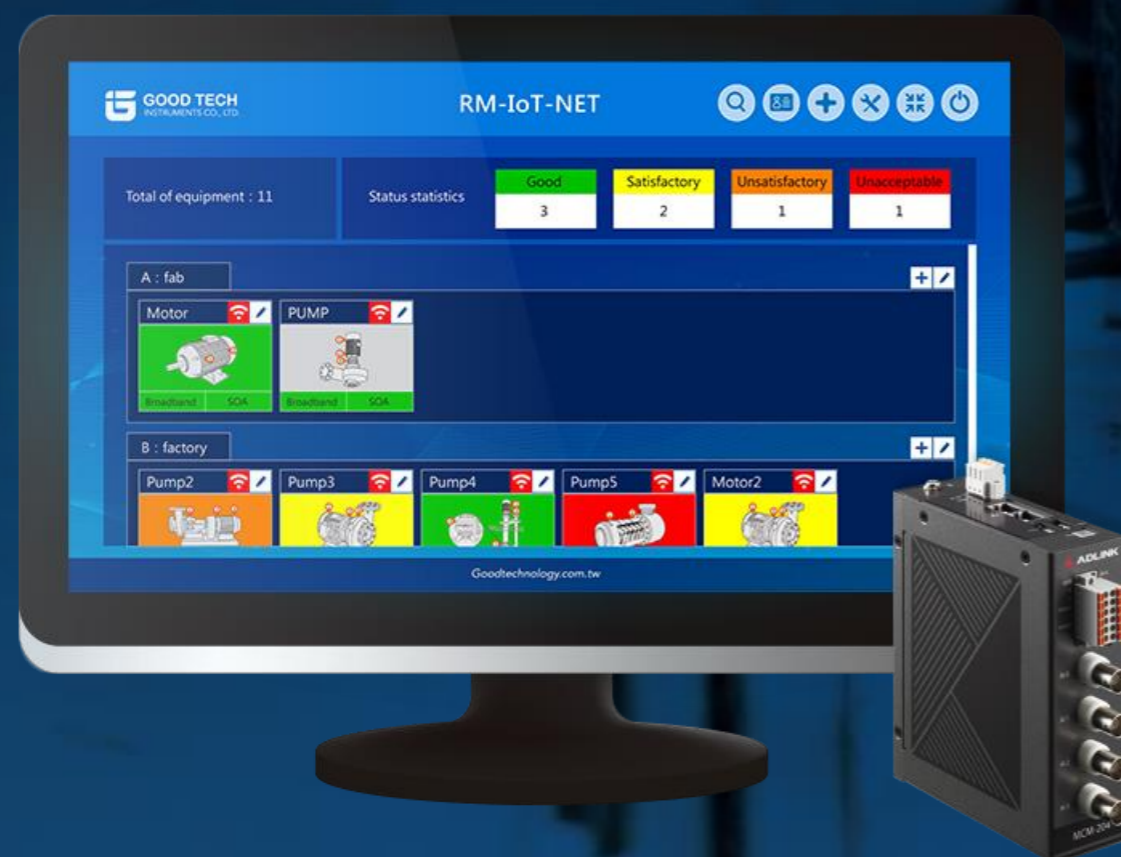




RM-IoT-NET

Online Rotor Vibration Monitoring System
Daisy-chain technology



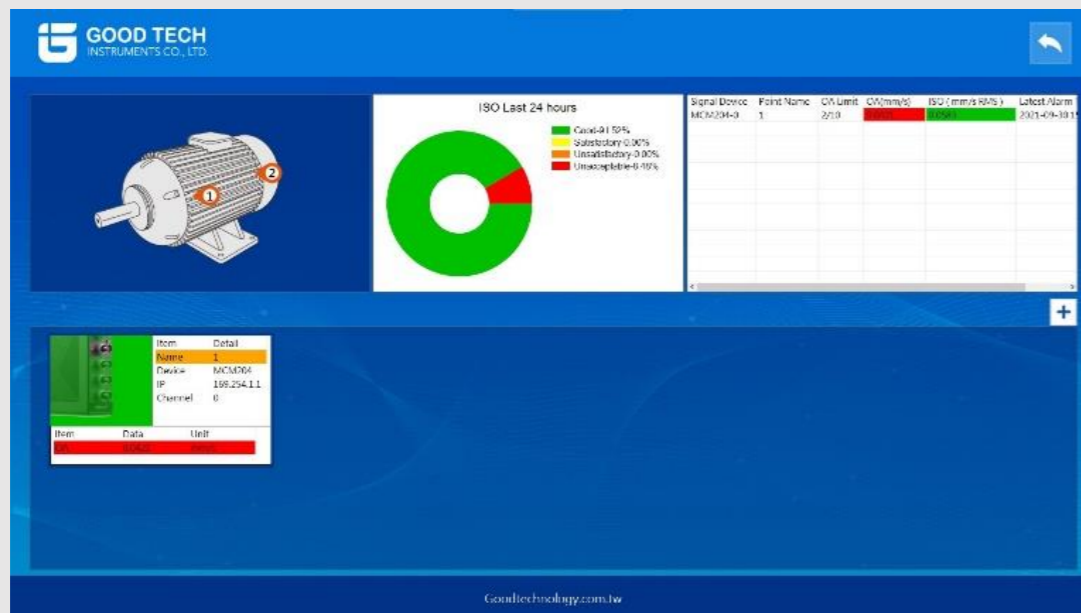
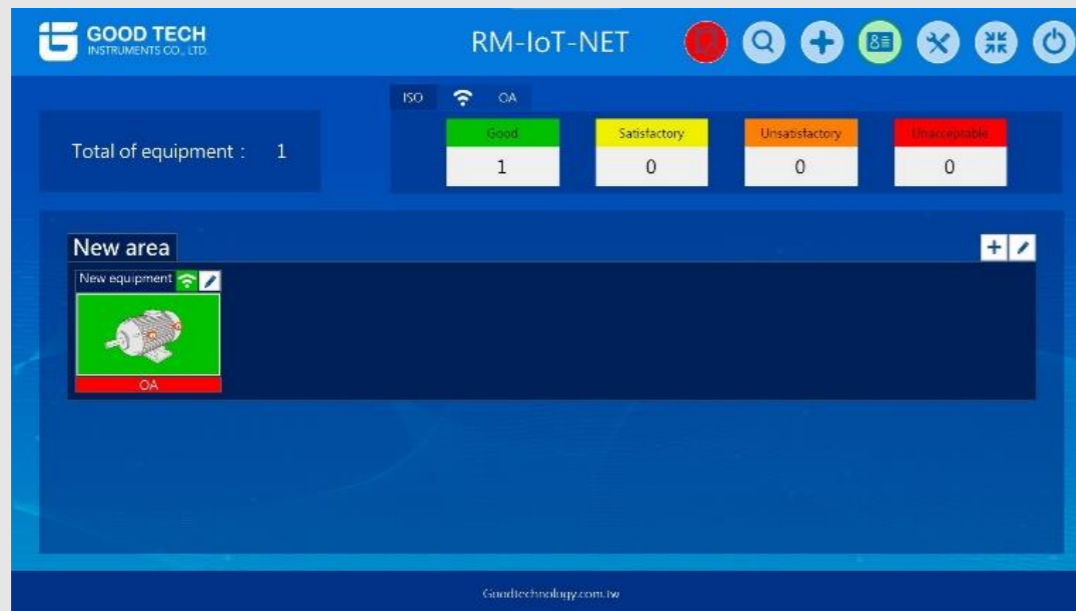
Risk Stratification Management

