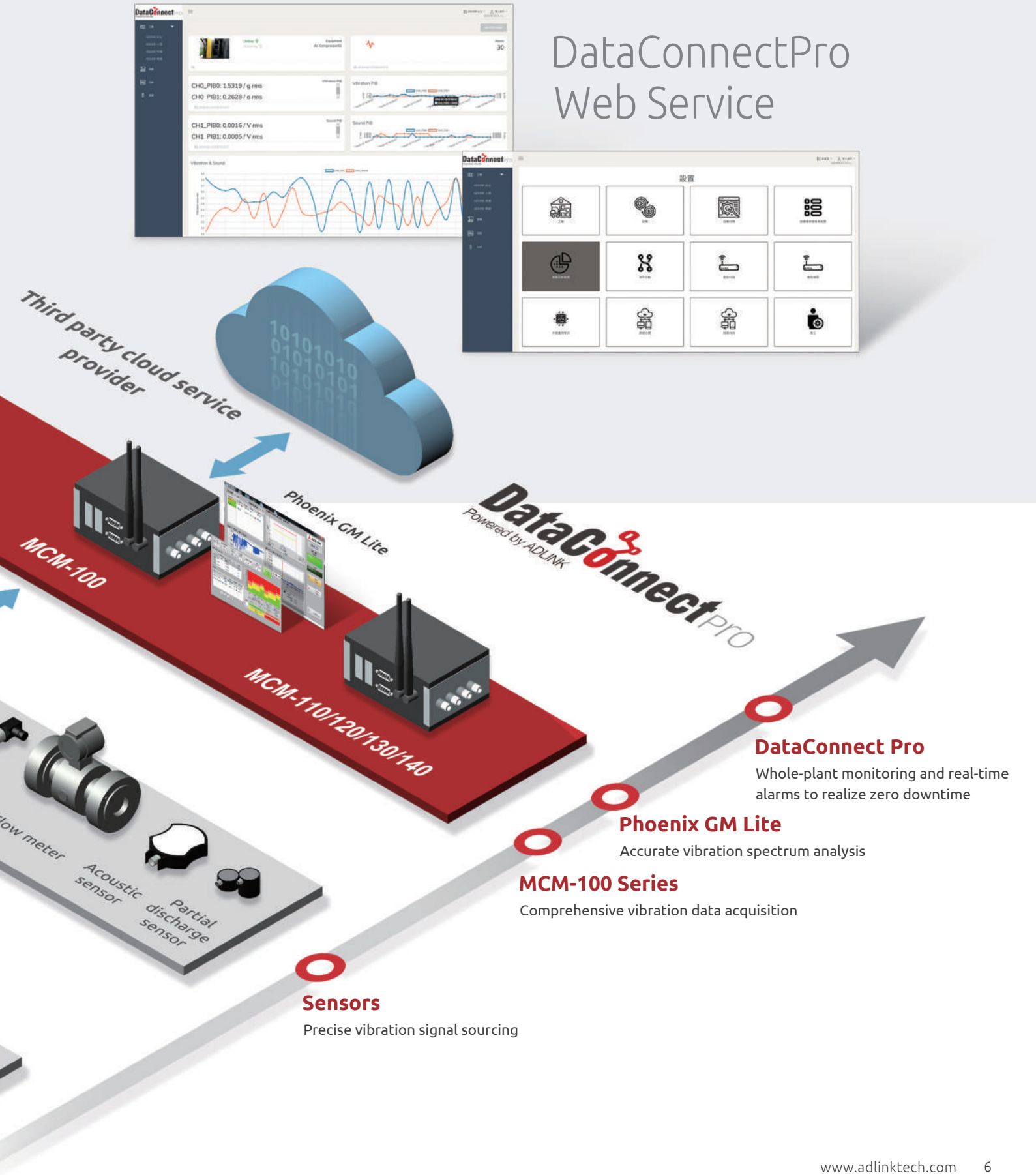
Quick Integration from Sensor to Cloud

Smarter and More Flexible

ADLINK machine condition monitoring integrates sensors, data collection, edge computing, vibration analysis software, and dashboard, for a one-stop solution able to satisfy a complete range of user requirements, from remote facility monitoring to advanced data analysis and AI applications.



