TECO Group

2019

Smart
Machine Health Management (MHm) System

Product Catalog

Content

Position

Factory automation has been in existence for many years, and the two main tools available are ERP and MES. However, there are other major assets in the factory, that is, mechanical and electrical equipment for production and service, which is not covered by existing ERP and MES.

The company's Smart Machine Health Management Platform (MHm) is aimed at the health management of the plant's electromechanical equipment, automating equipment maintenance and greatly improving the efficiency of factory maintenance.

ERP
Management
Efficiency

FA
Factory
Automation

MES
Productivity

MHm
Maintenance
Efficiency
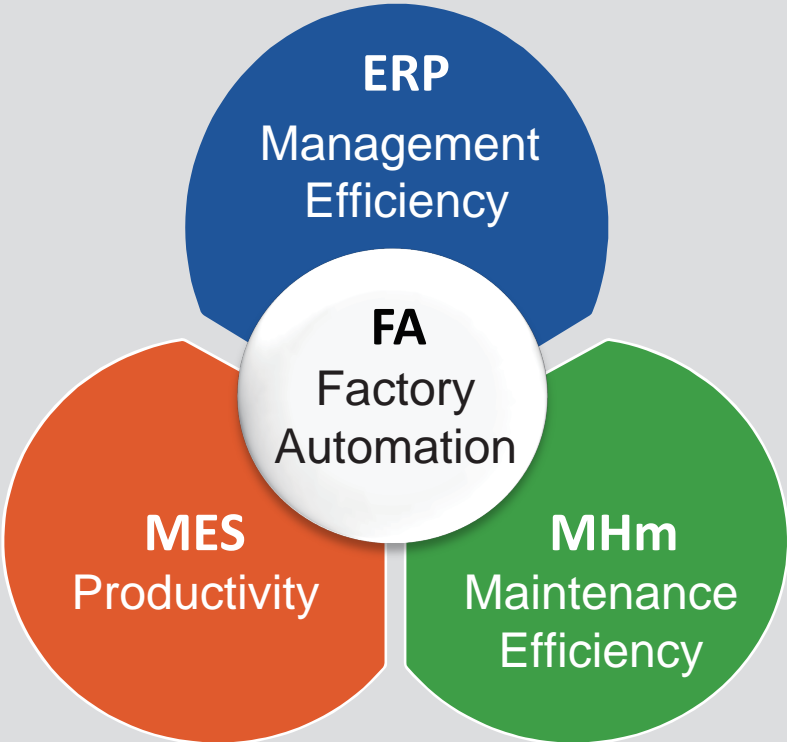
This platform is as important
to the operation
of the plant
as ERP and MES.

Overview

TECO introduces the "All Smart Machine Health managing platform (MHm), an innovative and advanced solution for machine operation status management.

It uses MEMS (Micro Electrical Mechanical Sensor) sensors and the advanced-IoT (Internet of Things) communications technology to provide remote, mobile, real time, interactive functions between any machine and remote smart phones.

These functions are not possible for conventional SCADA systems or web-based on line monitoring systems. In a way, the MHm can be loosely considered as an advanced mobile SCADA.

In a factory…

There exist machines that are mission-critical and cannot afford to fail. These machines need constant monitoring and trending alerts. There are less critical machines but still need periodic health management to reduce unexpected shut down.

The TECO MHm platform comes with two product packages for the two different applications:

MMK/MHm   **Pro-3200**

The Two Product Packages:

1. The MMK (Mobile Maintenance Kit), long-term monitoring:

- The Kit is installed long-term on a machine, reports the machine operational status every second on 24-7 basis, using IoT technology to work with remote smart phone, providing real-time monitoring, alarming, and interactive diagnosis.

2. Another product package is Pro-3200, on-site measurement:

- The Pro-3200 is a portable instrument for machine vibration measurements and diagnosis.

- It is used on routine measures of machine in a factory and can automatically save, file and establish Big-Data-capable Vibration data-base of all machines in the factory.
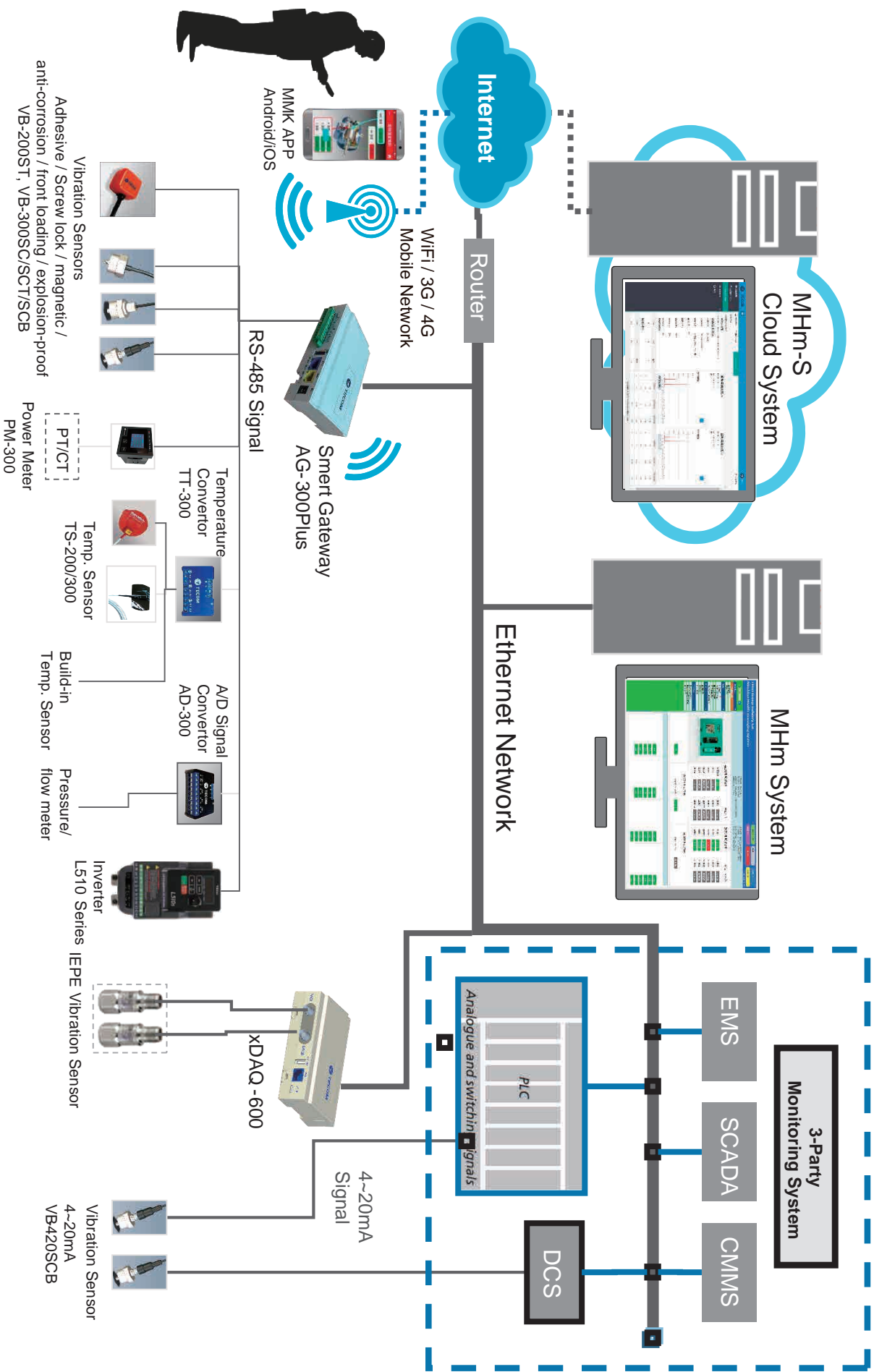
The two product packages are designed to complement each other.

The MMK is used for long-term health management of critical machines (maybe 10% in the factory) that cannot afford to fail.

For the rest of 90% machines, the Pro-3200 is used to do routine checks, save the measured data and establish vibration data-base of all machines in the factory. As the data-base is updated routinely, after a while the Big-Data algorithm will be able to give predictions on which machines are likely to fail, when and how.

Together with the MMK, the health of all machines in the factory are covered, at optimum cost.

Vibration Sensors
Adhesive / Screw lock / magnetic /
anti-corrosion / front loading / explosion-proof
VB-200ST, VB-300SC/SCT/SCB

MMK APP
Android/iOS

Internet

WiFi / 3G / 4G
Mobile Network

Router

RS-485 Signal

Smert Gateway
AG-300Plus

MHm-S
Cloud System

Power Meter
PM-300

PT/CT

Temperature
Convertor
TT-300

Temp. Sensor
TS-200/300

A/D Signal
Convertor
AD-300

Build-in
Temp. Sensor

Pressure/
flow meter

Ethernet Network

MHm System

Inverter
L510 Series

IEPE Vibration Sensor

xDAQ -600

Analogue and switching signals

PLC

4~20mA
Signal

Vibration Sensor
4~20mA
VB420SCB

EMS

SCADA

CMMS

DCS

3-Party
Monitoring System

MHm System Architecture Description

- This architecture provides different designs for the factory and Setmaker
    - * Designing MHm for the factory (near-end machine health management system)
    - * Designing MHm-S (cloud machine health management system) for Set maker, providing Private Cloud/Public Cloud selection
    - * MHM-S is mainly based on motor + air compressor, and will be extended to other industries the in future (example: water pump, ice water machine..)

- Provides full range of vibration gauges: VB-200, VB-300, explosion-proof

- Provide a comprehensive smart gateway: AG-300, xDAQ-600 + high frequency piezoelectric vibration gauge

- Provide VB-420SCB: 4~20mA analog vibration sensor, directly connected to the customer's current PLC/DCS system

- Complete machine health management system solutions (Sensors – Gateway – MHm System – Cloud), covering high and low frequency vibration, temperature, pressure/flow, electrical energy and frequency converters... such as machine health parameter monitoring management.

- Provides the interface between the gateway AG-300 and the customer's SCADA system.

- Fully in line with the Industrial Internet of Things IIoT, you can receive real-time alarms, instant information, and analysis and diagnosis through the MMK APP on your mobile phone.

MHm System Component Description

■ **Vibration measuring products :**

VB-300ST : Industrial grade, stick-type, stainless steel, triaxial vibration gauge (with cable), RMS & FFT for speed & acceleration, displacement output, 316L stainless steel body, industry standard RS-485, build-in cable (PVC).

VB-300SC : Industrial grade, screw lock-type, stainless steel, triaxial vibration gauge (with cable), RMS & FFT for speed & acceleration, displacement output, 316L stainless steel gauge, industry standard RS-485, built-in cable (PVC).

VB-300SCB : Industrial grade, screw lock-type, stainless steel, triaxial vibration gauge (separation cable), speed & acceleration RMS & FFT, displacement output, 316L stainless steel gauge, industry standard RS-485, separate cable.

VB-300SCT : Industrial grade, screw lock-type, stainless steel, triaxial vibration gauge (with Teflon cable), RMS & FFT for speed & acceleration, displacement output, 316L stainless steel gauge, industry standard RS-485, built-in cable (Teflon).

VB-420SCB : Industrial grade, screw lock-type, stainless steel, single-axis vibration gauge (separation cable), speed RMS output, 316L stainless steel gauge, industry standard 4~20mA signal, separate cable.

VB-200ST : Industrial grade, stick-type, triaxial vibration gauge (with cable), speed & acceleration RMS, industry standard RS-485, built-in cable (PVC).

MHm System Component Description

■ **Temperature measurement products:**

TS-200 : Adhesive temperature sensor, PT100Ω, measuring temperature -15°C~+150°C, measuring accuracy DIN IEC 751 Class B. ± 1°C.

TS-300 : High-precision adhesive temperature sensor, PT100Ω, measuring temperature -30°C~150 °C, measuring accuracy DIN IEC 751 Class B. ± 0.5°C.

TM-100 : Magnetic temperature sensor, PT100Ω, measuring temperature -30°C~150 °C, measuring accuracy Single DIN IEC 751 Class A.

■ **Smart Gateway :**

AG-300Plus : Mobile Maintenance Kit (MMK) Smart Gateway, RS-485, LAN/WAN/WiFi Support

■ **Smart meter :**

PM-300 : Smart multi-function three-phase meter, voltage / current / power / power / energy, RS-485 Modbus support.