- Rotor Quality
- Vibration Anomaly
- Symptom Diagnosis

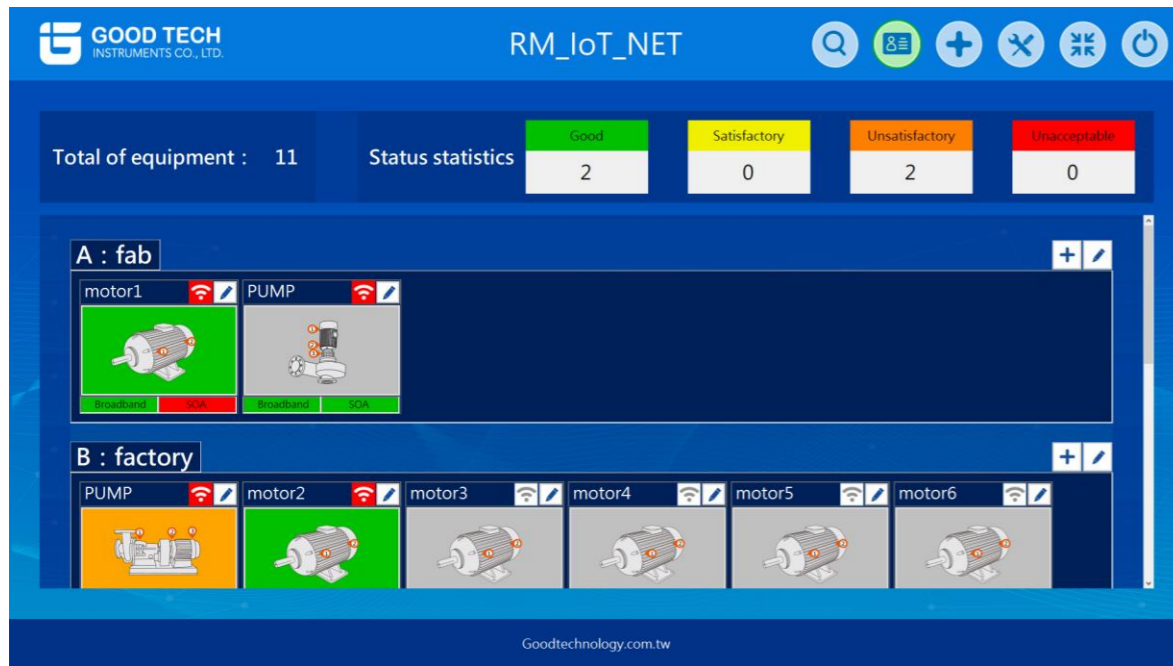
Value-driven predictive maintenance system

Situation Room, at a glance!

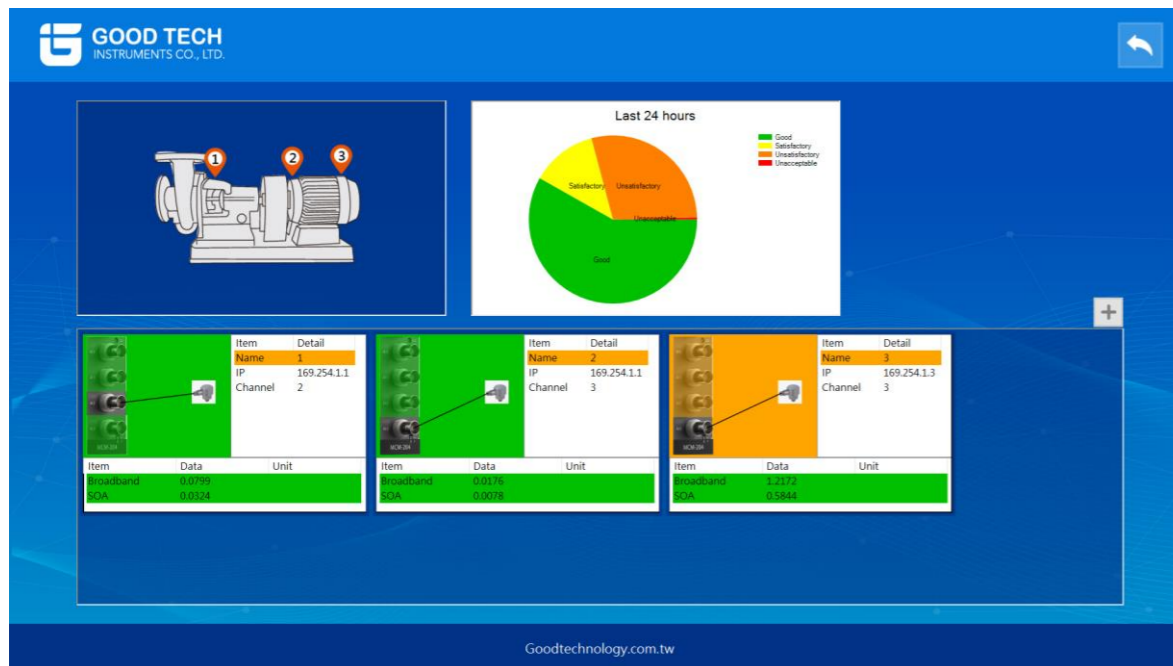
All views are configurable. RM-IOT-NET possesses tools at the control console to visualize Dashboard, Pie chart, Tabular summary, Real-time FFT / time waveform, ISO criticality trend, OA criticality trend, vibration variation criticality trend, SOA criticality trend. A scientific database leads to decisive investigation and correction.