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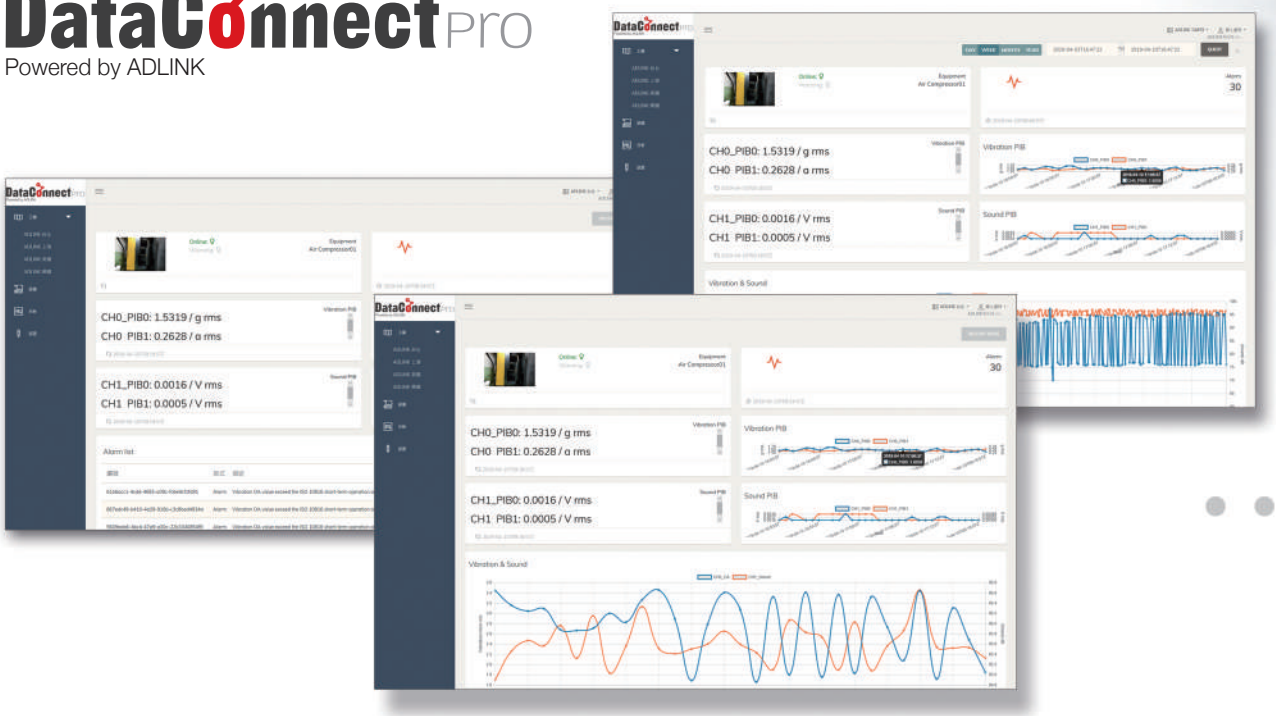
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DataConnectPro Remote Facility Information Dashboard

Via the dashboard users can keep an eye on the operational status of multiple remote facilities in real time and build strategies for effective preventive maintenance based on actionable intelligence, so as to improve equipment reliability.

- *Provides historical data, alarm notifications and mobile phone browsing*
- *All users have independent secure accounts and can configure their own dashboard based on their needs*
- *Flexible scalability allows easy monitoring ramp up for expanded facilities and equipment*

DataConnect Pro
Powered by ADLINK

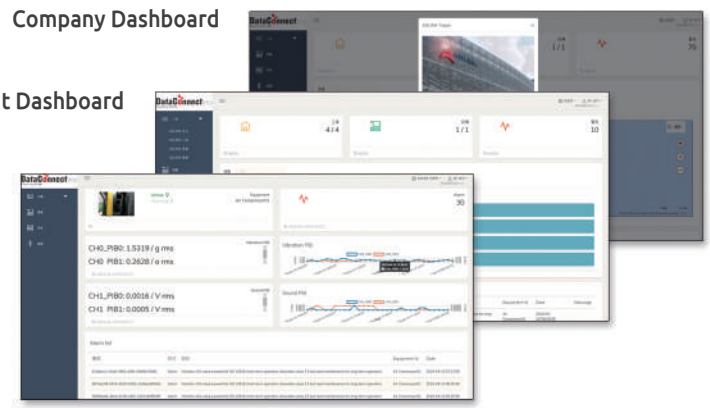


Three tiered information structure satisfies user needs for remote monitoring control and management of their assets.