■ **Signal converter :**

TT-300 : Temperature sensing signal converter, 3 ports of PT100 temperature signal input, 1 port of digital RS-485 signal output.
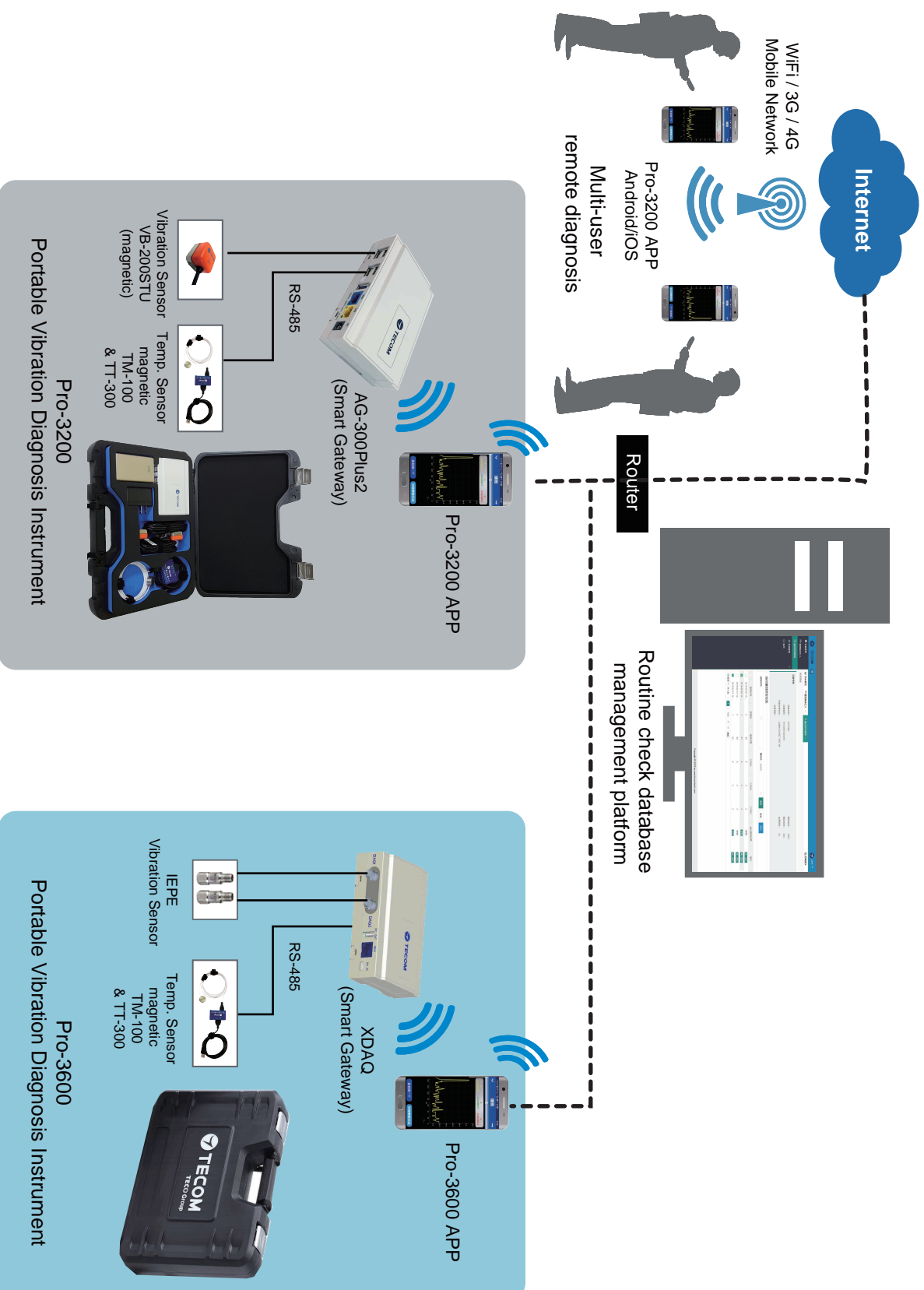
AD-300 : Analog-to-digital signal converter, 3 ports of 4-20mA and 1 port 0-10V analog signal input, 1 port of digital RS-485 output.

■ **Smart machine health management system platform**

Pro-3200

(Portable Vibration Diagnosis Instrument)

Portable Vibration Diagnosis Instrument Component and Connection

Internet

WiFi / 3G / 4G
Mobile Network

Pro-3200 APP
Android/iOS

Multi-user
remote diagnosis

Router

Routine check database
management platform

Pro-3200
Portable Vibration Diagnosis Instrument

Vibration Sensor
VB-200STU
(magnetic)

Temp. Sensor
magnetic
TM-100
& TT-300

RS-485

AG-300Plus2
(Smart Gateway)

Pro-3200 APP

Pro-3600
Portable Vibration Diagnosis Instrument

IEPE
Vibration Sensor

Temp. Sensor
magnetic
TM-100
& TT-300

RS-485

XDAQ
(Smart Gateway)

Pro-3600 APP

The Pro-3200 is the Ultimate Vibration Measurement Instrument

Key Features

- Work with smart phone anywhere to replace the conventional expensive frequency analyzer.

- Remote diagnosis function: Provide multi-person simultaneous remote login, consultation equipment.

- RMS (time-domain) and FFT (frequency-domain) selectable from your smart phones.

- Integrate the conventional operations: measure, analysis and diagnosis, three-in-one. A breaking
  change in the field of vibration measurement.

- Designed with suck-on magnet type sensors, battery-pack powered IoT gateway with built-in WiFi,
  connecting wirelessly to smart phones, no IP setting, no power wiring, just plug-and-play.

- All vibration measurements are done automatically. Within 10 minutes, the hard conventional measures
  will be complete.

- The measured data are automatically filed into vibration management Data-Base.

- Vastly enhance the operations and reduce huge maintenance cost.

The most important applications in Pro-3200 features :

1. Mobile phone export measurement report :
   Important tools for professional maintenance personnel

2. Establish a database of vibration data :
   Important achievements of the factory maintenance unit

Just plug the gauges and the mobile power pack to the Gateway and play.

Measurable, diagnostic items are:

Vibration   Temperature

Installation

RS485 (Industry Standard)

(Built-in Wi-Fi)

Smart Phone (with App)

USB

Motor

Mobile power pack
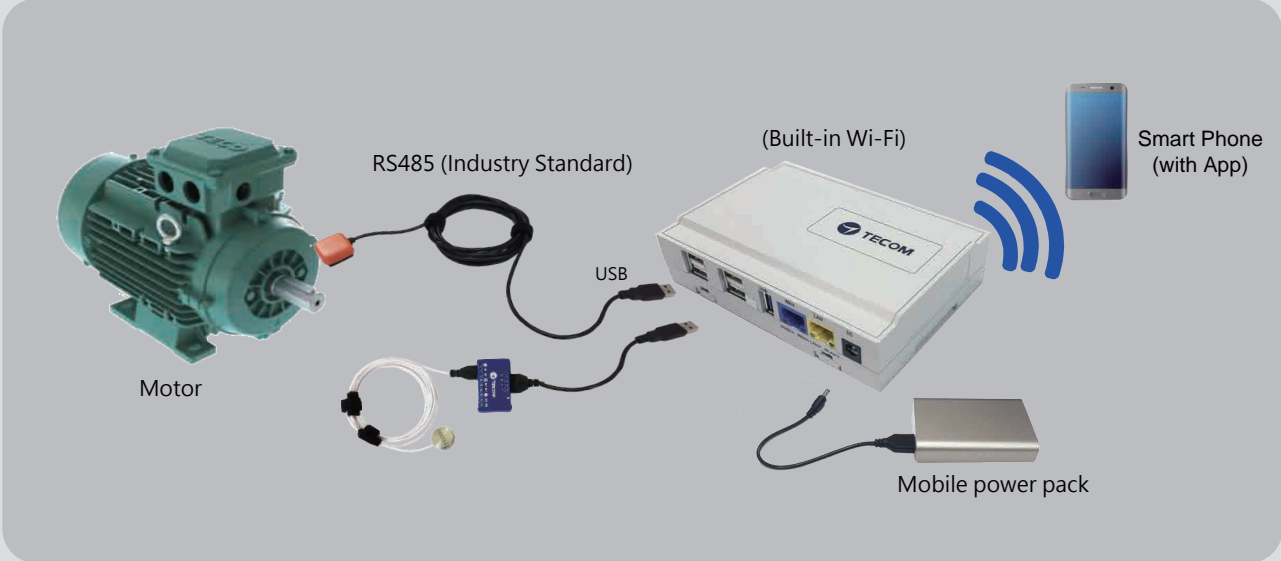
Pro-3200 series product list

Model	AG300 Plus 2	VB-200STU	Power Bank	Power Adapter	TT-300	TM-100
Pro-3200	1	2	1	1	X	X
Pro-3200B	1	2	1	1	1	1

Pro-3200

Portable Vibration Diagnosis Instrument

ANDROID APP ON
Google play

Download on the
App Store

FC CE SRRC IC

Contents :
- AG-300 Plus x 1   - VB-200STU (Vibration sensor) x 2   - Power Pack x1
- Power Adapter x 1   - Portable Toolbox x 1
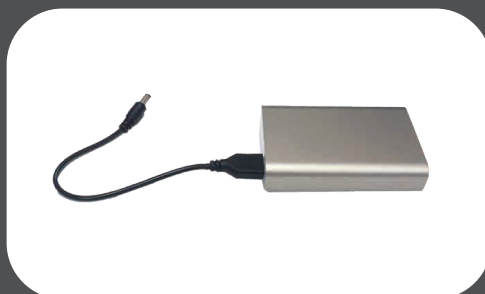
Portable Vibration Diagnosis Instrument

" Pro-3200B
Portable Vibration Diagnosis Instrument "

Contents :
- AG-300 Plus x 1   - VB-200STU (Vibration sensor) x 2   - Power Pack x1
- TM-100 (Temp. Sensor) x 1 - TT-30 0(Temp. Tranducer) x 1 - Power Adapter x 1
- Portable Toolbox x 1

Pro-3200 Routine Check Database Management Software (Report within Pdf format）
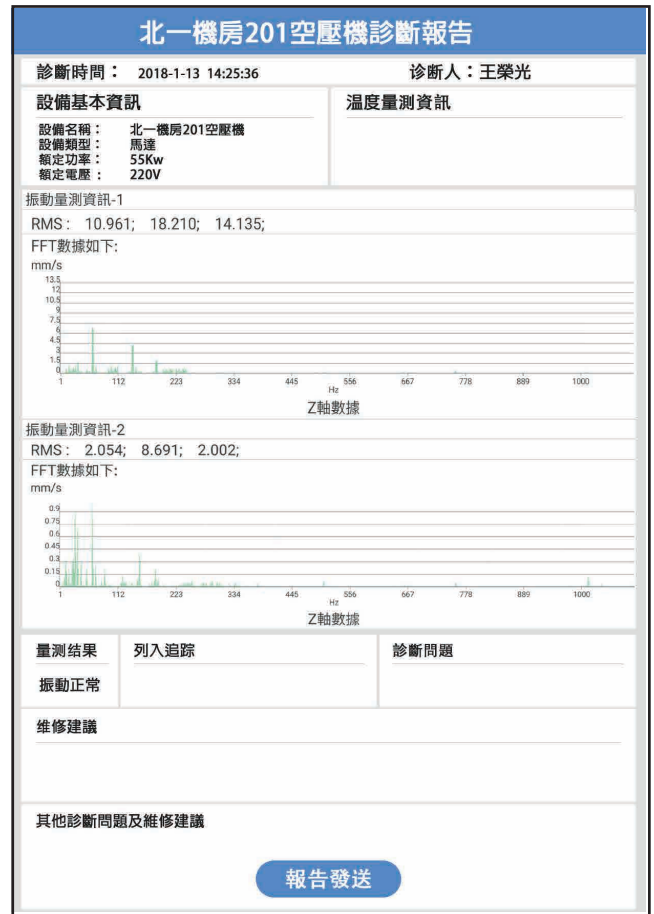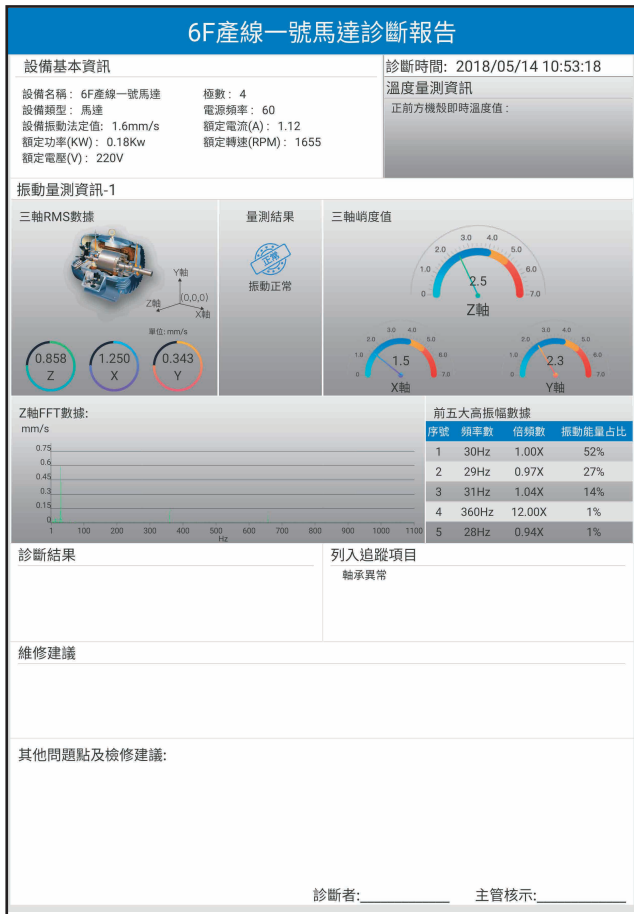
Routine measures on factory machines, and automatically establish Vibration Data-Base of all machines in the factory.

Key Features

- The Data-Base keeps track of all machines' vibration status, to protect their health.

- Also, the Data-Base is updated routinely, after a while the Big-Data algorithm will be able to predict when and how a machine is going to fail.

- The all factory Data-Base represents a new-generation "4.0 Maintenance Automation" of the factory; a Major Accomplishment of the plant manager, at a very modest investment.