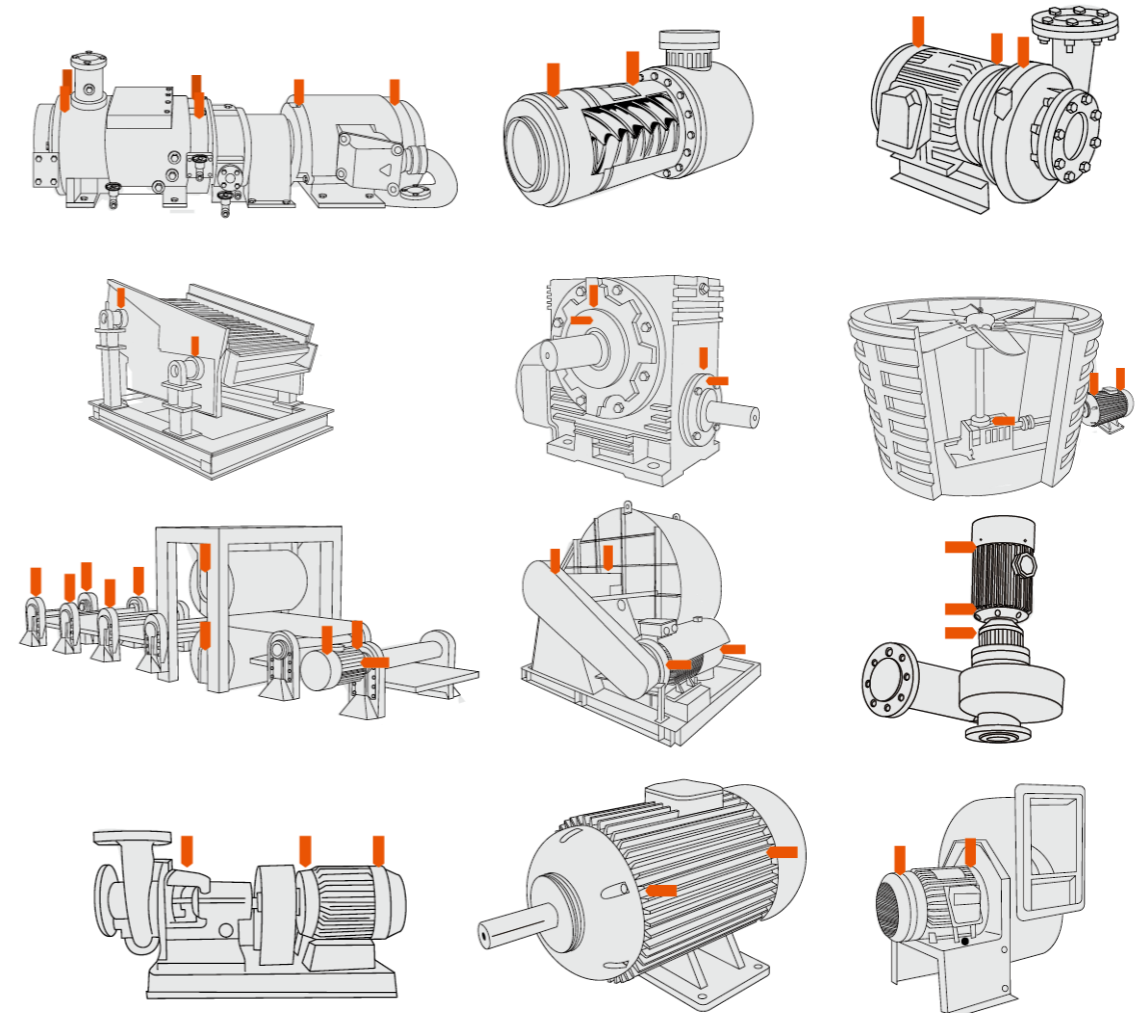
UI features



Increase Areas and Equipment with flexibility

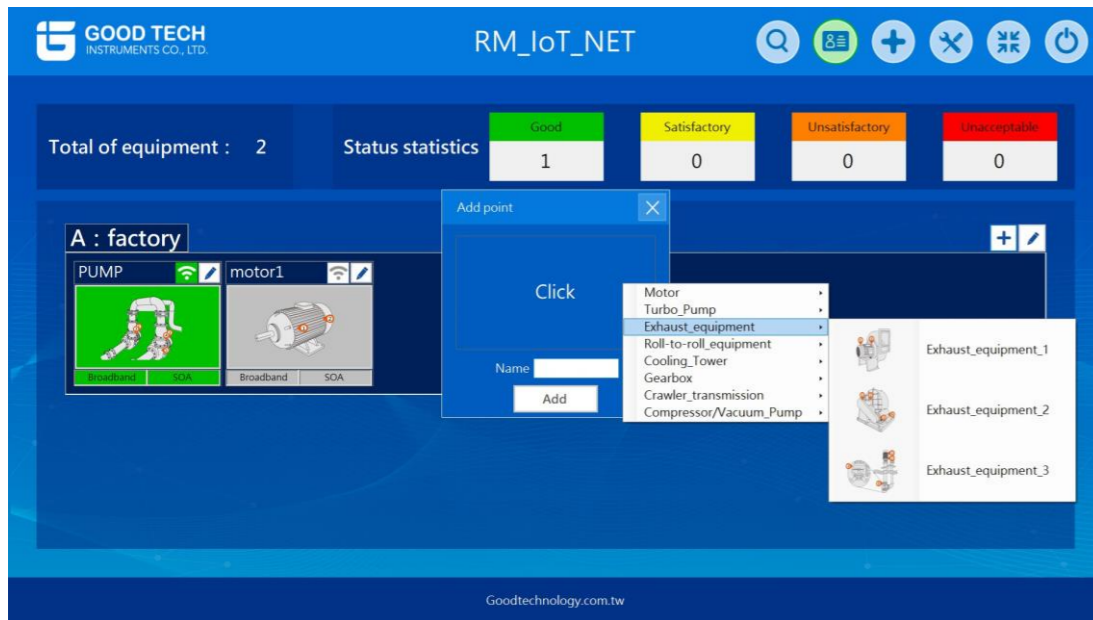


Graphical health result display