Company Dashboard

Plant Dashboard

Equipment Dashboard



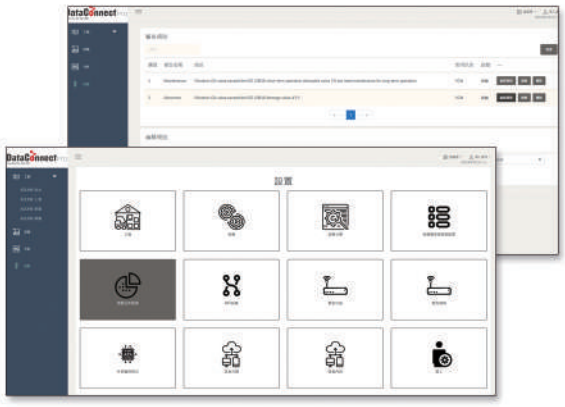
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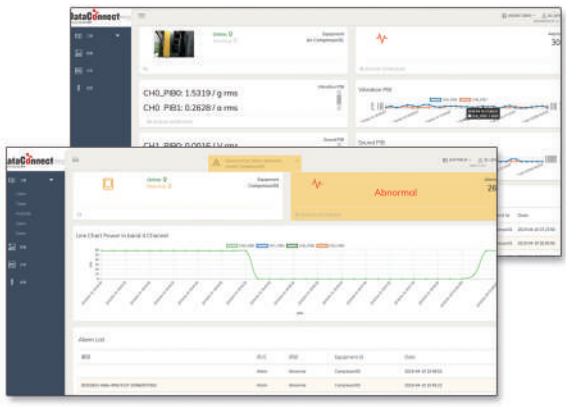


No need for programming. The dashboard allows users to easily configure and add their expanded facilities into the monitoring system.

Comprehensive notification

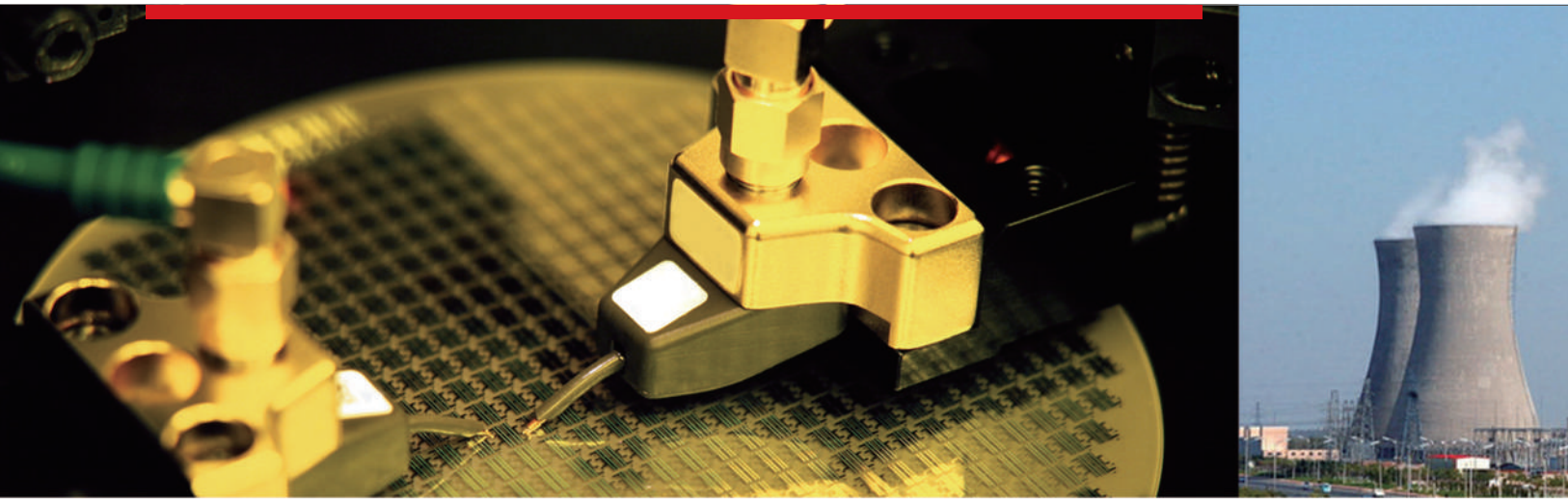
- Alarm rule settings
- Alarm display and record
- Alarm notification function service setting