Ordering Information

Model Name	Part Number	Description
Pro-3200	261-450592R	English version(American standard PA), Portable Vibration Diagnosis Instrument (vibration)
Pro-3200	261-450591R	English version (Australian PA), Portable Vibration Diagnosis Instrument (vibration)
Pro-3200B	261-450604R	English version(American standard PA), Portable Vibration Diagnosis Instrument (vibration + Temperature)
Pro-3200B upgrade kit	261-450141R	English version, the upgrade kit for portable vibration diagnosis instrument (Pro-3200 to Pro-3200B)
PSU adapter	671-000104R	Australian PSU adapter
Magnetic pole	703-099900R	VB-200STU accessories, Magnet Holder and pole

Pro-3200-DB
Routine Check Database
Management Software

Routine Check Database Management Software

Pro-3200-DB

Routine Check Database Management Software ❞

"Smart Portable Vibration Diagnosis Instrument" is a new generation of electromechanical equipment vibration measuring device. With this system, the Pro-3200 measurement data can be imported into the JSON format through the mobile APP or PC, providing information viewing, management and comparison of the electromechanical equipment, building a library for the factory equipment measurement and diagnostic data, and realizing the whole plant on the information management of the health status of electromechanical equipment is an effective tool for the traditional factory upgrade to industry 4.0.

Major Four Functions

- Record the whole plant equipment status and information statistics.
- Instant import the Pro3200 measurement data diagnosis report by using remote mobil phone APP.
- Measurement and diagnostic data of electromechanical equipment, RMS, kurtosis, FFT spectrum comparison, historical trend graph display
- Support equipment, report, system log and management functions

The electromechanical health data inspection and construction database will be completed in 10 minutes, and the data obtained can be transmitted through Wechat, Line and email.

On-site Measurement → **Diagnostic Analysis** → **Data Upload** → **Build Database**

Broadband router

Internet

RS-485

Motor

USB

Smart Phone (with App)

Power Bank

Routine Check Database

Routine Check Database Management Software

Six Major Features

1. Multi-language interface, suitable for users in different regions

2. Data support Json format

3. Report import mode supports PC local import and mobile APP remote import

4. Support single measurement, double stroke comparison and historical trend display of equipment measurement data.

5. Support data import and management of motors, compressors, pumps and other types of electromechanical equipment

6. Support system log query management.

Login to the home page and data import

Visually display the entire factory inspection database, including the number of equipments, the number of reports, and the number of reports of normal and abnormal vibrations.
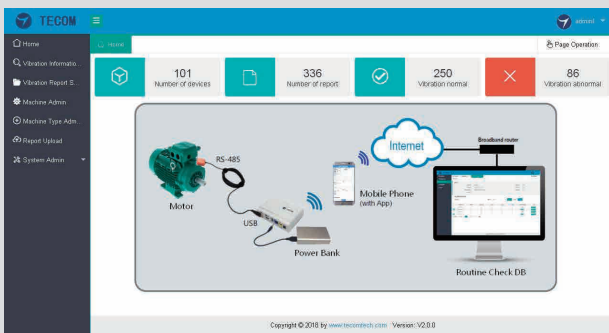
Report comparison

Different time data changes of the same measuring point of the equipment; RMS, kurtosis comparison; FFT comparison.
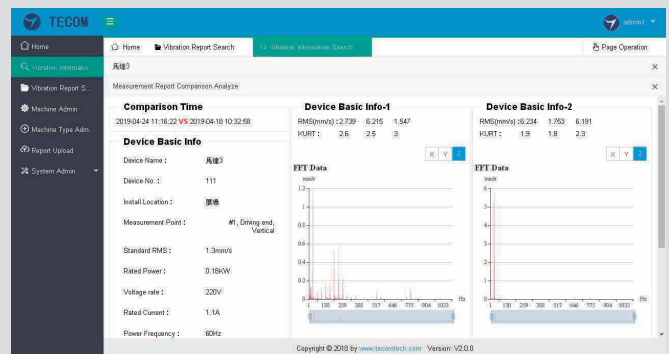
Report presentation

- Basic equipment information and measurement time
- Vibration RMS, kurtosis, FFT and top-five energy
- Diagnostic results and maintenance recommendations
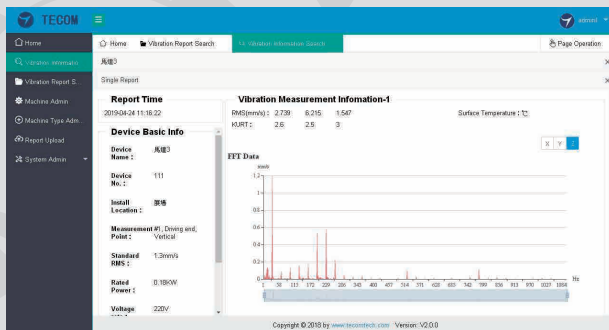
Historical trend display

The historical data trend of each parameter in the time interval of the same measuring point of the equipment, so that you can predict the time of equipment maintenance and quickly reach Industry 4.0

Ordering Information

Model	Part Number	Description
Pro-3200-DB	671-502540R	Routine Check Database Management Software

Vibration Gauges

Vibration Gauges

VB-300SC

Industrial grade, screw lock-type, stainless steel, triaxial vibration gauge (with fixed cable)
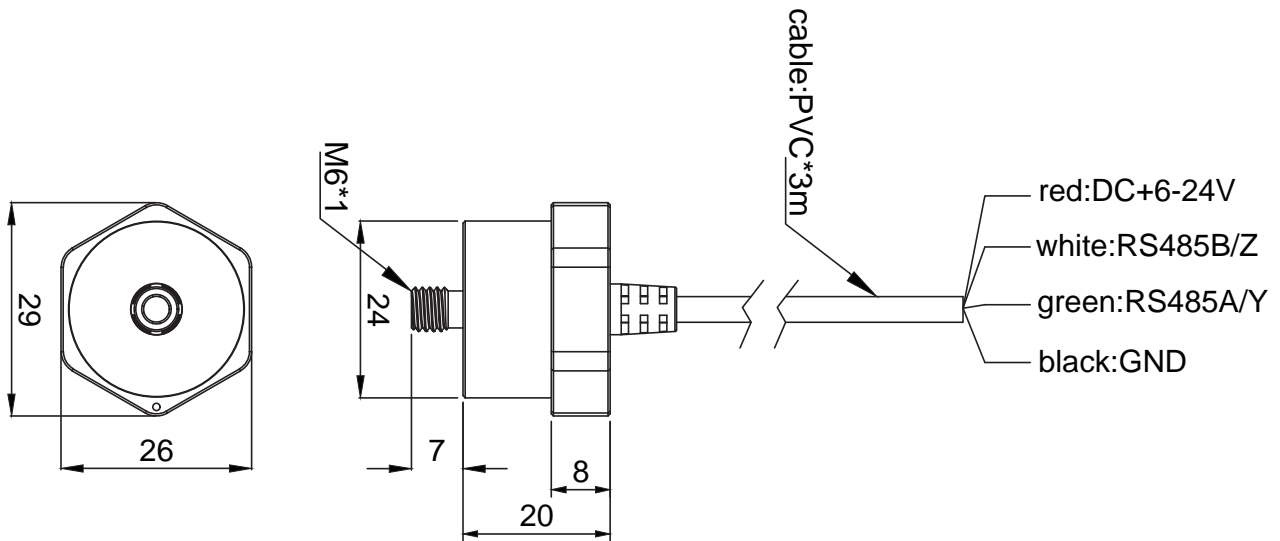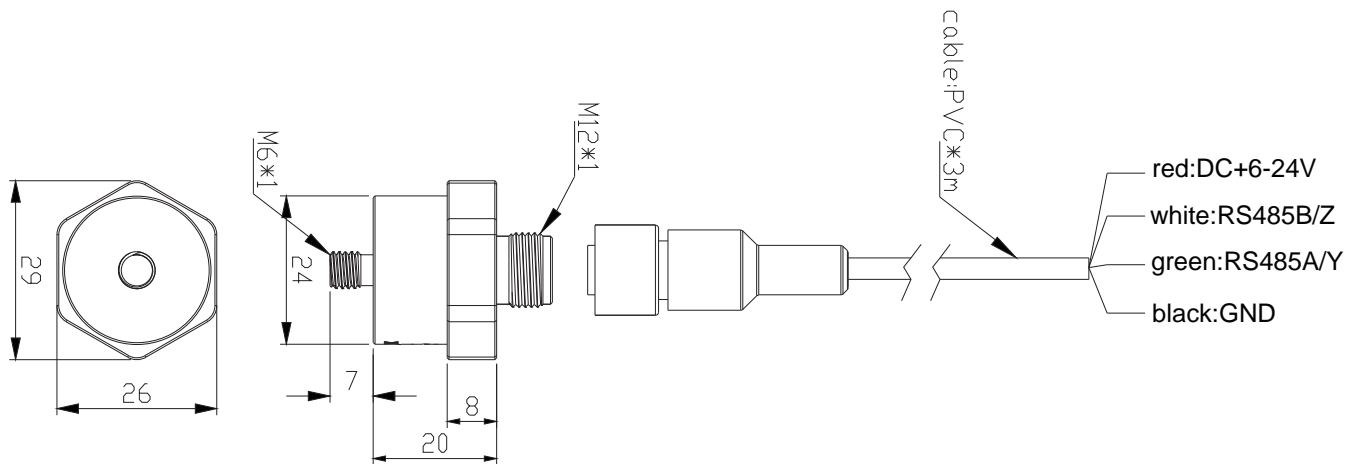

Features

1. Integrated design, with sensor and transducer in one mini package. The output signals are already industrial RS-485. The signal contents include :

    a. 3-axis Speed, acceleration RMS

    b. 3-axis Speed, acceleration FFT

    c. 3-axis Displacement , peak – peak

2. Open Signal Protocols, can be directly connected to 3rd Party PLC and DCS, without the need of DAQ.

3. The stainless steel used is 316L grade, (the hardest metal grade) with high installation torque of 12N-m, better than industry standard 6-8 N-m.

Dimension

29mm × 26mm × 27mm

M6*1

cable:PVC*3m

red:DC+6-24V

white:RS485B/Z

green:RS485A/Y

black:GND

29

26

24

7

8

20

Specification

Velocity Ranges	0-300 mm/sec
Frequency Response	10Hz to 1kHz ± 5% 1Hz to 1.8 KHz ± 3dB (adjustable filter, 10Hz-1000Hz filter for ISO2954)
Range	±8g
Transverse Sensitivity	2%(typical)
Case Material	316L Stainless Steel
Sensing Element	MEMS
Mounting Torque	12Nm
Weight	117g(w/cable)
Interface	RS485
Supply Voltage	6-24 V DC
Operating Temperature Range	-40 ~85 °C
Maximum Shock	10000g
Sealing	IP67
Cable Material	PVC
Fixed Method	Screw lock type(M6)
Cable Installation Type	Fixed

Vibration Gauges

VB-300SCB

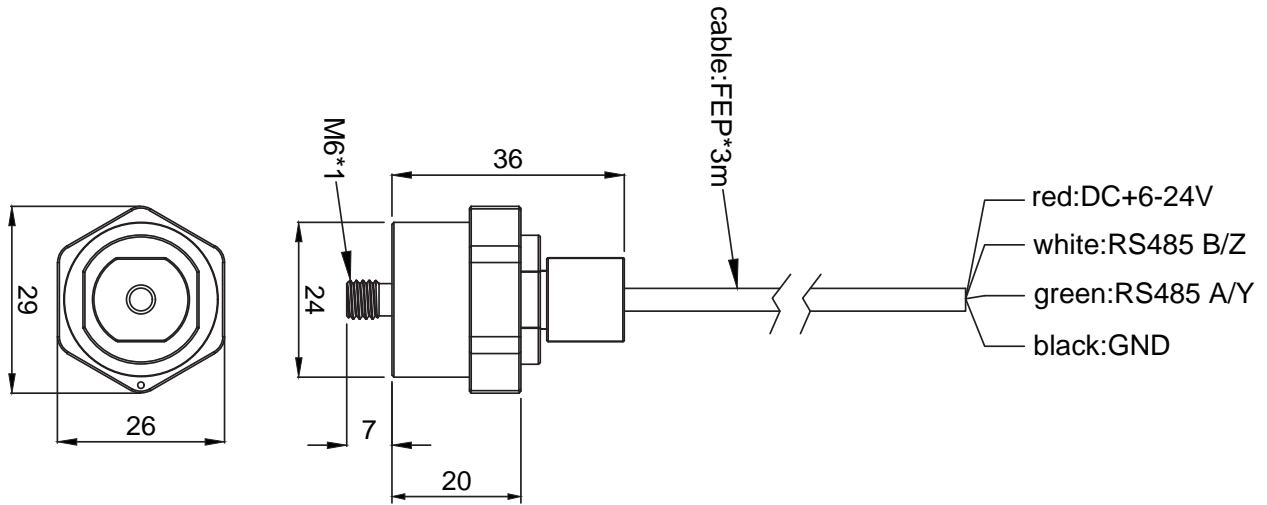**Industrial grade, screw lock-type, stainless steel, triaxial vibration gauge (separation cable)**

Features

1. Integrated design, with sensor and transducer in one mini package. The output signals are already industrial RS-485. The signal contents include :

   a. 3-axis Speed, acceleration RMS

   b. 3-axis Speed, acceleration FFT

   c. 3-axis Displacement , peak – peak

2. Open Signal Protocols, can be directly connected to 3rd Party PLC and DCS, without the need of DAQ.

3. The stainless steel used is 316L grade, (the hardest metal grade) with high installation torque of 12N-m, better than industry standard 6-8 N-m.

4. The plug-in cable can be transported separately from the gauge mounted on the motor, which is extremely convenient. Cables are available in PVC, PU or shielded.