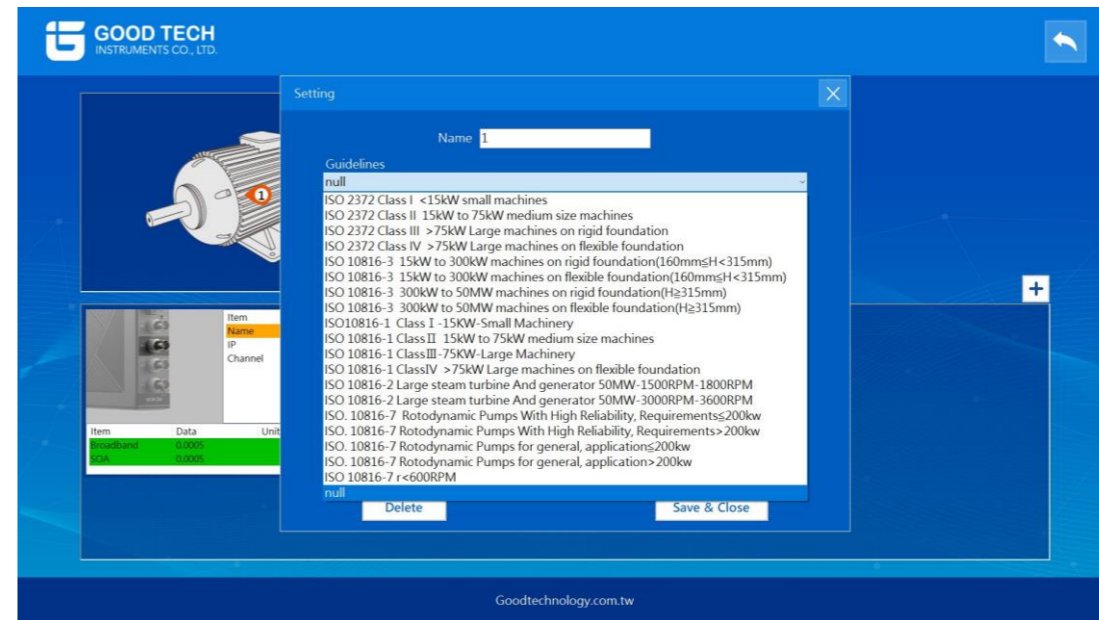


Built-in measurement points of multiple equipment

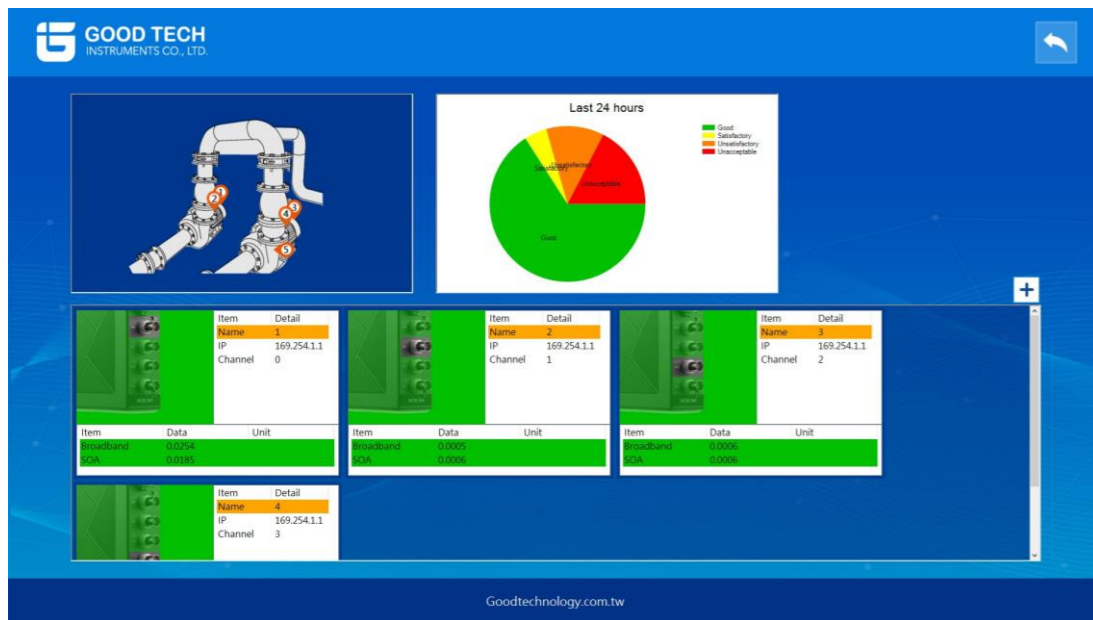
Simplicity of setting, 4-step only!