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Semiconductor Equipment Monitoring and Preventive Maintenance



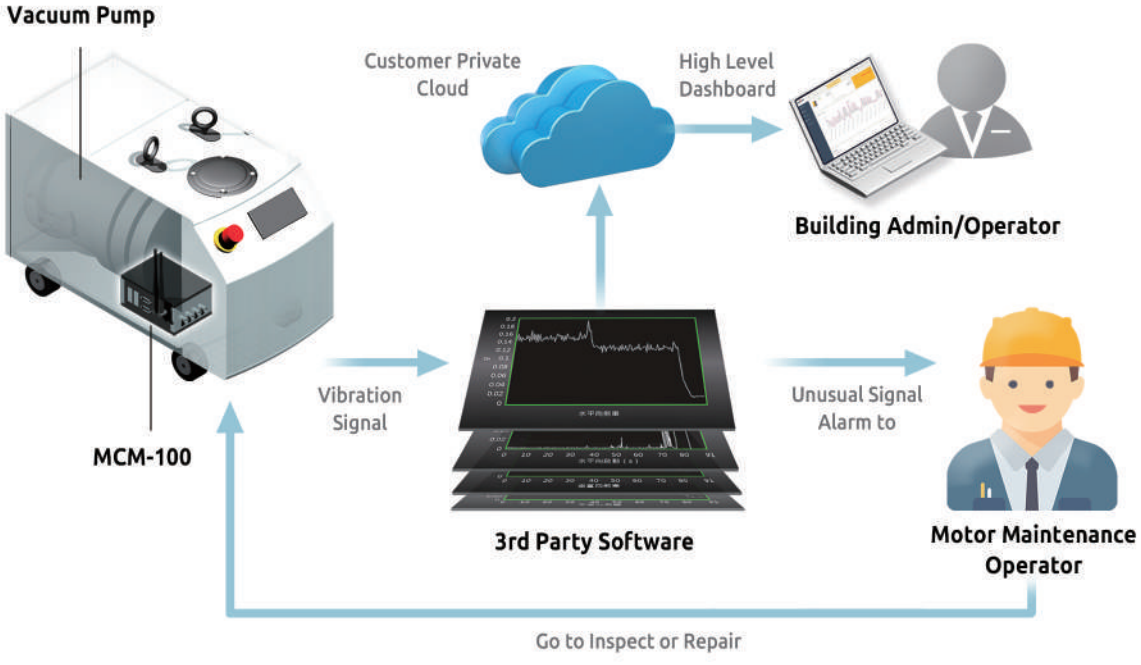
Components used in semiconductor fabrication—such as furnaces and ion implantation accelerator—are often driven by a vacuum pump containing a rotary engine and Roots-type blower. However, while the monitoring system provided by the vacuum pump supplier can monitor parameters including pressure, flow, temperature, and electric current, vibration remains un-monitored, making it difficult to predict equipment failure and take preventive measures. accordingly, the customer was in need of a complete solution for vacuum pump inspection based on intelligent methods.

Solution Features

- MCM-100 provides 4 channels for simultaneous sampling of 4 bearings
- High resolution capability in identifying even the slightest evidence of cavitation and powder turbulence
- One-stop data collection, analysis and uploading, connected with the upper tier ERP/MES

Customer Benefits

- Identifies early signs of failure to prevent unexpected breakdowns
- Obtains reliable information, improving yield and reducing maintenance costs
- Provides verification of machine conditions upon returning from maintenance



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Intelligent Predictive Maintenance for Petrochemical Plants



