

## Have you given up on the predictive diagnostics of facility failure?

Detect signs that occur when a solid is deformed or damaged

- Elastic waves (AE waves) generated when a solid is deformed or damaged are captured and signs before facility failure worsens are detected to prevent the operation from stopping. (**predictive detection**)

Promoting production site improvement

### ➤ Consider installing new Sine wave sensors

- To prevent a sudden failure.
- To monitor the deterioration of the facility and equipment.
- Understanding optimum maintenance timing.

### ➤ Other sensors have already been installed but...

- The sensor output fluctuates due to the influence of the ambient environment (temperature/noise).
- It is difficult to detect sudden events.
- Adding sensors to the existing system is difficult.

## Features

**Four features** for effective solutions

No.	Features of Sine wave AE sensors
1	<b>Frequency characteristics</b> that are not easily affected by noise.
2	<b>Output damping characteristic</b> that can easily detect sudden events.
3	<b>I/O characteristics</b> that can easily determine normal/abnormal operation.
4	<b>Temperature characteristics</b> that are not easily affected by temperature.



## Example: Maintenance of the robot arm reduction gear (bearing)

### Issues

- Determining when the reduction gear should be lubricated by collecting and analyzing the lubricant of the reduction gear. (Reducing unnecessary maintenance)
- If maintenance is delayed, the reduction gear fails.
  - ▶ The line will stop.

### What you want to achieve

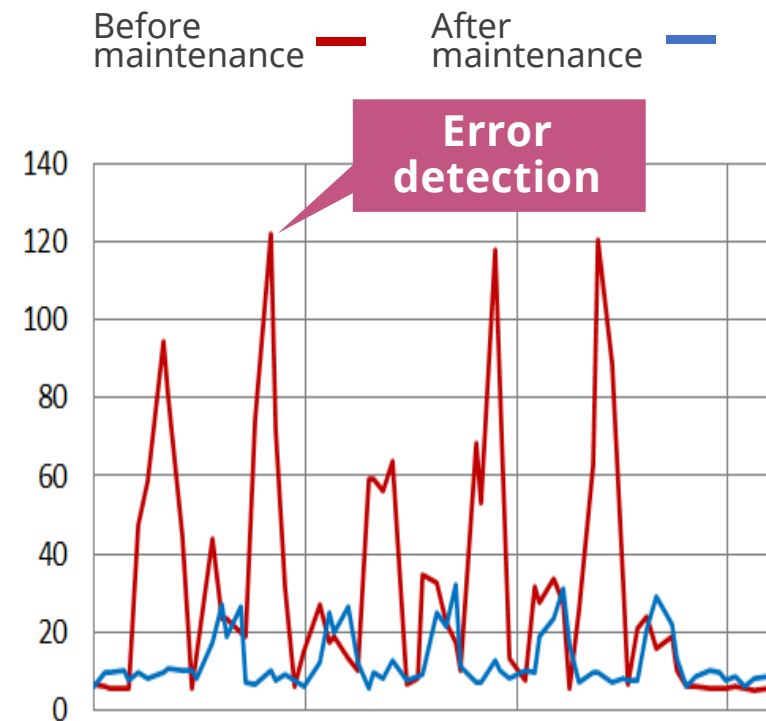
- **Determining when maintenance should be carried out without relying on the experience of skilled workers.**

### Solutions

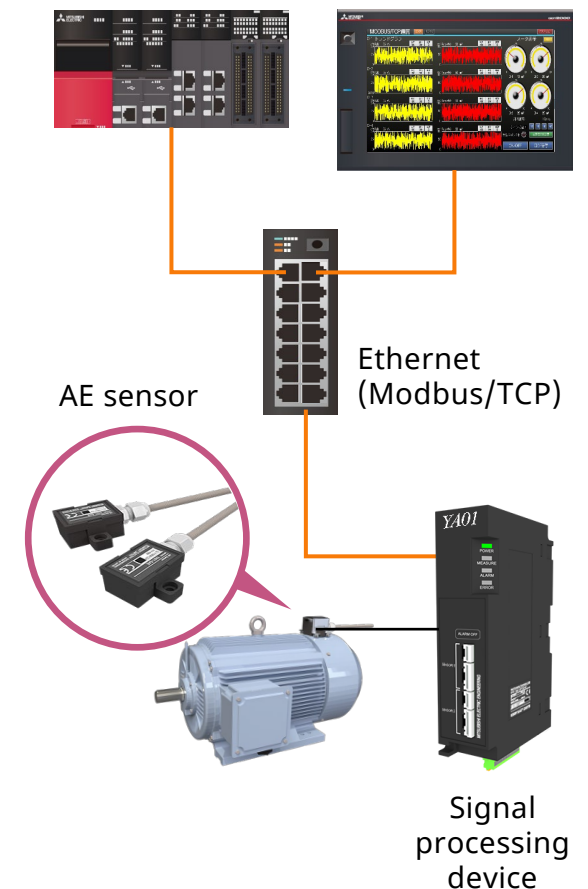
- ▶ Compare and analyze the data before and after maintenance **to check the relationship between the output and the status of the sensor.**
- ▶ Monitor the output value of the AE sensor to grasp that the maintenance timing is approaching. (**Maintenance can be performed at the required timing.**)

## Concept

- Measurement value before and after maintenance (lubrication)



- Configuration



## Is analog sensor data collected effectively?

### Start small by visualizing the facility with analog sensors

- Integrated management of operation data from analog sensors such as temperature, humidity, and flow rate using an analog signal converter and network interface module.