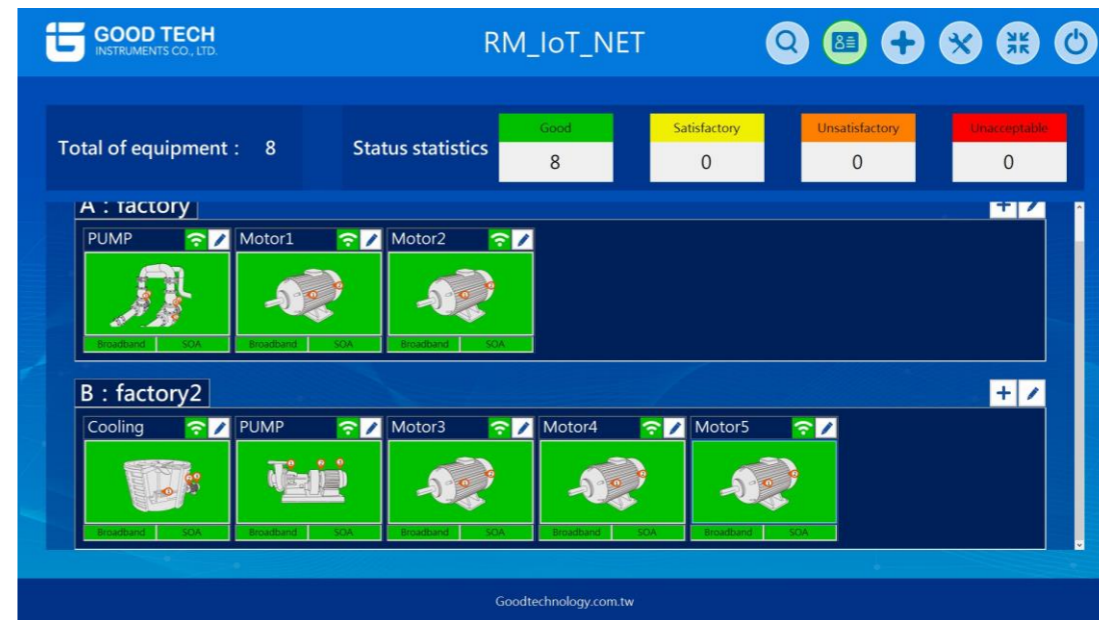
1. Increase machine types



3. Choose respective regulation



2. Define measurement devices & points



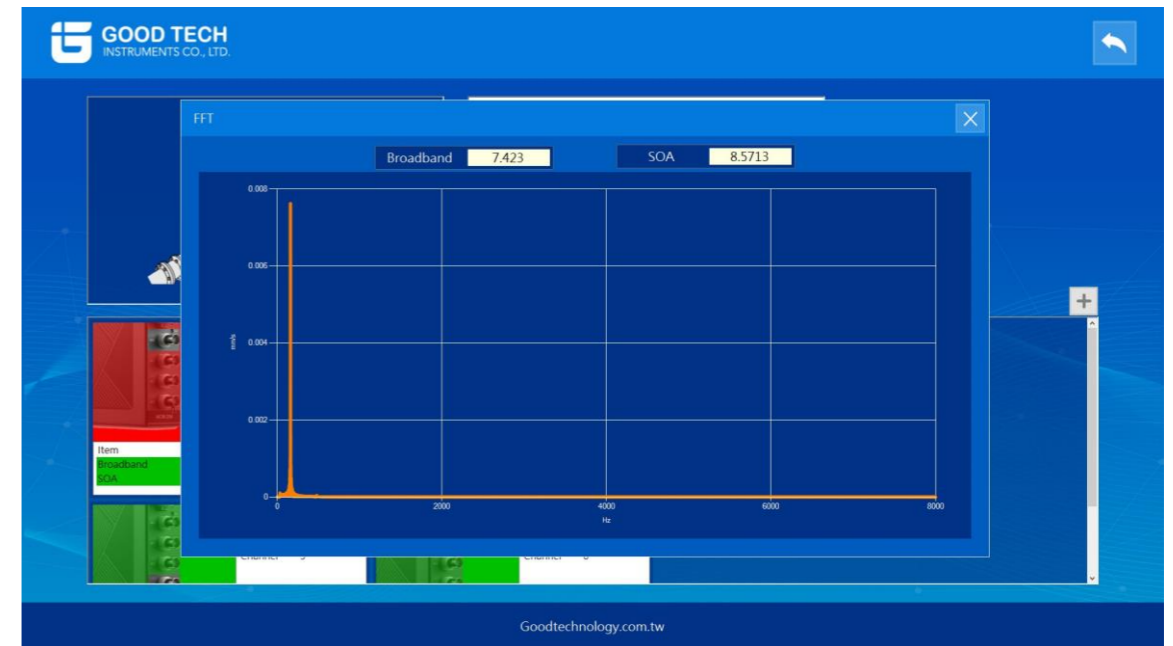
4. Online monitoring get started



Data display & advanced analysis



Data trend display



Real time FFT



RM-IOT-NET case study

Online Rotor Vibration Monitoring System

Daisy-chain technology

Fab / Sub-Fab Dry pump in Semicon Industry

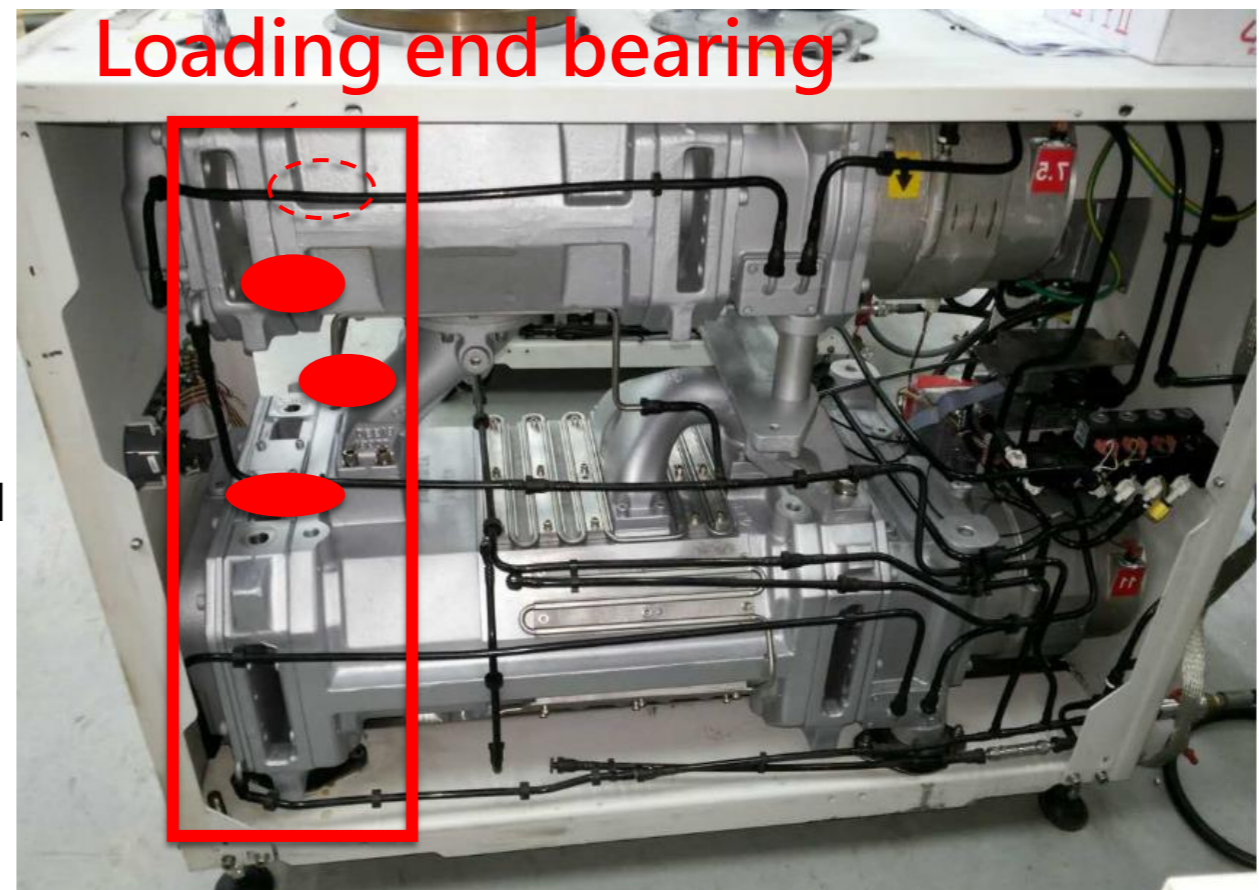
Goodtechnology.com.tw



12" LPCVD furnace measurement points

Model : EDWARDS IXH3030T

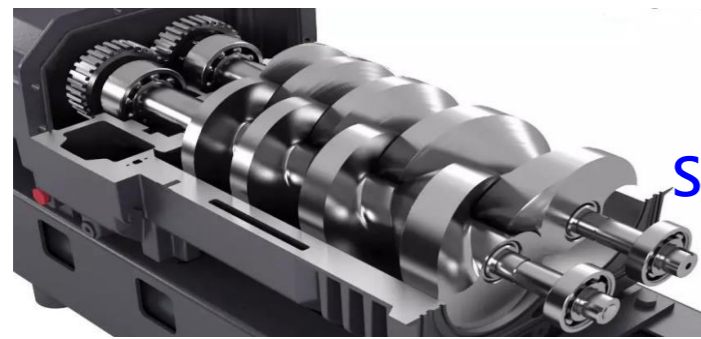
Measure Purpose: inspect bearing quality on the BP(bearing point) & DP(driving point) of Dry Pump