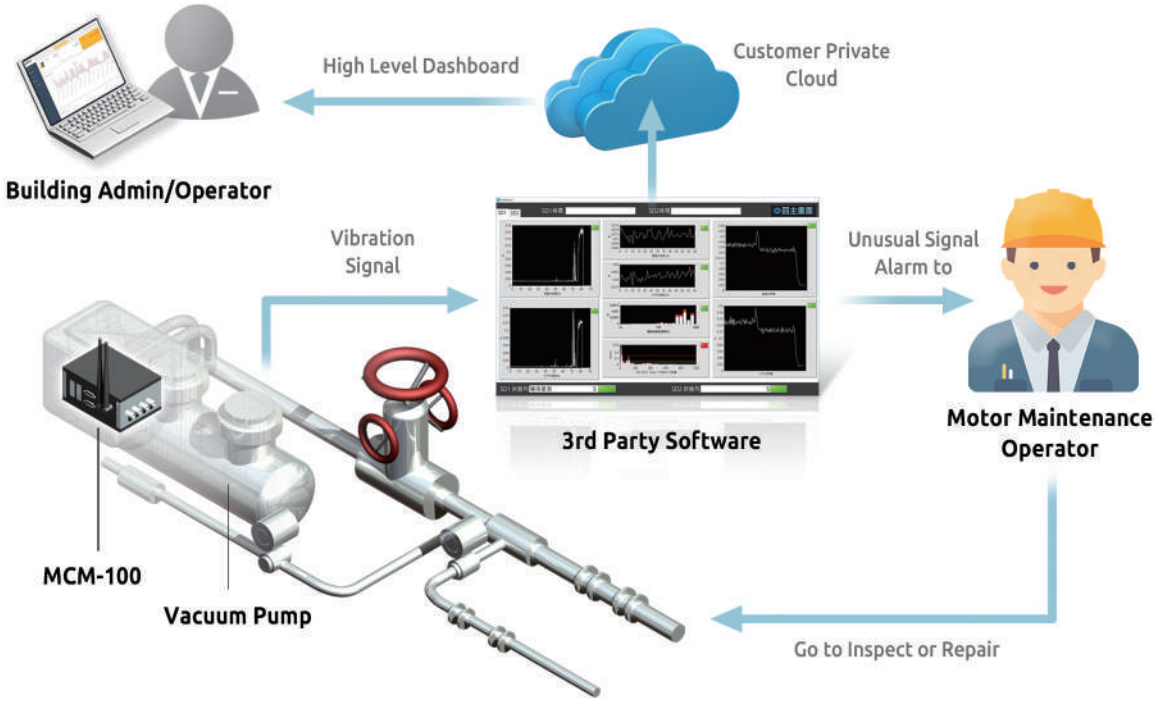
A petrochemical plant is crowded with a great variety of equipment to cope with processing needs, such as motors, pumps, decelerators, air compressors, air blowers, etc. To avoid unexpected failure of any equipment, traditional practices ask for regular manual inspections by technicians, only to find that the chances of breakdowns are still high. This project installed a preventive maintenance system based on intelligent data analysis, with the hope to eliminate any possibility of unexpected breakdowns and improve equipment uptime and availability.

Solution Features

- 24/7 monitoring and alarms · Automatic real time data logging, analysis and uploading, connected with SCADA system
- Non-intrusive method for easy installation without the need to cease production during installation