Dimension

29mm x 26mm x 40mm

M6*1

M12*1

cable:PVC*3m

red:DC+6-24V

white:RS485B/Z

green:RS485A/Y

black:GND
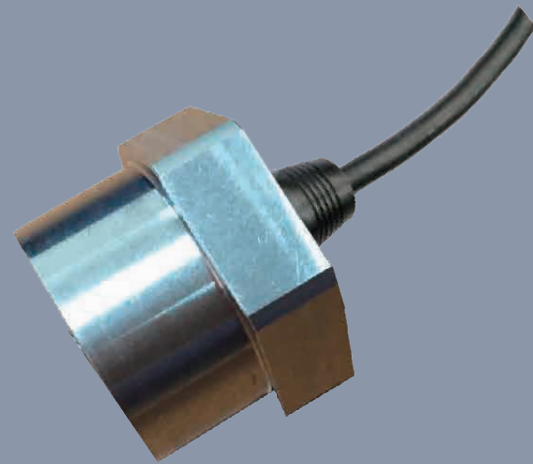
29

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Specification

Velocity Ranges	0-300 mm/sec
Frequency Response	10Hz to 1kHz ± 5% 1Hz to 1.8 KHz ± 3dB (adjustable filter, 10Hz-1000Hz filter for ISO2954)
Range	±8g
Transverse Sensitivity	2%(typical)
Case Material	316L Stainless Steel
Sensing Element	MEMS
Mounting Torque	12Nm
Weight	Body 50g, PVC cable 200g
Interface	RS485
Supply Voltage	6-24 V DC
Operating Temperature Range	-40 ~85 °C
Maximum Shock	10000g
Sealing	IP67
Cable Material	PVC (Standard) · PU or Shielded (Option)
Fixed Method	Screw lock type(M6)
Cable Installation Type	Plug-in , M12 Connector

Vibration Gauges

VB-300SCT

Industrial grade, screw lock-type, stainless steel, triaxial vibration gauge (with Teflon cable)
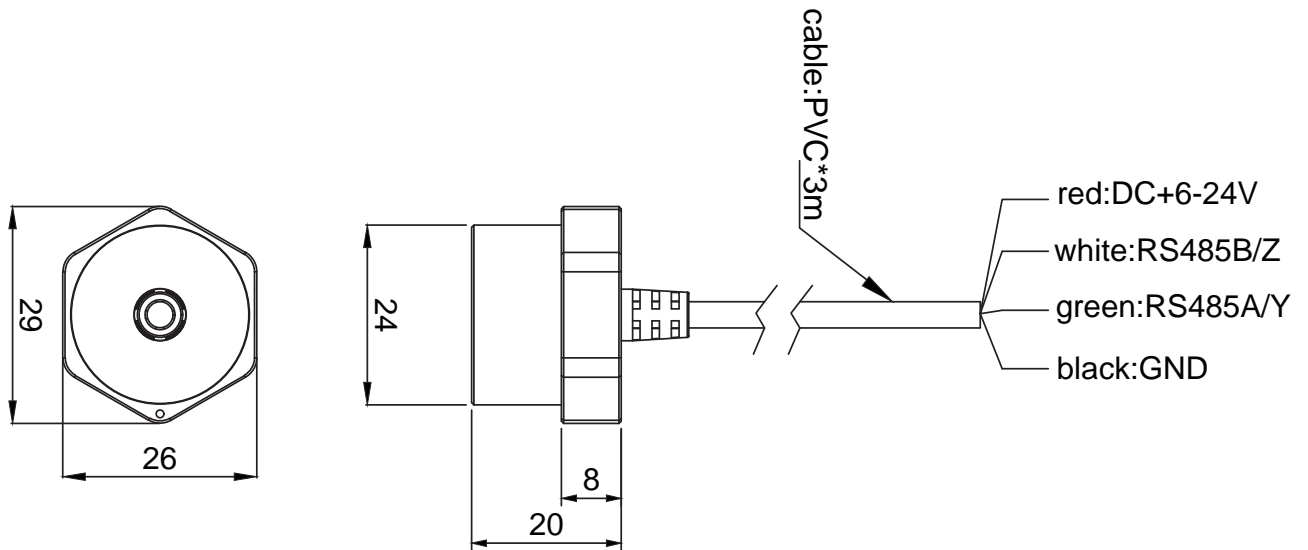
Features

1. Integrated design, with sensor and transducer in one mini package. The output signals are already industrial RS-485. The signal contents include :

    a. 3-axis Speed, acceleration RMS

    b. 3-axis Speed, acceleration FFT

    c. 3-axis Displacement , peak – peak

2. Open Signal Protocols, can be directly connected to 3rd Party PLC and DCS, without the need of DAQ.

3. The stainless steel used is 316L grade, (the hardest metal grade) with high installation torque of 12N-m, better than industry standard 6-8 N-m.

4. The Teflon cable is used to meet the installation environment where acid and alkali corrosion resistance is required.

Dimension

29mm × 26mm × 43mm

M6*1

cable:FEP*3m

36

29

24

26

7

20

red:DC+6-24V
white:RS485 B/Z
green:RS485 A/Y
black:GND

Specification

Velocity Ranges	0-300 mm/sec
Frequency Response	10Hz to 1kHz ± 5% 1Hz to 1.8 KHz ± 3dB (adjustable filter, 10Hz-1000Hz filter for ISO2954)
Range	±8g
Transverse Sensitivity	2%(typical)
Case Material	316L Stainless Steel
Sensing Element	MEMS
Mounting Torque	12Nm
Weight	112g(w/cable)
Interface	RS485
Supply Voltage	6-24 V DC
Operating Temperature Range	-40 ~85 °C
Maximum Shock	10000g
Sealing	IP67
Cable Material	Teflon cable
Fixed Method	Screw lock type (M6)
Cable Installation Type	Fixed

Vibration Gauges

VB-300ST

Industrial grade, stick-type, stainless steel, triaxial vibration gauge (with cable)

Features

1. Integrated design, with sensor and transducer in one mini package. The output signals are already industrial RS-485. The signal contents include :

    a. 3-axis Speed, acceleration RMS

    b. 3-axis Speed, acceleration FFT

    c. 3-axis Displacement, peak – peak

2. Open Signal Protocols, can be directly connected to 3rd Party PLC and DCS, without the need of DAQ.

3. The stainless steel used is 316L grade, (the hardest metal grade) with high installation torque of 12N-m, better than industry standard 6-8 N-m.

Dimension

29mm × 26mm × 20mm

cable:PVC*3m

29
26
24
8
20

red:DC+6-24V
white:RS485B/Z
green:RS485A/Y
black:GND

Specification

Velocity Ranges	0-300 mm/sec
Frequency Response	10Hz to 1kHz ± 5% 1Hz to 1.8 KHz ± 3dB (adjustable filter, 10Hz-1000Hz filter for ISO2954)
Range	±8g
Transverse Sensitivity	2%(typical)
Case Material	316L Stainless Steel
Sensing Element	MEMS
Weight	120g(w/cable)
Interface	RS485
Supply Voltage	6-24 V DC
Operating Temperature Range	-40 ~85 °C
Maximum Shock	10000g
Sealing	IP67
Cable Material	PVC
Dimension	29mm x 26mm x 20mm
Fixed Method	黏貼式
Cable Installation Type	Fixed

Vibration Gauges

VB-420SCB

Industrial grade, screw lock-type, stainless steel, single-axis vibration gauge (separation cable)

Features

1. MEMS sensor, one axis output.

2. Sensor and transducer are integrated in one mini package.

3. Output signal : 4~20mA.

4. Output signal contents : Speed（RMS.

5. Can be connected to 3rd party PLC.

6. Also available: AD-300 analog-to-digital converter that converts 4-20mA / 0-10V analog

   signals into digital RS-485 signals (optional).

6. The stainless steel used is 316L grade, (the hardest metal grade) with high installation torque

   of 12N-m, better than industry standard 6-8 N-m.

Dimension

29mm x 26mm x 40mm
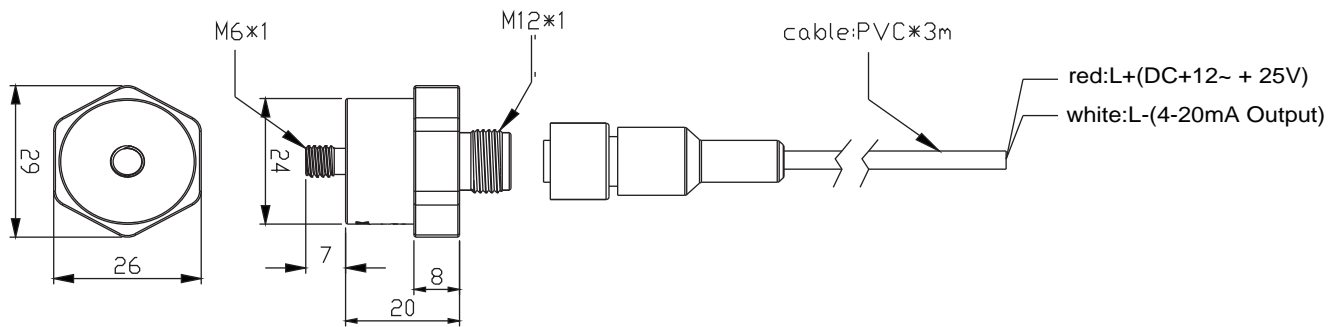
Specification

Operating Voltage	15~25V
Measuring Rang	0~25 mm/s (RMS)
Frequency Range	10Hz to 1000Hz for ISO2954
Output Signal	4-20mA
Accuracy	< ± 6%
Non-Linearity	0.6% of FS
Case Material	316L Stainless Steel
Sensing Element	MEMS
Mounting Torque	12Nm
Weight	50g
Operating Temperature Range	-40 ~85 °C
Maximum Shock	10000g
Sealing	IP67
Cable Material	PVC
Cable Installation Type	Plug-in , M12 connector

Vibration Gauges

VB-300SCBEx

Industrial explosion-proof grade, screw lock-type, stainless steel, triaxial vibration gauge (separation cable)
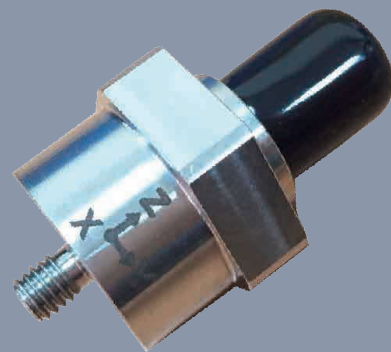
Features

1. Integrated design, with sensor and transducer in one mini package. The output signals are already industrial RS-485. The signal contents include :
   - a. 3-axis Speed, acceleration RMS
   - b. 3-axis Speed, acceleration FFT
   - c. 3-axis Displacement , peak – peak

2. Open Signal Protocols, can be directly connected to 3rd Party PLC and DCS, without the need of DAQ.

3. Compliant with UL certification UL 121201 and CSA C22.2 NO. 213, Class I Div.2 Group A-D.

4. The stainless steel used is 316L grade, (the hardest metal grade) with high installation torque of 12N-m, better than industry standard 6-8 N-m.

5. The plug-in cable can be transported separately from the gauge mounted on the motor, which is extremely convenient. Cables are available in PVC, PU or shielded.

Dimension

29mm × 26mm × 40mm

M6＊1
M12＊1
cable:PVC＊3m

29
26
24
7
8
20

red:DC+6-24V
white:RS485B/Z
green:RS485A/Y
black:GND

Specification

Velocity Ranges	0-300 mm/sec
Frequency Response	10Hz to 1kHz ± 5% 1Hz to 1.8 KHz ± 3dB (adjustable filter, 10Hz-1000Hz filter for ISO2954)
Range	±8g
Transverse Sensitivity	2%(typical)
Case Material	316L Stainless Steel
Sensing Element	MEMS
Mounting Torque	12Nm
Weight	Body 50g, PVC cable 200g
Interface	RS485
Supply Voltage	6-24 V DC
Operating Temperature Range	-40 ~85 °C
Maximum Shock	10000g
Explosion-proof grade	UL 121201 and CSA C22.2 NO. 213, Class I Div.2 Group A-D
Sealing	IP67
Cable Material	Shielded (Option)
Fixed Method	Screw lock type(M6)
Cable Installation Type	Plug-in , M12 Connector

VB-300 Product Accessories

" Screw-lock Pole "

Dimension

Ø10mm x 80mm
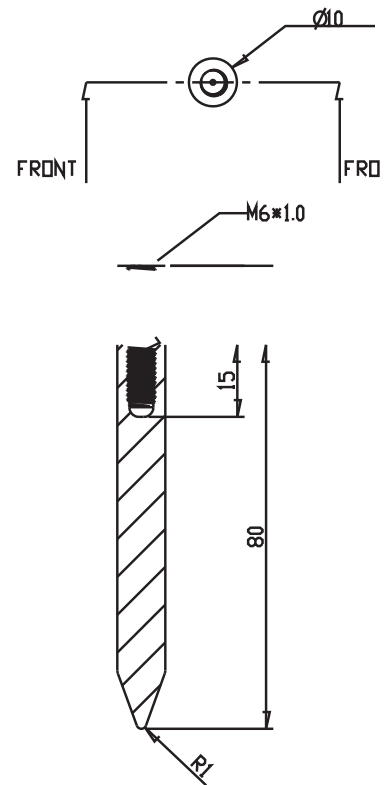
" Magnetic adapter "
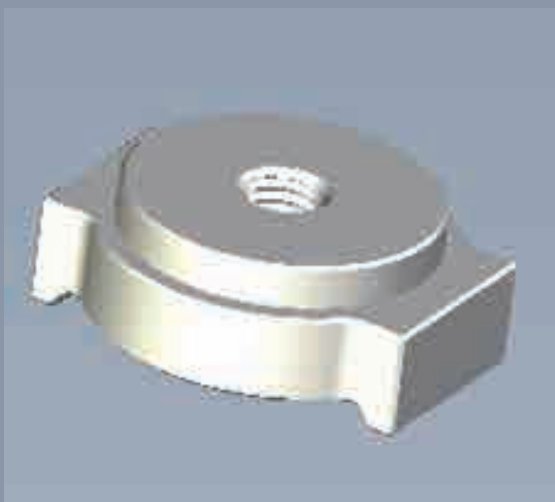
Dimension