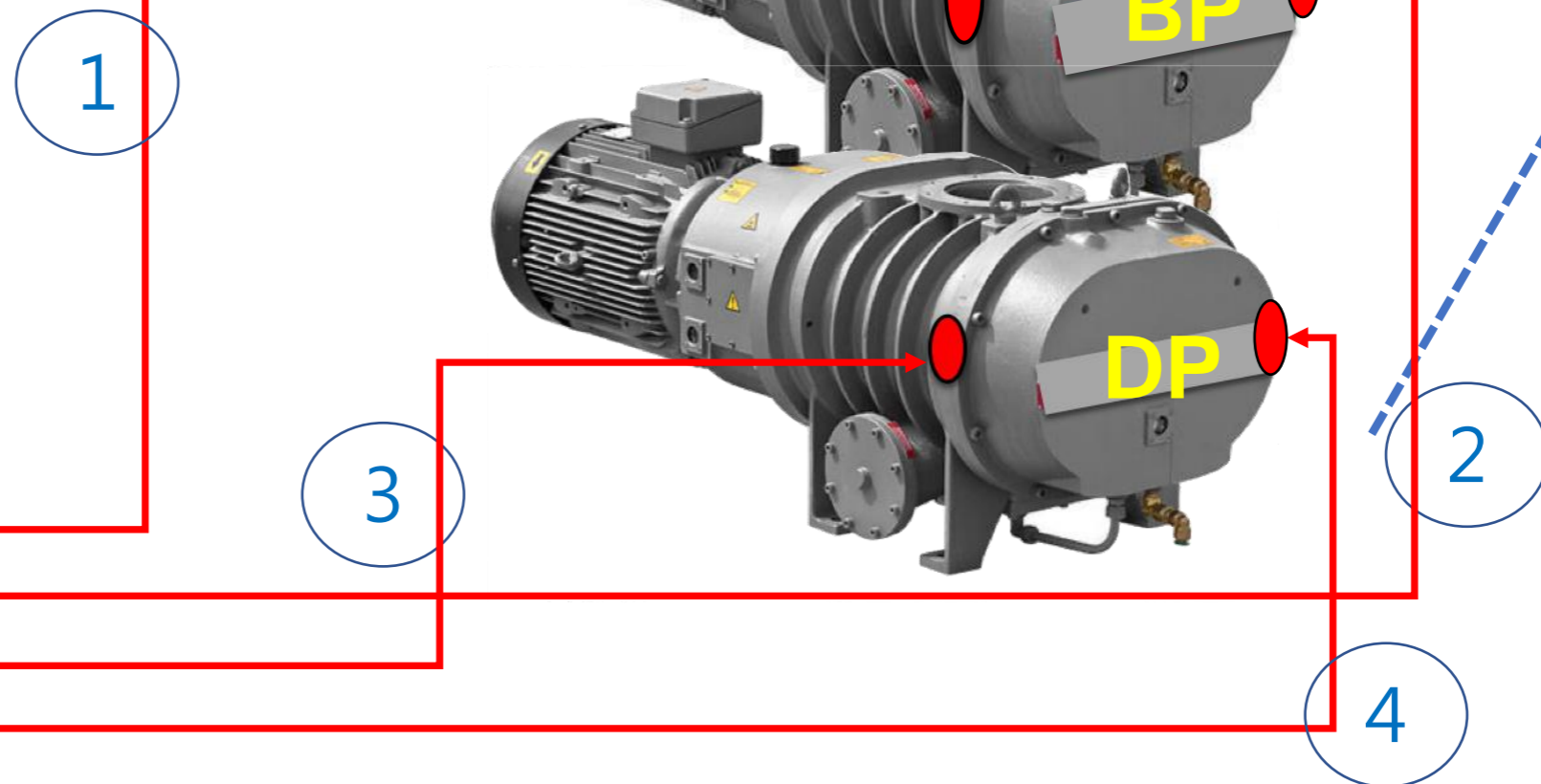
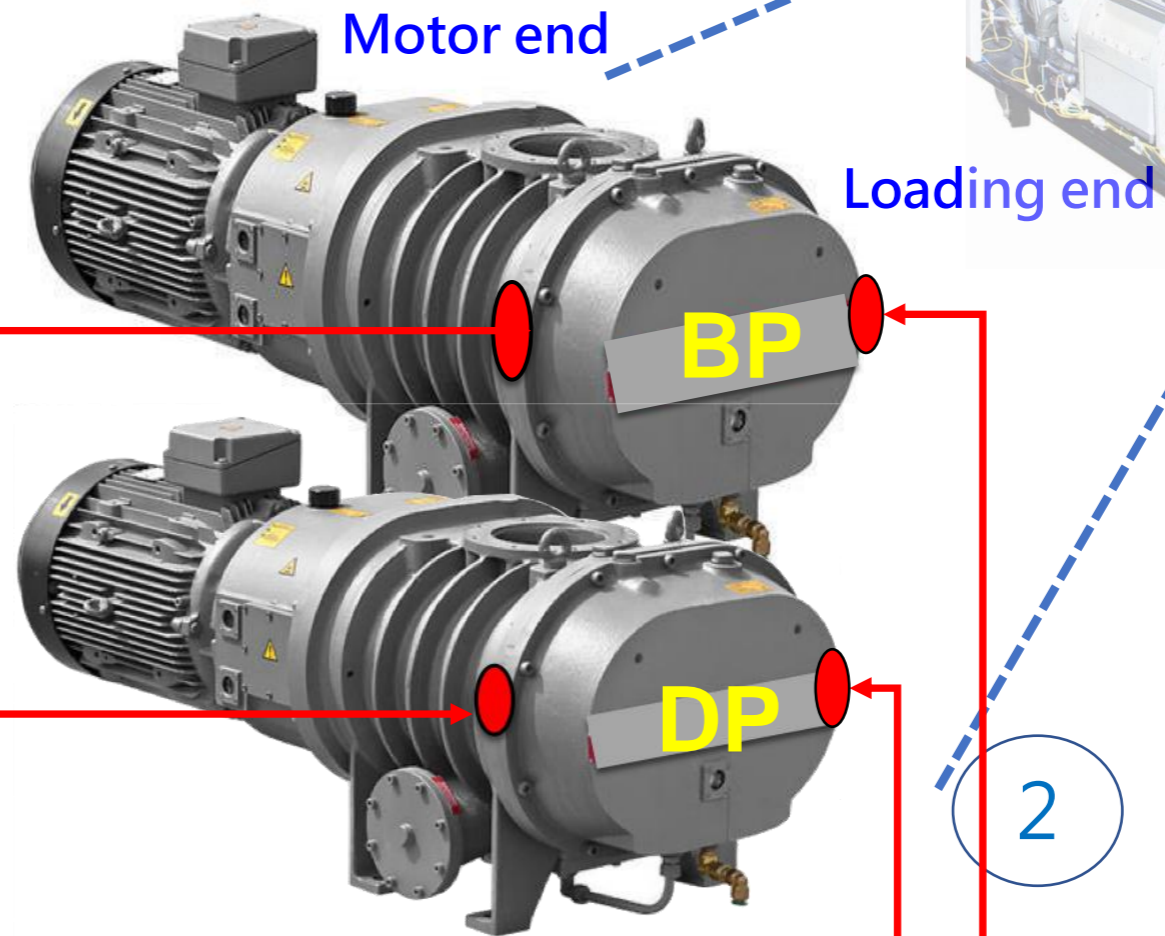
Goodtechnology.com.tw