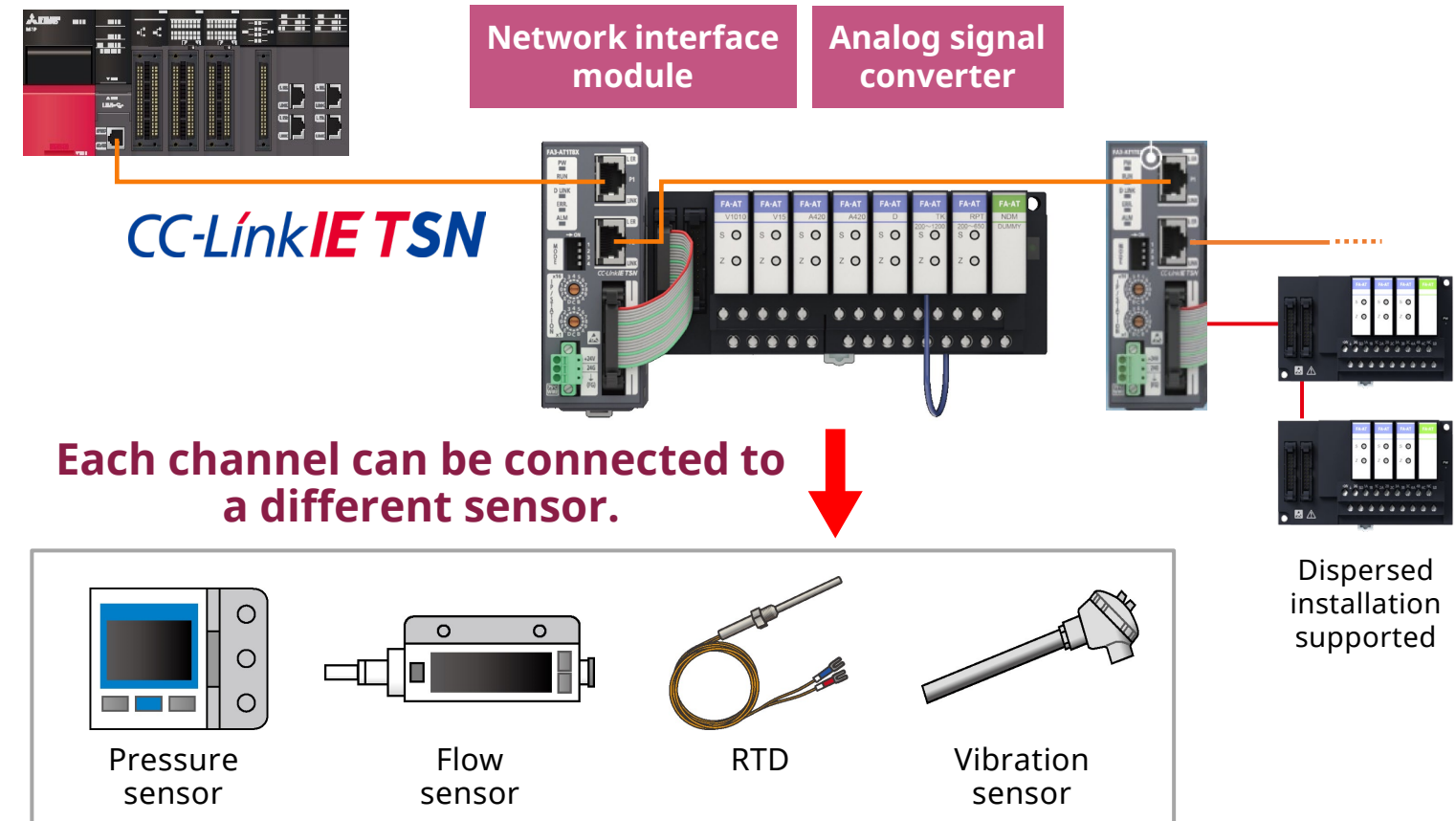
### Optimal configuration using an analog signal converter

- The optimal module for existing analog sensors can be selected for each channel. The device configuration is optimized without unused channels being left.

### Issues with existing facility

- Working hours/production lags due to periodic visual inspection
- Human errors when data is manually input
- We are too busy with daily facility maintenance
- Many sensors are installed in the facility

## Concept



Internet of Things (IoT)  
helps improve the facility!



## Case: Cost and time saving for temperature sensor data collection

**Issue** Operators need to check sensors installed around the line visually several times a day

### What you want to achieve

- The optimization of human resources through the integrated management of sensor data.
- Analysis, measurement, prediction, and detection of facility failure using data logging.

### Solutions

- **Integrate sensor data management** by connecting an analog signal converter via a network.
- Detect signs of facility failure to **prevent operations from stopping**.
- **Real-time monitoring** on a tablet with GOT Mobile.
- **Zero rework** due to human error.
- **GENESIS64® screen design** is also possible.

## Image of a production line