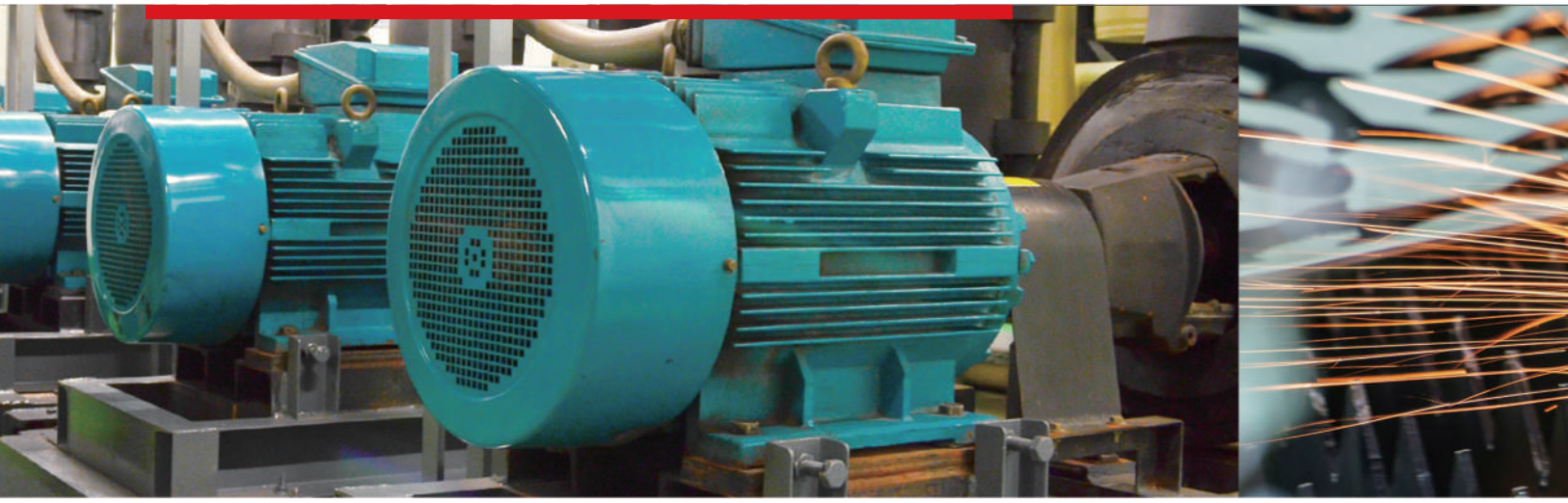
Customer Benefits

- Provides a holistic view of operational status in real time
- Forecasts equipment health potential to prepare earlier intervention
- Remote monitoring and alert delivery via the cloud to improve maintenance efficiency



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Intelligent Predictive Maintenance for Air Compressors



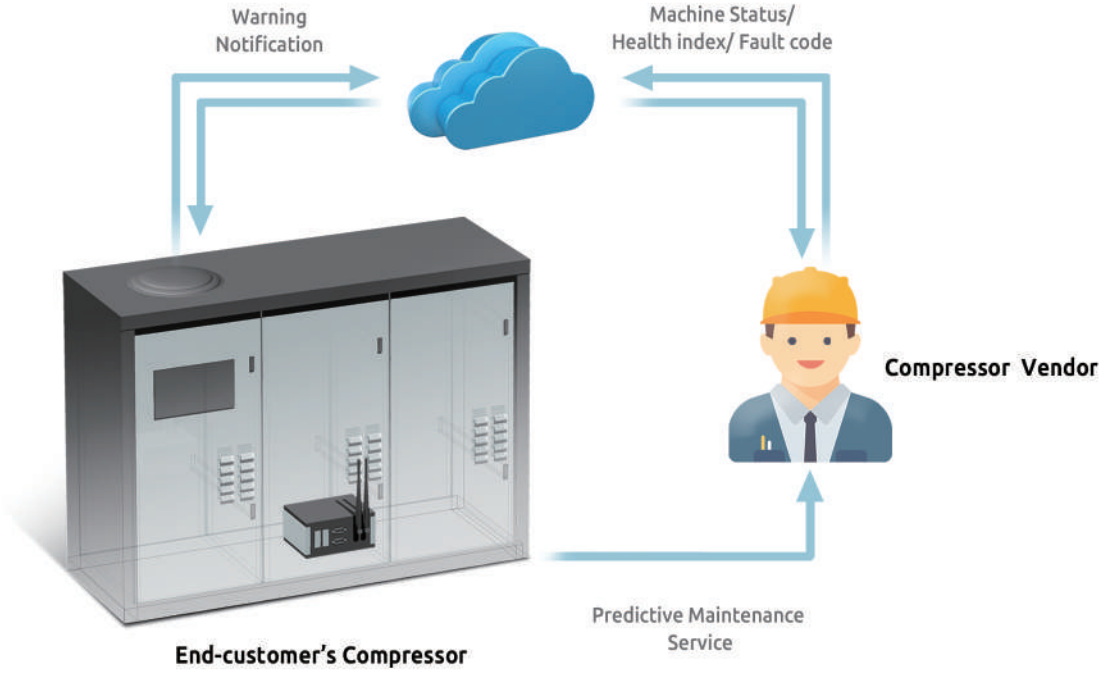
Air compressors are widely used in many industrial environments. Facing severe competition in the market, a well-known compressor equipment manufacturer planned to add data intelligence to their products and introduce real-time equipment monitoring, in order to implement precautionary alarms and trigger visits by maintenance and service personnel. An IoT solution helped operators to more efficiently manage their equipment, reducing downtime and improving competitiveness.