31mm x 11.5mm x Ø27.5mm
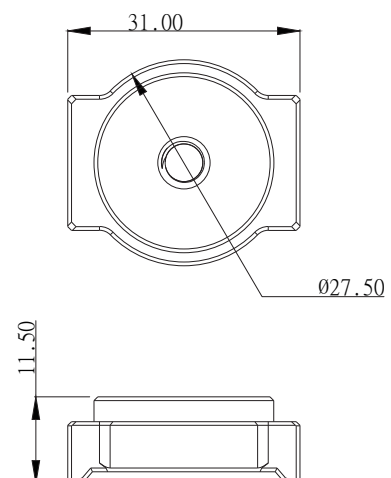
Vibration Gauges

" **VB-200ST**

Industrial grade, stick-type, triaxial vibration gauge (with cable) "

Features

1. Integrated design, with sensor and transducer in one mini package. The output signals are already industrial RS-485. The signal contents include :

     a. 3-axis Speed, acceleration RMS

     b. 3-axis Speed, acceleration FFT

2. Open Signal Protocols, can be directly connected to 3rd Party PLC and DCS, without the need of DAQ.

3. Small size, easy to install, suitable for various installations

Dimension

30.5mm × 30.5mm × 11.5mm
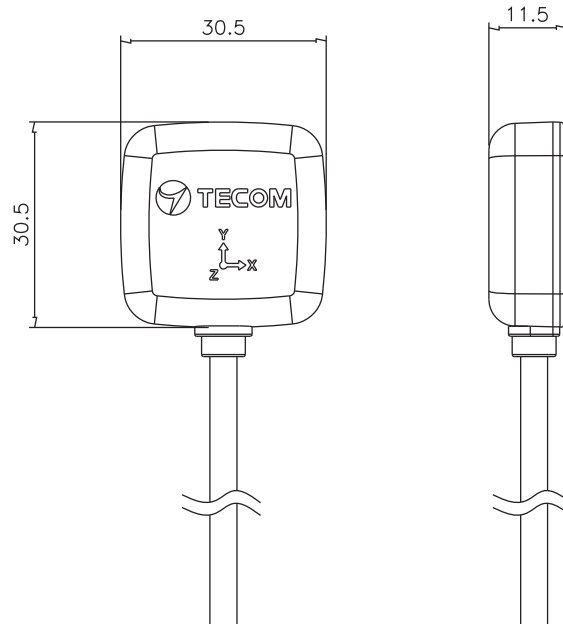
Specification

Velocity Ranges	0->1130 Hz
Frequency Response	300 mm/sec
Range	±16g
Transverse Sensitivity	2%(typical)
Case Material	Plastic
Sensing Element	MEMS
Weight	50g, 83g(w/cable)
Interface	RS485
Supply Voltage	6-24 V DC
Operating Temperature Range	-40 ~85 °C
Maximum Shock	10000g
Sealing	IP66
Dimension	30.5mm x 30.5mm x 11.5mm
Fixed Method	Stick type
Cable Installation Type	Fixed

VB-200 Product Accessories

" Magnetic Pole "

Dimension

30.5mm x 30.5mm x 86.5mm

Ordering Information

| Model	Part Number	Description
VB-200ST	261-450548R	Stick-type vibration gauge, triaxial, fixed cable (PVC, 3000mm), RS-485 Signal output
Magnetic Pole	703-099900R	Suitable for VB-200STU(Pro-3200)
VB-300SC	261-450135R	Screw lock type vibration gauge, triaxial, fixed cable (PVC, 3000mm), 316L stainless steel, RS-485 signal output
VB-300SCB	261-450139R	Screw lock type vibration gauge, triaxial, plug-in cable (M12 Connector), 316L stainless steel, RS-485 signal output
VB-300SCT	261-450140R	Screw lock type vibration gauge, triaxial, fixed cable (TFLONG, 3000mm), 316L stainless steel, RS-485 signal output
VB-300ST		Stick-type vibration gauge, triaxial, fixed cable (PVC, 3000mmm), 316L stainless steel, RS-485 signal output
VB-300SCM		(Note 1), Non-standard product
VB-420SCB	261-450144R	Screw lock type vibration gauge, single axis, plug-in cable (M12 Connector), 316L stainless steel, 4~20mA signal output
VB-300SCBEx		Explosion-proof grade (UL/CSA Class 1, Div 2), screw lock-type, triaxial, plug-in cable (M12 Connector), 316L stainless steel, RS-485 signal output
VB-500SC	261-450152R	Explosion-proof grade (Zone 1), screw lock-type, triaxial, fixed cable (TFLONG, 3000mm), 316L stainless steel, RS-485 signal output , Certificate : Ex mb IIC T5 Gb (China)
Cable	575-000414R	180˚ Separate cable (M12 connector), PVC
Magnetic Adapter	790-000087R	Magnetic adapter for VB-300 series vibration gauge
Screw-lock Pole	703-101300R	(Note 2) Suitable for VB-300SC
Notes: 1. VB-300SCM magnetic vibration gauge ordering method: Please choose any lock type vibration gauge and purchase magnetic adapter, which is a magnetic vibration gauge. 2. Any screw lock-type vibrating gauge and additional screw-lock pole, which are self-assembled, are pole-type vibration gauges.		

Application Reference

1. VB-300 Connect to PLC

VB-300SCB

RS-485

PLC
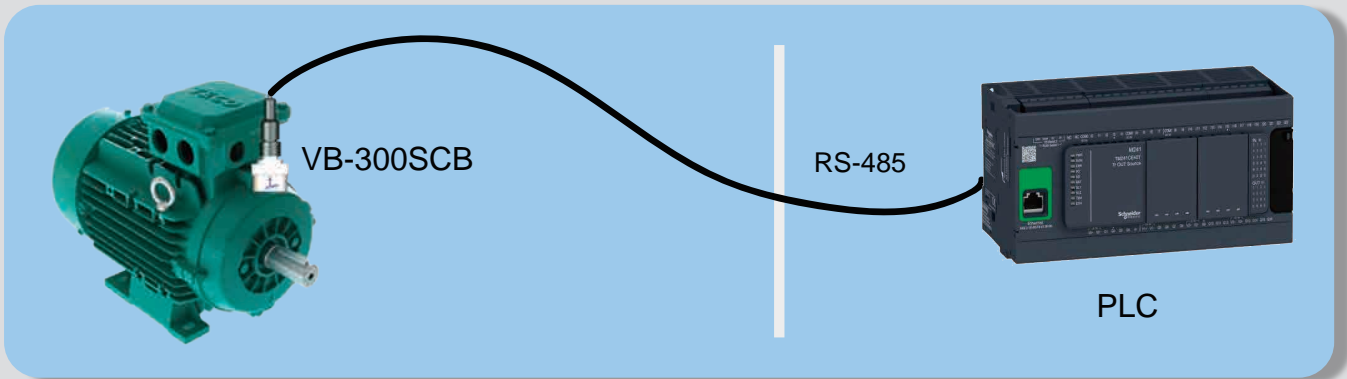
2. VB-300 Connect to DCS

VB-300SCB

RS-485

DCS

3. VB-420SCB Connect to PLC

VB-420SCB

4-20mA

PLC
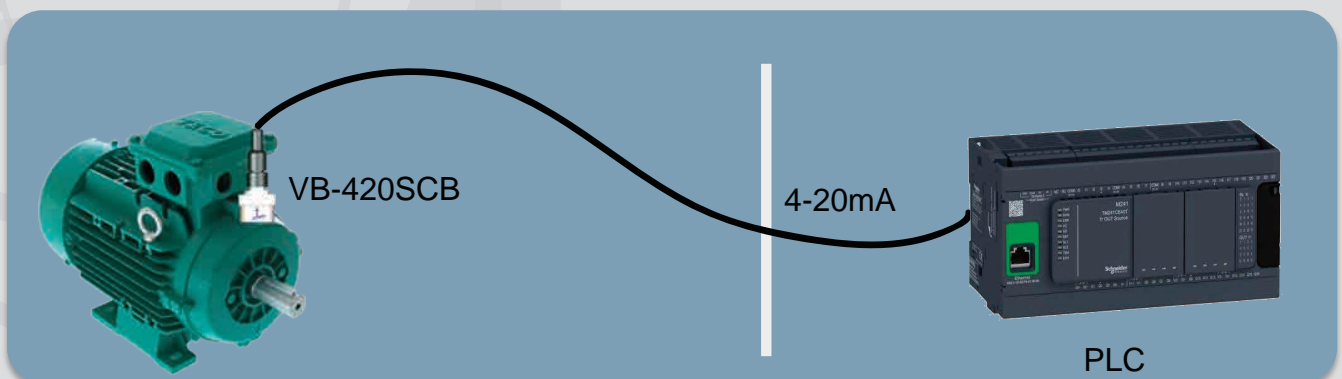
VB-300 Series Wireless-Gauge

Descriptions :

1. Wired Gauge VB-300 integrated with wireless Gateway AG-300 (Wi-Fi + NBIoT)

2. Built-in Wi-Fi, Plug-in NBIoT Dongle

3. Wireless Transmission and Networking

4. With IoT Communications to Smart Mobile Devices

5. With built-in Diagnosis Solution: working with Smart Phone APP interactively and □

   in Real-time

6. Wi-Fi

   Format : 802.11n , 2.4GHz, 2T2R MIMO

   Content : Velocity (RMS, FFT), Acceleration (RMS, FFT), Displacement (p-p)

7. NBIoT

   Format : LTE & 5G

   Content : Velocity (RMS, FFT), Acceleration (RMS, FFT), Displacement (p-p)

Installation

Vibration — RS-485 Signal — IIoT Gateway — Power

WiFi Mobil Nerwork

Smart Phone (Android ios App)
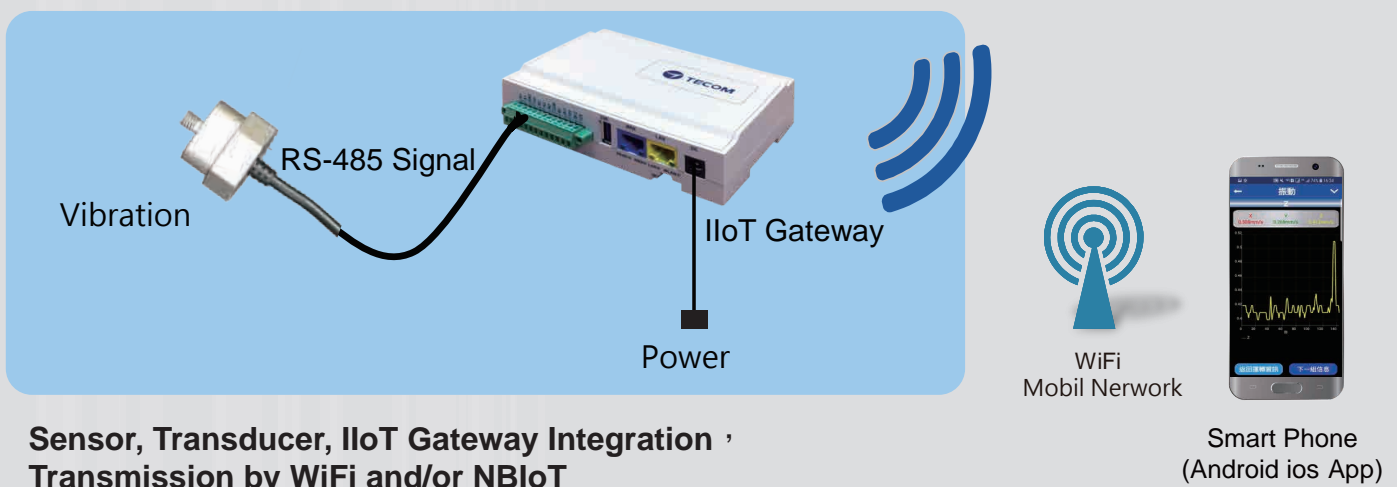
Sensor, Transducer, IIoT Gateway Integration，Transmission by WiFi and/or NBIoT