Measurement point recommendation



Shaft 2
Shaft 1

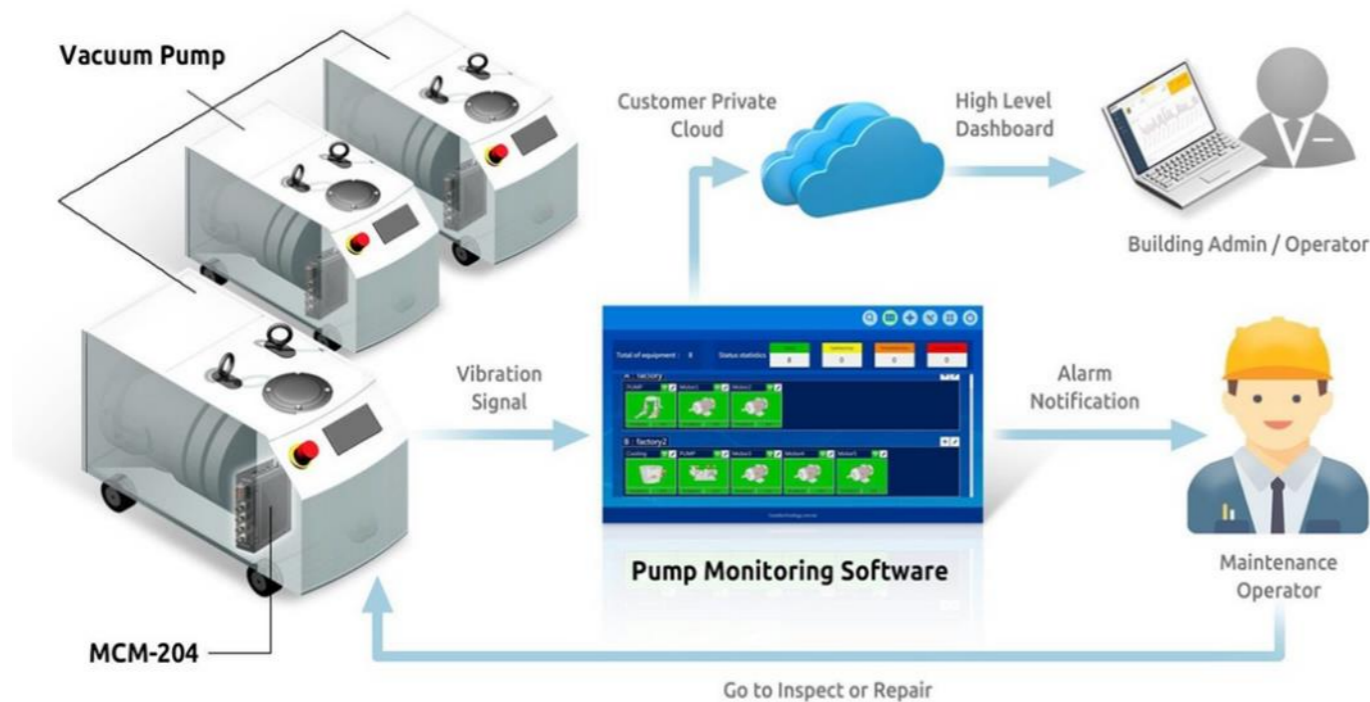


RM-IOT-NET monitoring structure on Dry Pump

Why do we need to monitor the Subfab vacuum systems in Semicon Industry?

The answer is easy to see, cause the wafer making cost is extremely high and totally worthy to do. Despite the unbelievable high price of equipment, the manufacturing is also complex and multi-processing. If manufacturers can do it once, they will never waste **human resources**, **machine utilization** to risk for the **low and unstable yield rate**.

In Semicon, the Subfab systems connect to the crystal furnaces. If the vacuum systems don't run consistently and efficiently, which will impact the wafer quality.



Features in

- Scalability
- Flexibility
- Simplicity
- Ease of maintenance

One ethernet port can support up to **255 Dry pumps**.
Each dry pump needs **4 measurement points**.

Goodtechnology.com.tw



Case Study

➤ Pain point:

Ensuring peak performance is critical to semiconductor manufacturing in pursuing wafer production quality and yield. Take 12" wafer for example, if the dry pump of the **low pressure chemical vapor deposition (LPCVD)** system or **ion implanter** used in the diffusion process provides insufficient vacuum or fails, causing back pressure to push air and foreign particles into the chamber, the entire run of wafers may need to be scrapped and the **loss is up to 330 thousand US dollars per batch.**

Tracking **pressure, flow, temperature and electrical current** is normal to see. However, they are all **lagging indicators** that can't predict early faults.

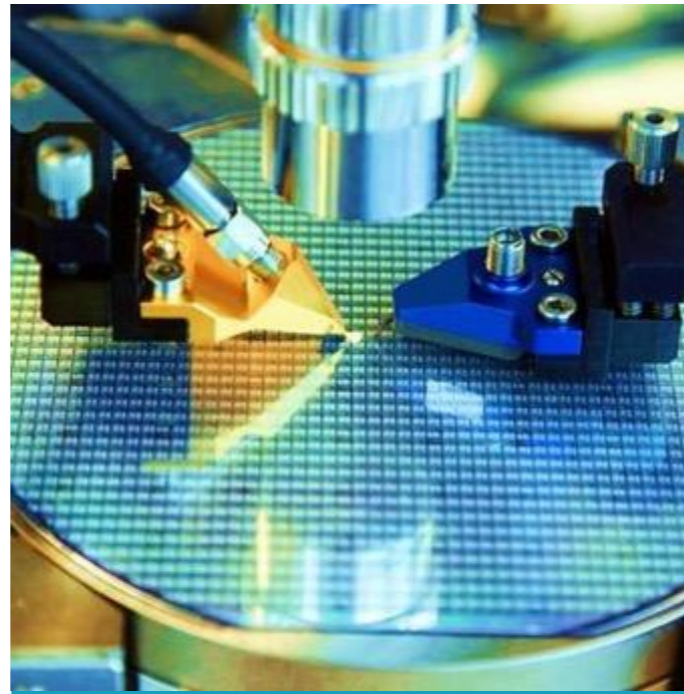
Some users tend to schedule service plans based on a regular time interval or predetermined operating hours. However, they need a scientific reference to ensure every call service is necessary and a precise acceptance check to secure return quality.