Solution Features

- All-in-one design simplifies cable runs and compact size conserves space, facilitating easy integration with environment
- Built-in edge processing reduces cloud data load and service fee

Customer Benefits

- Quick modification of rotational shaft speed or adjusting cutting tool configuration improves productivity and quality
- Vibration monitoring for shafts and bearings supports, upon detection of abnormality, immediate cease operations to avoid damage



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CNC Lathe Vibration Monitoring for Smart Cutting and Sawing



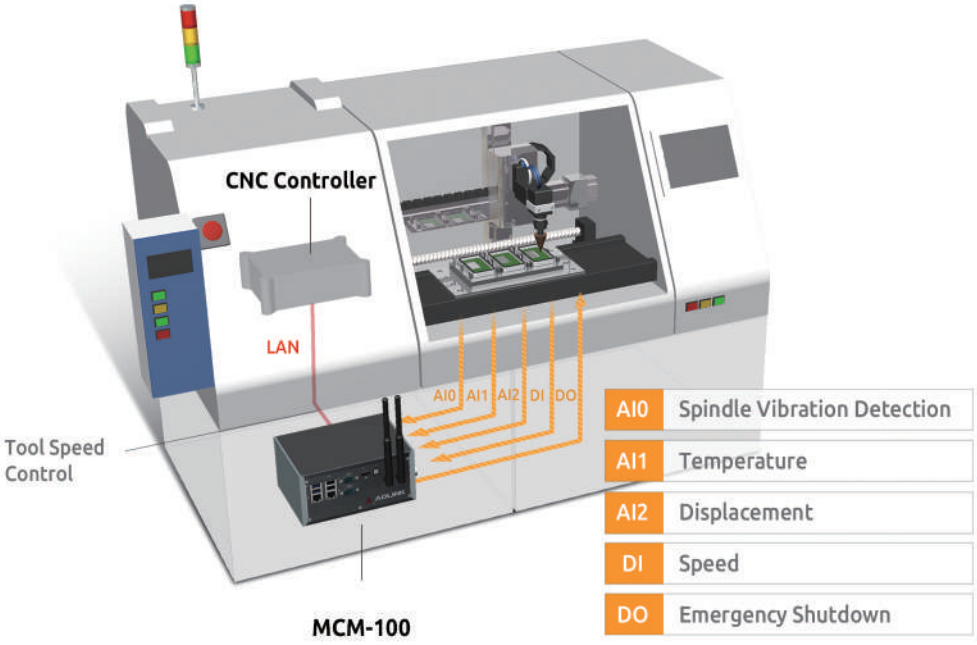
Continual monitoring of CNC lathe vibration allows monitoring of machine conditions and implementation of smart operations. An intelligent monitoring system does not need to wait for scheduled machine downtime to implement checkups, instead keeping an eye on machinery conditions during operations and allowing identification of developing problems, implementation of preventive maintenance, and prevention of unexpected machine failure and associated loss, thus improving processing quality and equipment availability.

Solution Features

- Non-intrusive installation avoids interrupted operations
- All-in-one system integrates functions of computing, data acquisition, and signal conditioning; modules simplify cable runs and physical installation, increasing time benefits and reducing costs

Customer Benefits

- Quick modification of rotational shaft speed or adjusting cutting tool configuration improves productivity and quality
- Vibration monitoring of shaft and bearing supports; upon detection of abnormality, immediate cease operations to avoid damage