Temperature Sensors

Temperature Sensors

TS-200
Stick-type Temperature Sensor
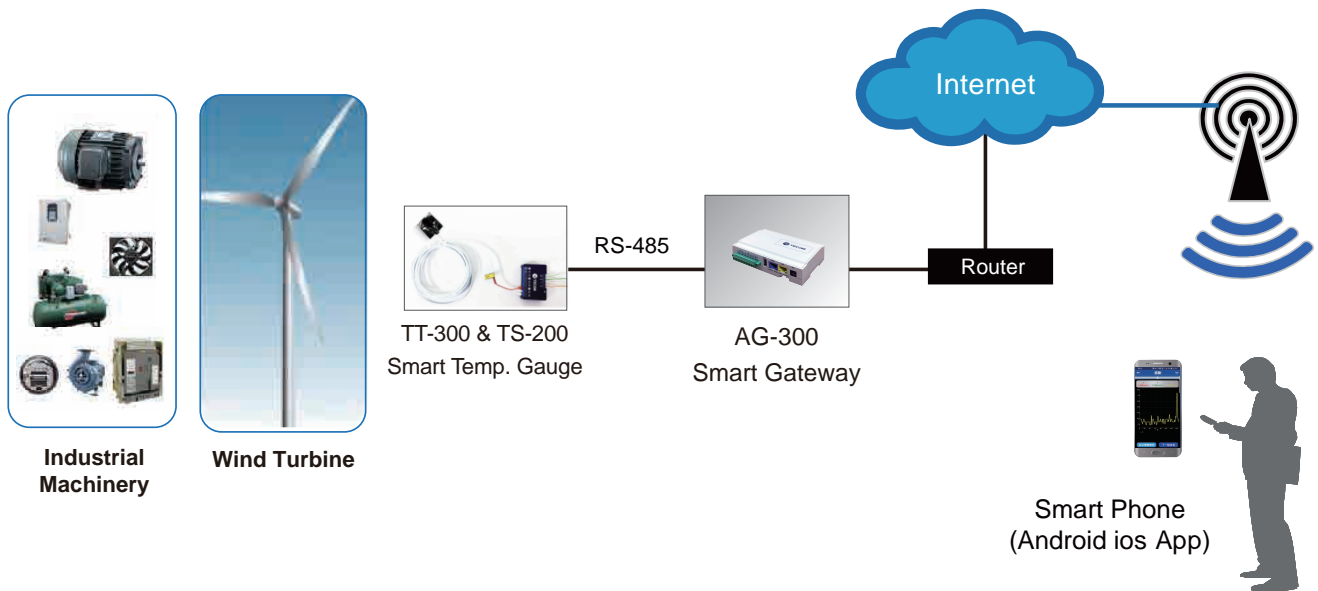
Dimension

50mm × 35mm

TS-200 stick-type temperature sensor has high cost performance and simple product installation. After installing this temperature sensor on the machine, it is connected to the temperature sensing converter TT-300 and connected by RS-485 communication. Line AG-300 (Smart IoT-Gateway), which can be directly connected to smart phones after being connected to the Internet, provides strongly always connect, push notification, interactive and other mobile maintenance (Mobile Maintenance, MM) functions.

Application Diagram

Industrial Machinery

Wind Turbine

TT-300 & TS-200
Smart Temp. Gauge

RS-485

AG-300
Smart Gateway

Internet

Router

Smart Phone
(Android ios App)

Specification

Sensor	PT100Ω Thermistor B class
Range	-15℃~105 ℃
Accuracy	DIN IEC 751 Class B.± 1℃
Response time	200℃/2S
Resistance	Gasoline, Acetone, Detergent, Medium Acid/Alkaline
Installation method	Stick-on Backing Tape
Outlet wire material	TEFLON/2000mm
Adhesion specifications (clean metal surface)	ASTM D-3654(3M)
Adhesive test after 5 minutes	1000g@50℃, 800g@93℃, 500g@149℃ (Square inches per inch)

Temperature Sensors

TS-300
High precision stick-type temperature sensor

TS-300 high-precision stick-type temperature sensor with high accuracy, high measurement temperature range and easy installation. After installing this temperature sensor on the machine, it is connected to the temperature sensing converter TT-300 and connected by RS-485 communication. Line AG-300 (Smart IoT-Gateway), which can be directly connected to smart phones after being connected to the Internet, provides strongly always connect, push notification, interactive and other mobile maintenance (Mobile Maintenance, MM) functions.

Dimension

40Ø × 4mm

Specification

Sensor	PT100Ω Thermistor B class
Range	-30℃~150 ℃
Accuracy	DIN IEC 751 Class B.± 1℃
Response time	200℃/2S
Resistance	Gasoline, Acetone, Detergent, Medium Acid/Alkaline
Installation method	Stick-on Backing Tape
Outlet wire material	TEFLON/3000mm
Adhesion specifications (clean metal surface)	ASTM D-3654(3M)
Adhesive test after 5 minutes	1000g@50℃, 800g@93℃, 500g@149℃ (Square inches per inch)

Temperature Sensors

" TM100

High precision magnetic temperature sensor **"**

TM-100 high-precision magnetic temperature sensor with high accuracy, high measurement temperature range and easy installation. After installing this temperature sensor on the machine, it is connected to the temperature sensing converter TT-300 and connected by RS-485 communication. Line AG-300 (Smart IoT-Gateway), which can be directly connected to smart phones after being connected to the Internet, provides strongly always connect, push notification, interactive and other mobile maintenance (Mobile Maintenance, MM) functions.

Dimension

22Ø×10mm

Temperature resistant
permanent strong magnet

Ø 22

10
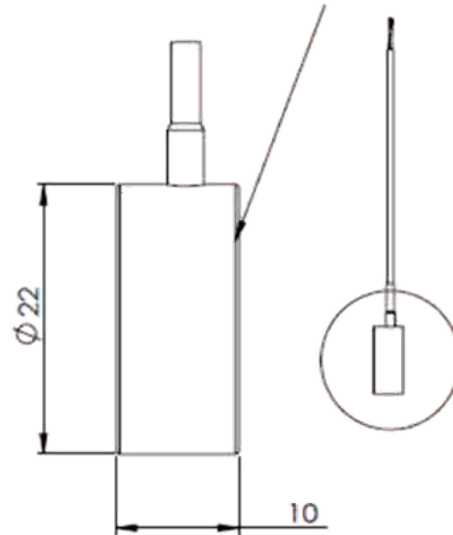
Specification

Sensor	PT100, Ω Thermistor A class
Range	-30℃~150 ℃
Accuracy	Single DIN IEC 751 Class A.
Response time	3sec., (Surface is completely in close contact)
Surface dimension	22Ø 20mmt M3, Stainless Steel
Installation method	Magnetic Type
Outlet wire material	Industrial grade, 28AWG 220α, TEFLON wire
Thermal conductivity	0.05W/mk ASTM C177
Impedance	10^{18} Ω*mm
Friction coefficient	0.15
Sealing	IP68

Ordering Information

Model	Part Number	Description
TS-200	671-502530R	Stick-type Temperature Sensor, PT100, DIN IEC 751 Class B. ± 1℃, TEFLON wire, Black & Square
TS-300	671-000066R	High precision stick-type temperature sensor, PT100, DIN IEC 751 Class B. ± 0.5℃, TEFLON wire, Red & Round
TM-100	671-000094R	High precision magnetic temperature sensor, PT100, DIN IEC 751 Class A, TEFLON wire, Stainless steel & Round

Smart IoT Gateway

Smart IoT Gateway

AG-300Plus
Smart Mobile Maintenance (MMK) IoT Gateway

Features

1. The IoT Gateway's Always-Connect and Push-Notification capabilities make machine monitoring, reporting, alarming, diagnosis, and control be done remotely, interactively and in real-time, between the machines and remote smart phones.

2. After the real-time operation data detected by the smart sensor is collected, it will be sent to the Smart Machine Health Management Platform (MHm) or mobile APP, and provide trend information and alarms.

3. Support Modbus TCP Protocols, can be directly connected to 3rd Party system as PLC, SCADA, DCS, Cloud…

4. Can connect vibration, temperature, power (voltage, current, power, power, energy), pressure, flow and other sensing signals

Dimension

130mm × 90mm × 36mm
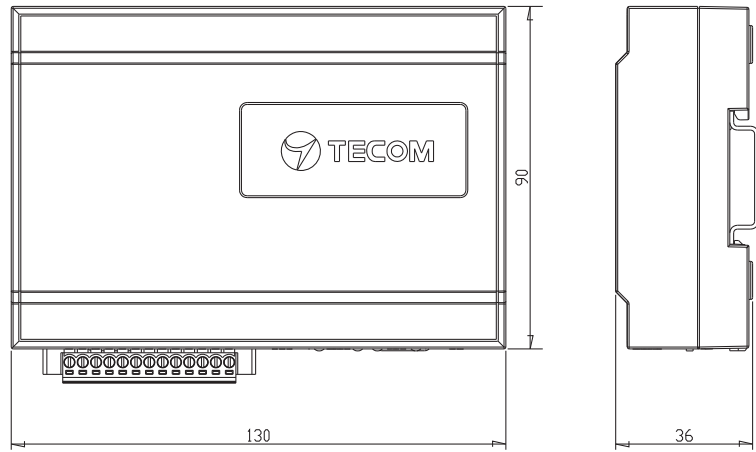
Specification

Interface	Qty	Description
WAN Port	1	10/100Mbps Ethernet
LAN Port	1	10/100Mbps Ethernet
RS-485	2	16 RS-485 IDs selectable per line
USB Port	1	Reserve
DC Jack	1	Power : 12VDC
Reset Button	1	Reset to factory default
Wi-Fi : 802.11n, 2T2R	1	internal antenna
DI	2	Vin > 2.2V, detect ON; Vin < 0.8V, detect OFF.
DO	1	3-wire Contact NC/NO
Operation Temperature		-10 ~ 70 ℃
Din Rail Support		supported
Dimension		130mm × 90mm × 36mm

Ordering Information

Model	Part Number	Description
AG-300Plus	261-450137R	Smart IoT Gateway, English version

3-phase Power Meter

3-phase Power Meter

PM300
3-phase Power Meter

Features

PM-300 Series smart multi-function three-phase network power meter is a suitable low-voltage system for intelligent devices, collecting data and control functions in one device, with the measurement of electrical parameters and energy measurement, to provide communication interface and computer monitoring system Connection, support RS485 interface with MOD-BUS-RTU protocol.

Measurement functions :

1. Line voltage : Vrs, Vst, Vtr

2. Phase-to-phase voltage : Vr, Vs, Vt

3. Three phase current : Ir, Is, It

4. Power : active power, reactive power, apparent power

5. Power Factor

6. Frequency

7. Electricity metering: active energy, reactive energy

Dimension

72mm x 72mm x 86mm

72x72

68x68

72x72

86

Internet

RS-485

Modbus

Router

PM-300
Smart Power Meter

AG-300
Smart Gateway

Smart Phone
(Android ios App)

**Industrial
Machinery**
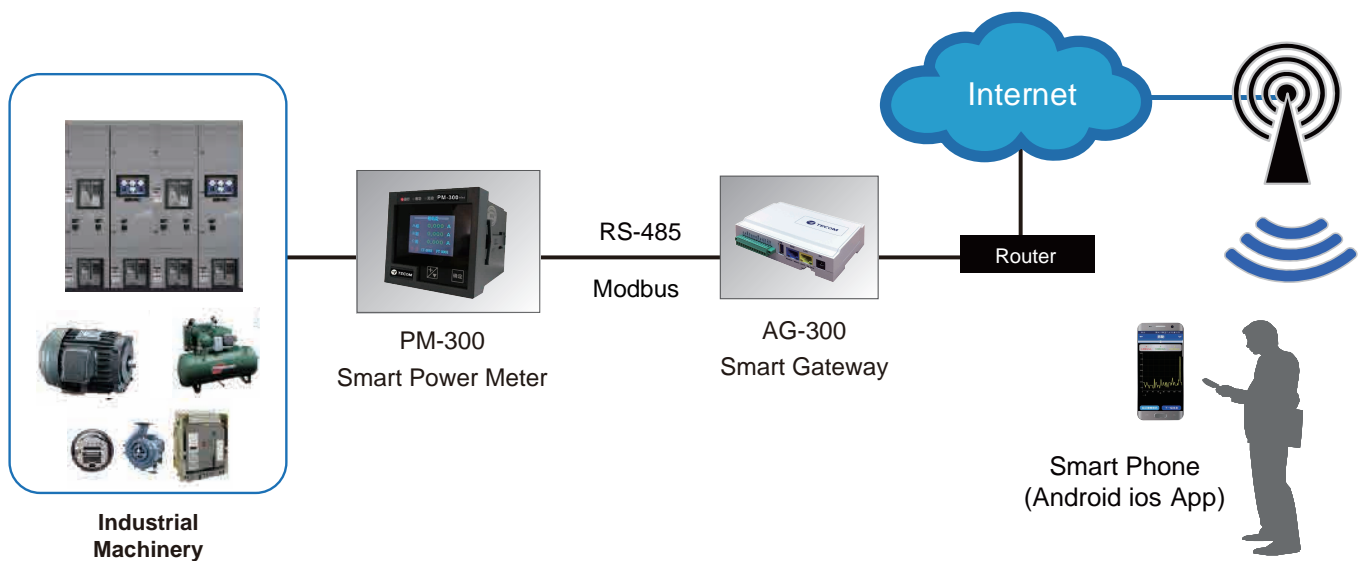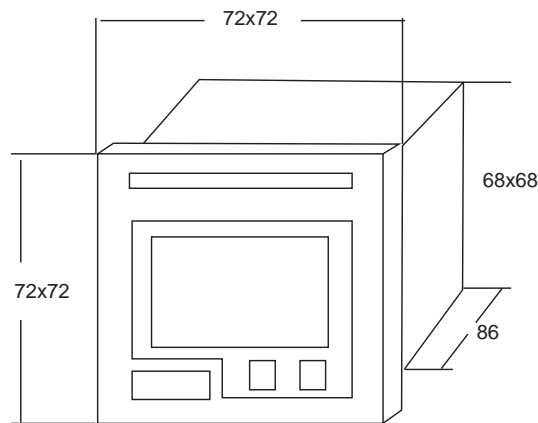
Specification

Measurement parameters	Measurement accuracy	Resolution	Range
Voltage U(Volts)	0.20%	0.10%	0 ~ 999,999V
Current I(Amps)	0.20%	0.10%	0 ~ 30,000A
Active Power P(KW)	0.50%	0.10%	0 ~ 999,999KW
Reactive Power Q(KVAR)	2.00%	0.10%	0 ~ 999,999KVAR
Apparent Power S(KVA)	0.50%	0.10%	0 ~ 999,999KVA
Power Factor (COSΦ)	0.50%	1.00%	-0.6 ~ 1.0
Frequency F(Hz)	0.02Hz	0.1Hz	45 ~ 65Hz
Active Energy (KWH/KVARH)	0.50%	1KWH, KVARH	0 ~ 999,999,999(KWH/KVARH)
Reactiv Energy (KWH/KVARH)	2.00%	1KWH, KVARH	0 ~ 999,999,999(KWH/KVARH)