➤ Solution:

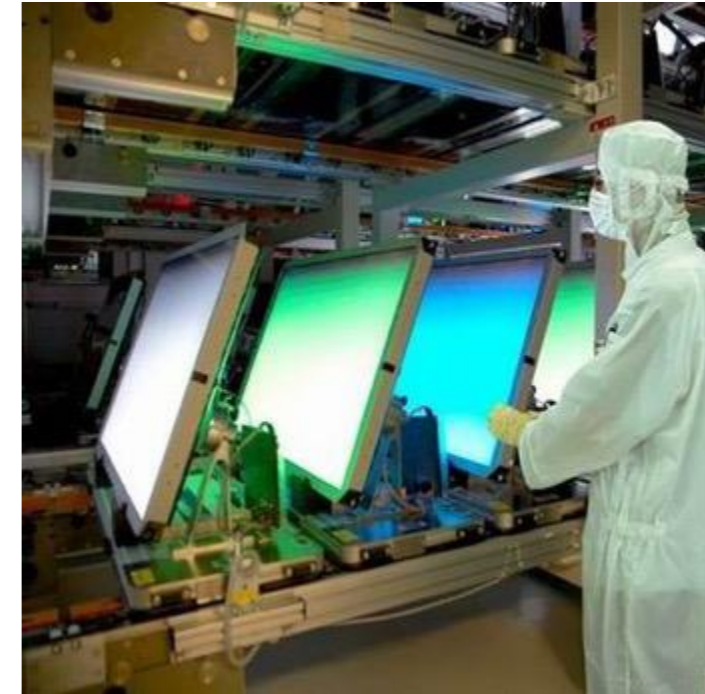
RM-IOT-NET translates vibration signals into intuitive indicators allowing for easy review, providing valuable insights into device condition, and helping users to spot the most minor signs of equipment failure in the very early stages of development. Users can thus predict equipment health and lifetime more precisely and implement more reactive and responsive management in their efforts to bring down operation and maintenance costs.



Semicon Crystal Growth



Semicon Foundry



Panel making

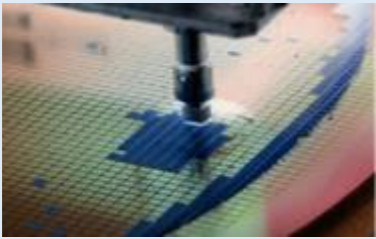

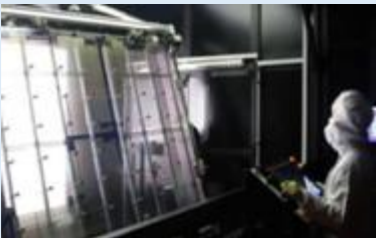



Sub-Fab Vacuum System



Various Vacuum System for manufacturing

Rotating equipment monitoring demand

Field	Application	Trend
Semicon 	<ul style="list-style-type: none"> Vacuum system (Dry pump 、 Turbo pump) Rotating machine monitoring (water 、 air 、 electricity 、 HVAC) Grinding equipment Spin coating equipment <p><i>Focus: Product defect defense</i></p>	<ul style="list-style-type: none"> 12" wafer : high integrated, precise manufacturing, high value, wafer price increasing 8" wafer : IOT demand increasing, highly competitive, high yield rate equals to high order amount
Petrochemical 	<ul style="list-style-type: none"> Cooling system Mixing system Conveyor system Exhaust system <p><i>Focus: capacity maintain, safety issue, environmental friendly</i></p>	<ul style="list-style-type: none"> Automation declines labor-consuming operation Data digitalization, machine health trend management
Panel 	<ul style="list-style-type: none"> Vacuum system (Dry pump 、 Turbo pump) Rotating machine monitoring (water 、 air 、 electricity 、 HVAC) Grinding equipment Spin coating equipment <p><i>Focus: downtime prevent, Product defect defense</i></p>	<ul style="list-style-type: none"> Highly competitive, high yield rate equals to high order amount Gross profit goes down, review the rework and scrap fee to keep the profit Data digitalization declines labor-consuming operation
Manufacturing & processing (Food, beverage, pharmaceutical) 	<ul style="list-style-type: none"> Rotating machine monitoring (water 、 air 、 electricity 、 HVAC) Mixing system Conveyor system <p><i>Focus: Inspection human resource decline, downtime prevent</i></p>	<ul style="list-style-type: none"> Automation declines labor-consuming operation Data digitalization, machine health trend management

Target Assets in Semicon Industry



Crystal Growth



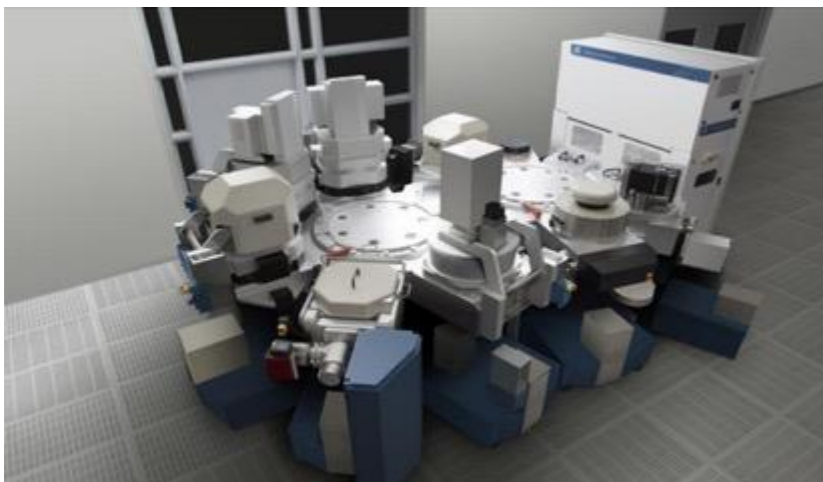
LPCVD furnace



Ion implanter



CVD Producer



PVD Sputter



Dry Etch



Slit Coater

Testimony in various vertical markets

Upstream Semicon (Crystal Growth)	Midstream Semicon (Logic & Memory IC manufacturing)	Downstream Semicon (Test and Package)	PCB Industry	Panel Industry	Automation Industry	Petrochemical & Conventional manufacturing	Machine Tool

Key customers of research institute					
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