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MCM Edge Platforms

Model Name	MCM-100/MCM-102
	
System Specification	
Processor	Intel Atom® x7-E3950 processor
Video	1x DisplayPort
Memory	DDR3L 1600 SODIMM 4 GB
Storage	Factory installed 128 GB mSATA SSD
Ethernet	2x GbE RJ45 (Intel® I210-IT)
Serial Port	2x COM (2 x RS-232/422/485)
USB	2x USB 2.0 + 2x USB 3.0
Mini PCIe	2x Mini PCIe card slots
Wireless Kit (optional)	Wi-Fi Kit
Power Supply	6 to 36 VDC
Power Consumption	System full load: 25W / Processor full load: 35.2W / USB port full load: 38 W
Vibration Measurement I/O Specification	
Channels	4CH (MCM-100) / 2CH (MCM-102)
Resolution	24-bit
Max. Sampling Rate	128 kS/s
Input Range	±10V
Input Mode	Diff/P-Diff
Input Coupling	AC/DC
IEPE Excitation Current	0 or 2mA (IEPE compliance: 24V)
Over-Voltage Protection	±60V
DC accuracy - Offset Error	Typical: ±0.15mV, Max. ±0.3mV
DC accuracy - Gain Error	Typical: ±0.15%, Max. ±0.3%
System Noise	50 μVrms
-3dB Bandwidth	0.49 x sampling rate
AC Cutoff	0.4Hz (-3dB), 2.4Hz (-0.1dB)
Flatness	±0.01 dB (20 Hz to 1 kHz)
CMRR	60 dB (20 Hz to 1 kHz)
Crosstalk	-100 dB
Dynamic Range	100 dB
SFDR	104 dB
THD	94 dB
THD+N	91 dB
Trigger Source	Analog or digital, software selectable
Trigger Mode	Post, delay, middle, pre-trigger, re-trigger
Auto-Calibration	Yes
DIO	2 programmable function I/O
Mechanical	
Dimensions	183 (W) x 110 (D) x 83.85 (H) mm
Construction	Full lower case
Mounting	DIN-rail / wall mountable
Environmental	
Operating Temperature	0°C to 55°C (32˚F to 131˚F)
Storage Temperature	-20°C to 70°C (-4˚F to 158˚F)
Humidity	approx. 95% @ 40°C (non-condensing)
Vibration	Operating 5 Grms, 5-500 Hz, 3 axes w/ mSATA SSD
ESD	Contact +/-4 KV, Air +/-8 KV
Shock	Operating 100 G, half sine 11 ms duration w/ mSATA SSD
EMC	CE & FCC Class A (EN61000-6-4/EN61000-6-2)

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Model Name	MCM-204
	
System Specification	
Ethernet (1Gb)	Two RJ45 Ethernet ports (1 IP, Ethernet cascade when power on)
NAND Flash (EMMC)	8GB
Memory	DDR3 RAM 1 GB
External Storage Option	USB flash disk
USB	2x USB 2.0
Power Supply	9 to 30 VDC power input
Isolation	1.5kV
Communication Interface	Web Console / RESTful API / C/C++API
Analog Input	
Resolution	24-bit
Number of Channels	4 (simultaneous, BNC type)
Maximum Sampling Rate	128KS/s, can be adjusted to 1KS, 2 KS, 4KS, 8KS, 16KS, 32KS, 64KS
Input Range (voltage)	±10V, no ±1.25V
Input Coupling	AC/DC
IEPE	4mA, compliance voltage +24V
Sensor Type	Vibration (IEPE sensor), temperature sensor, tachometer
Offset Error	± 0.1mV
Gain Error	± 0.05% of FSR
-3dB Bandwidth	0.43 x sampling rate
Flatness	± 0.01 dB (10Hz to 10K Hz)
AC Cut-off Frequency (-3dB)	0.4Hz
AC Cut-off Frequency (-0.1dB)	2.4Hz
Trigger Sources	Software, external digital, analog trigger, built-in button
Trigger Mode	Post trigger, delay trigger, retrigger
Overvoltage Protection	± 50V
Input Impedance	1 MΩ
Crosstalk	-100dB
Dynamic Range	-95dB
THD (1KHz)	-100dB
THD+N (1KHz)	-95dB
Isolated Digital I/O	
Digital Type	TTL input: 0~5V for DI / Open drain for DO
Number of I/O	4-CH DI/O (digital input and output can be configurable)
Input Logic Level	Logic low: VIL = 0.8 V max. / IIL = 0.2 mA max. / Logic high: VIH = 2.0 V min. / IIH = 0.2 mA max.
Overvoltage Protection	± 50V
Supporting Modes	• Static digital input/output • Tacho meter support • External digital trigger in
Mechanical	
Dimensions	110.5 (L) x 40 (W) x 126.5 (H) mm
Connector	4x BNC + 2x 6-pin spring-type terminal block
Front Panel LED	4
Chassis	Metal, IP30
Mounting	DIN rail, optional wall mounting kit
Environmental	
Operating Temperature	0°C to 60°C (32˚F to 131˚F)
Storage Temperature	-20°C to 70°C (-4˚F to 158˚F)
Humidity	approx. 95% @ 40°C (non-condensing)
Vibration	Operating 5 Grms, 5-500 Hz, 3 axes
ESD	Contact +/-4 KV, Air +/-8 KV
Shock	Operating 100 G, half sine 11 ms duration
EMC	CE & FCC Class B (EN61000-6-4/EN61000-6-2)
Safety	IEC 61010-1, IEC 61010-2-201 (pending)

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