Operating temperature: -20 ℃ ~ +55 ℃; Storage temperature: -40 ℃ ~ +85 ℃;
Humidity range: 0 ~ 95% No condensation

Electrical specifications :

Relay output
- Output type : Mechanical contact
- Maximum switching voltage : 250VAC, 30VDC
- Maximum switching current : 5A

Equipment withstand voltage, insulation strength
- Power supply, voltage loop > 2KV
- Current loop > 2.5KV

Switch input
- Photocoupler isolation
- Isolated voltage : 2500Vrms
- Passive empty contact input
- Passive empty contact input : 85 ~ 265V AC/DC
- Power consumption : < 4W

Communication : RS-485 interface
- Baud Rate : 2400 ~ 57600bps (optional)
- Modbus-RTU, DL/T645 protocol

Input voltage
- Rated coltage : 100VAC or 400VAC, allow 20% to exceed the limit
- Overload: 2 times the rated value (continuous); 2500VAC/ 1 second (non-recycling)
- Measurement type : True RMS
- Rated frequency : 45 ~ 65Hz
- PT loop power consumption: <0.2VA

Input current
- Rated current : 5A or 1A, 20% limit allowed
- Overload: 2 times rated (continuous); 100A/1 second (non return)
- Measurement Form : True RMS
- Frequency range : 45 ~ 65Hz
- CT loop power consumption : < 0.2VA

Ordering Information

Model	Part Number	Description
PM-300	671-502533R	Three phase digital power meter, English version, V/A/KW/PF, RS-485 signal output

Signal Converter (Transducer)

Signal Converter (Transducer)

TT-300

Smart Temperature Sensing Signal Converter
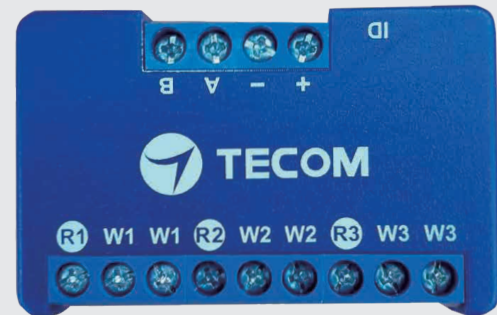
TT-300 "Smart Temperature Sensing Signal Converter" is a new generation of electromechanical device temperature detection device. This device can remotely monitor, notify, alarm, and notify the temperature status of electromechanical equipment through the network (wired or wireless).
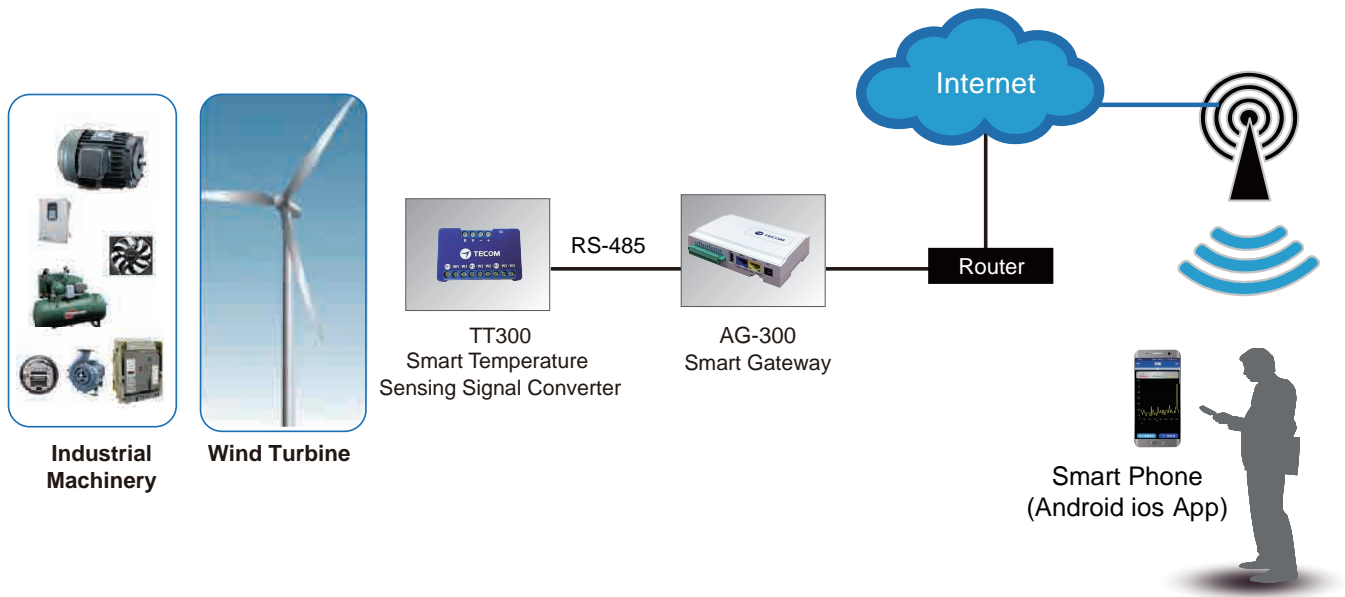
The product is easy to install, the temperature sensor (PT-100) is installed on the machine and the output signal is connected to the TT-300 input. The TT-300 is connected to the AG-300 IoT Smart Gateway by RS-485 communication (IoT -Gateway), after connecting to the Internet, can be directly connected to the smart phone, providing the owner with powerful "always connect" and "push notification", interactive and other mobile maintenance (Mobile Maintenance, MM) functions.

Deimension

54mm × 35mm × 16.9mm

Application Diagram

Industrial Machinery

Wind Turbine

TT300
Smart Temperature
Sensing Signal Converter

RS-485

AG-300
Smart Gateway

Internet

Router

Smart Phone
(Android ios App)
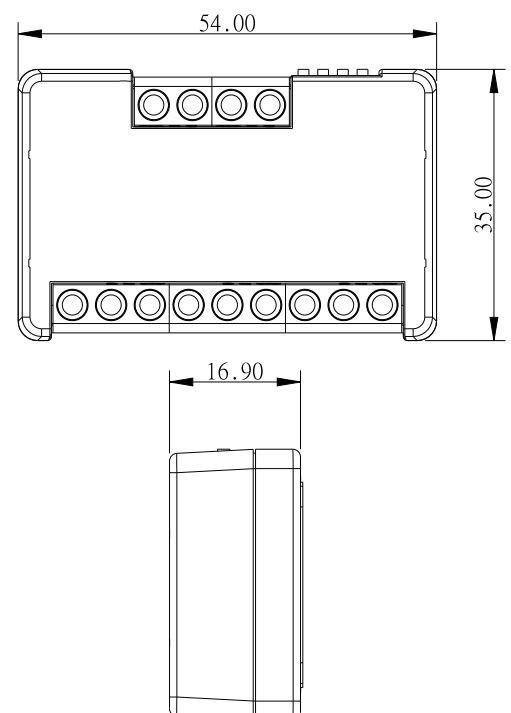
Specification

Power supply	12VDC
Power consumption	0.1A
Operation temperature	-20℃~85℃
Input signal	PT100．-100℃~300℃
Capacity	3 PT100 temperature sensors input
Output signal	RS485
Resolution	0.1℃
Accuracy	±1℃
Dimension	54 x 35 x 16.9mm
Weight	31g

Ordering Information

Model	Part Number	Description
TT-300	261-450570R	Temperature sensing signal converter, 3 ports of PT100 temperature signal input, 1 port of digital RS-485 signal output.

Signal Converter (Transducer)

AD-300

Analog-to-Digital Signal Converter

The AD-300 "Smart Analog Digital Signal Converter" is a must-have device for pressure, flow, vibration and other analog signal detection of new generation machine devices. On-site pressure gauges, flow meters, 4-20 mA vibration gauges and other analog sensors Measure 4-20mA or 0-10V analog signal, connect to the AG-300 intelligent IoT Gateway via AD-300 to RS-485 signal, and then connect to the network (wired or wireless) Connect to the mobile device APP or the Machine Health management platform (MHm) to perform remote monitoring, notification, alarm, and remote control operations on the pressure and flow conditions of the equipment.

Deimension

54mm × 35mm × 16.9mm

54.00

35.00

16.90

Application Diagram

Industrial Machinery — Pressure Gauge Flow Meter — Analog — AD-300 Analog-to-Digital Signal Converter — RS-485 — AG-300 Smart Gateway — Router — Internet — Smart Phone (Android ios App)
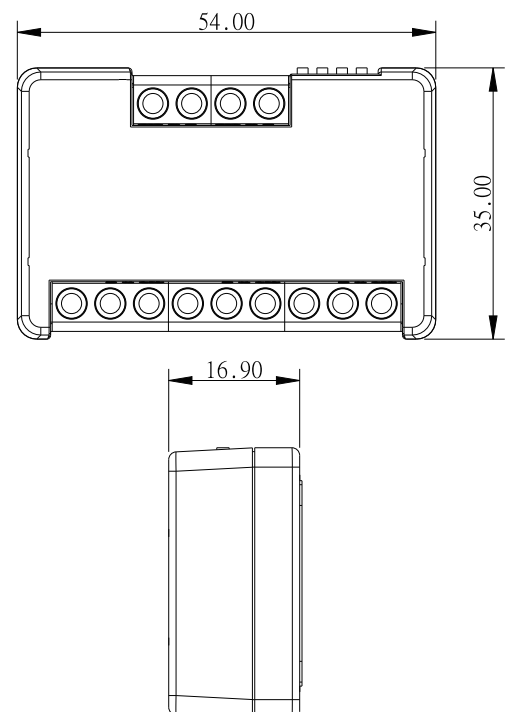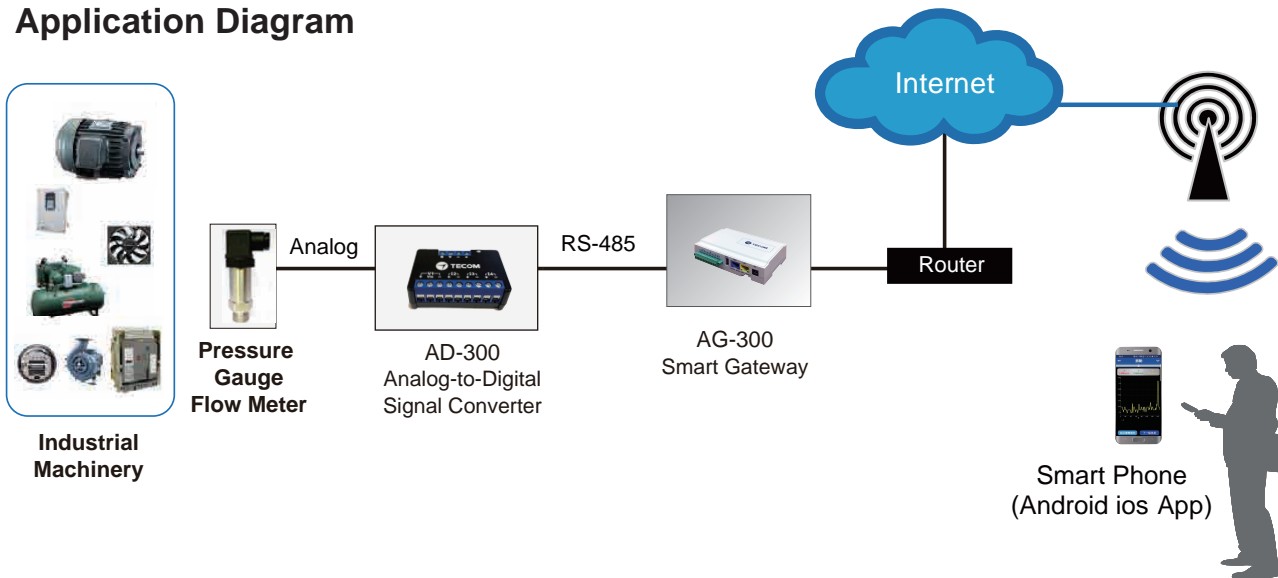
Specification

Analog input (Current)	3 Ports, 4 to 20mA, 16bit
Analog input (Voltage)	1 Port, 0 to 10V, 16bit
Output signal	RS-485
Accuracy Voltage Mode	0.2%(typical), 0.5%(max) for 0.3V to 10V 0.5%(max)+0.01V for 0V to 0.3V
Accuracy Current Mode	0.2%(typical), 0.5%(max) for 1mA to 20mA 0.5%(max)+0.01mA for 0mA to 1mA
Simultaneous measurement	RS-485
Noise tolerance	More than IEC61000-4-4 Level3: ±1KV spec.
Operating temperature	-40°C to +85°C
Power consumption	MAX. 270mA @ DC 12V
Power	DC 12V
Dimension	54 x 35 x 16.9mm
Weight	31g

Ordering Information

Model	Part Number	Description
AD-300	261-450571R	Analog-to-digital signal converter, 3 ports of 4-20mA and 1 port 0-10V analog signal input, 1 port of digital RS-485 output.

55

MMK Suit Combination
(Mobile Maintenance Kit)

MMK Upgrade Kit Overview

The MMK is used for long-term health management of critical machines (maybe 10% in the factory) that cannot afford to fail.

MMK upgrade kit (MMK/MHm)

- Permanent installation on the machine
- Provides instant monitoring, remote alarm, interactive diagnostics and
  other maintenance features
- Specially designed for life-cycle equipment that cannot be interrupted in the factory
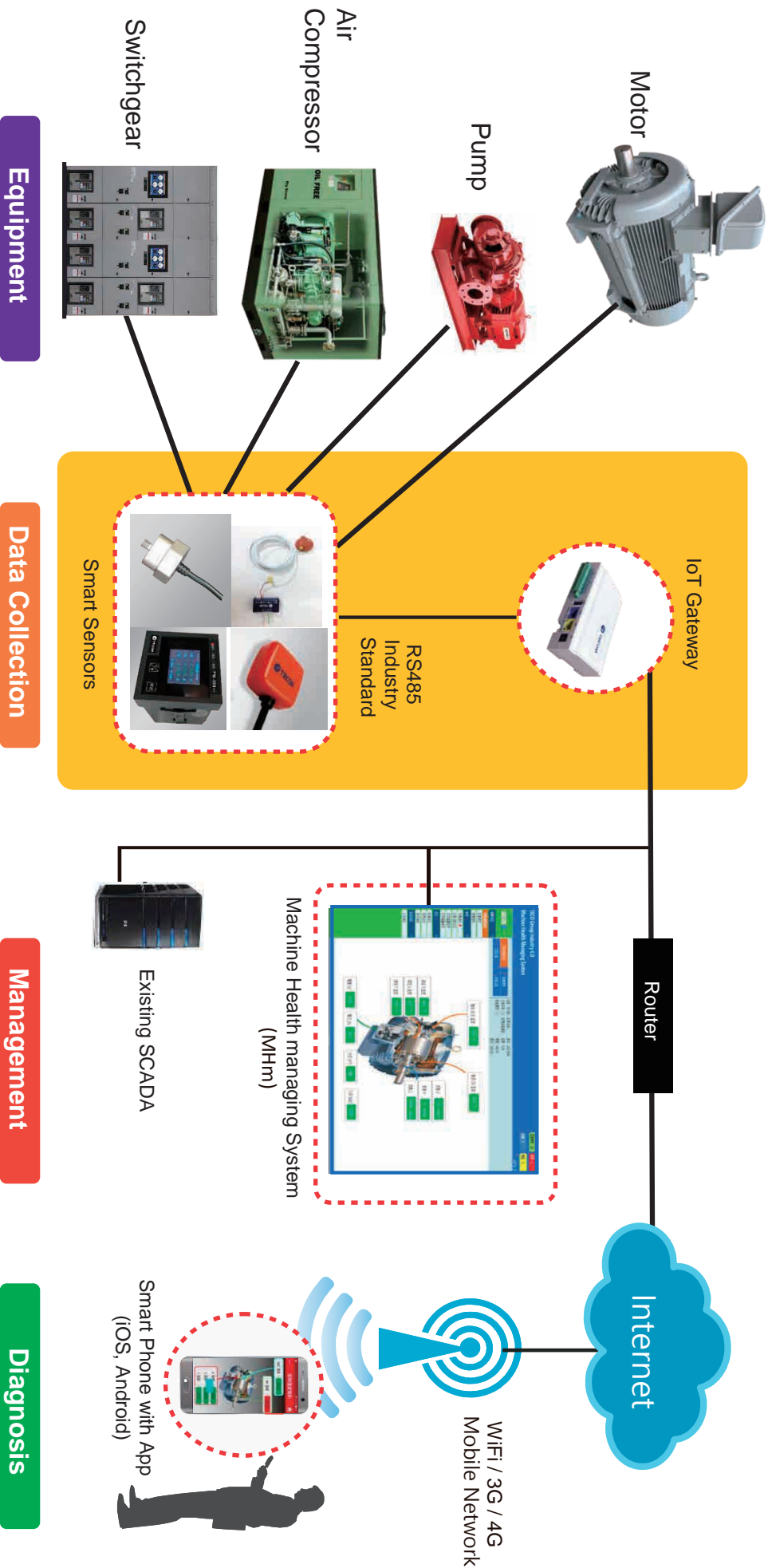
All remote operations are managed by Private Cloud, to protect operation privacy.

Equipment

Switchgear

Air Compressor

Pump

Motor

Data Collection

Smart Sensors

RS485 Industry Standard

IoT Gateway

Management

Existing SCADA

Machine Health managing System (MHm)

Router

Diagnosis

Smart Phone with App (iOS, Android)

Internet

WiFi / 3G / 4G Mobile Network

MMK (Smart upgrade kit),

Permanent installation

This smart upgrade package is installed on electromechanical equipment for a long time, and it continuously reports the operation status of the equipment every second. It uses IoT technology to match with remote smart phones to provide real-time monitoring, alarm and interactive diagnosis.

- Current I
  Voltage V
- Power
- Vibration V_{BR}

- Temperature T (Major part)
- Other parameter
  * Speed, torque

Monitoring and managing items：

Current	Temp.	Vibration	Power	Electricity record	Switch status

What to manage

the 5 machine vital data
   * Current * Voltage * KW Power * Temperature * Vibration

How to manage

Using IoT technology, the sensors work with remote smart phones, the vitals are managed remotely, Real-time and Interactively.

Features

* status reports on-demand
* Remote Alarms
   exceeding alarms, sudden change alarms, trending alerts,
   over consumption alarms.
* the Market-Leading interactive diagnosis on machine defects.

Special function

The MMK/MHm platform uses the IoT to connect at any time, and instantly pushes two core technologies to achieve health management features:

Sudden change alarm   **Interactive diagnosis**

These two features are not possible with traditional Web-Based systems. It also gives the platform an important advantage.

Benefits

To Maintenance Staff of both equipment makers and end users

- To have grasp of the machine operating status, at anytime and anywhere.
- Trending data of vital parameters help predict machine defects.
- Interactive expert diagnosis and cross-comparison help obtain more probable
  causes of defects, so that service dispatch will be far more effective, and can save
  big in repair time, manpower and cost.

To End users

- Critical machines are under close management.
- Machines at work are in best conditions.
- Increase productivity.
- Minimize unexpected down-time.
- Short repair and recovery time after defect.
- Optimum electrical power consumption.

MMK Suit Combination

MMK-2000
Smart Motor Set

Product Content :

- AG-300 Plus (Smart Gateway) x 1
- VB-200ST (Vibration Gauge) x 1
- TS-200 (Vibration Gauge) x 2
- PM-300 (Power Meter) x 1
- TT-300 (Temperature Sensing Signal Converter) x 1

Ordering Information

Model	Part Number	Description
MMK-2000	261-450129R	Smart motor set, AG-300 Plus x1, PM-300 x1, VB-200ST x1, TT-300 x1, TS-200 x2

SRRC IC

MHm
(Machine Health Management Software)

MHm Smart Machine Health management platform

MHm platform provides the core technology of factory equipment maintenance, providing the measurement of five major life signs (vibration, temperature, voltage, current, power) of electromechanical equipment, and analysis, diagnosis, instant warning/alarm, trend analysis, large-scale Data database establishment and management.

MHm system integration innovation, leading the market :

- Integrate vibration, temperature, voltage, current, power, pressure, flow measurement and diagnostic functions

- Innovative micro-intelligence machine health management system, which can use mobile phone as system host, especially suitable for small and medium-sized factories
IoT Gateway has built-in switch function, which can provide multi-sensor, multi-user, multi-site application, simultaneous, off-site, and heterogeneous (concurrent), which is a progressive IoT application.

- Major six functions: instant information, trend notification, remote alarm, remote shutdown (Option), normal energy offset warning, and interactive diagnosis and maintenance advice.

- The system realizes that IIoT is always connected, and the special technology is one of the few systems in the world that can provide sudden changes in electromechanical equipment.

- Monitor 5 major life signs (vibration, temperature, voltage, current, power) of electromechanical equipment for a long time and provide trend warning function.

Equipments

Sensors/converters

IoT Gateway

Air Conditioning

Air compressor

Lighting

Distribution

water supply

power

RS485

MHm system

Ethernet Switch Hub

Broadband

Internet

MMK APP
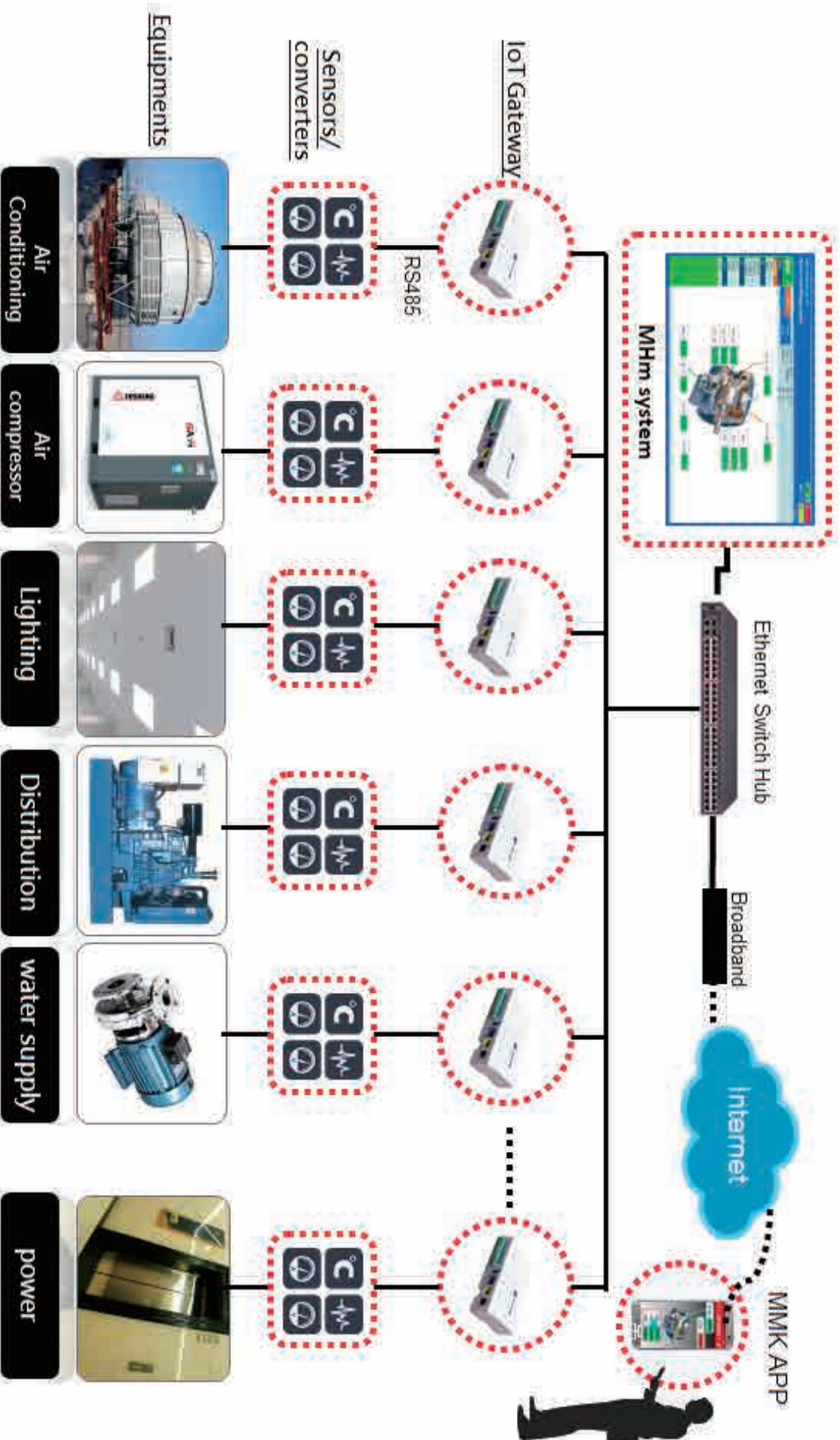
Note: The Smart Machine Health Management Platform plans to monitor up to 300 IoT Gateways per server, nd more than 300 Gateway sites require a cloud solution.

MHm Software

Software Display (server-based)

MHm provides data management for exclusive monitoring parameters for different types of equipment, such as motors, switchgears, pumps, air compressors, etc., providing real-time data, warning, alarm, trend analysis, diagnostics,

Motor

Switchgear

MHm Software

MMK APP Display

MMK APP provides real-time connection and real-time remote monitoring, alarm, diagnosis and other functions to the equipment. It can grasp the health status of the whole plant and ensure the production capacity can be achieved whenever and wherever.

Temperature

Vibration

Alarm

Ordering Information

Model	Part Number	Description
MHm w/10 licenses	565-800415R	Smart machine health management software with 10 machine licenses
MHm w/300 licenses	565-800416R	Smart machine health management software with 300 machine licenses
Add on 1 licenses	565-800417R	Add on 1 machine license
MHm-API	565-800418R	Smart machine health management software with API interface support

TEC🌀 Group

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