New Product

Graphical Panel Meter

WPMZ

Application Example

-987.654 mL/min

CE 66 Dustproof & Water Resistant Structure IP66 Front bezel

DC Voltage / Current Meter **WPMZ-1** | Strain Gauge Meter **WPMZ-3** | Rotation / Speed Meter **WPMZ-5** | Flow Rate / Flow Totalizer **WPMZ-6**

Watanabe Electric Industry Co., Ltd.

Application Examples Contents

1. WPMZ Series Overview

LCD display
Graphical Panel Meter

WPMZ Series

2.4 inch
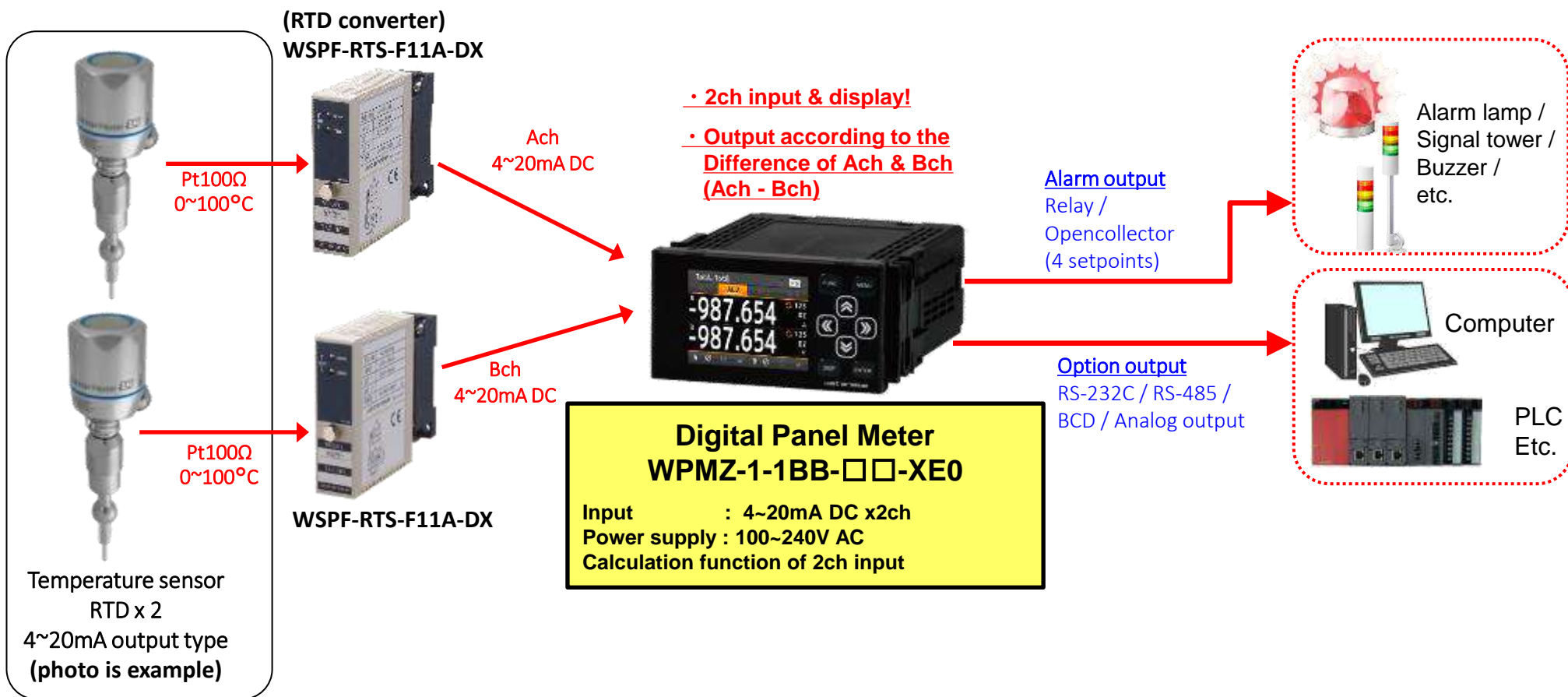**Full-color LCD**

★ **2.4 inch Full color LCD display**
★ **User friendly cross key setting**
★ **Display select**
  • Value, Bar graph, Trend graph switchable
  • Display direction (Horizontal / Vertical)
  • 62 Unit selectable & custom unit available
★ **2 input & calculation**
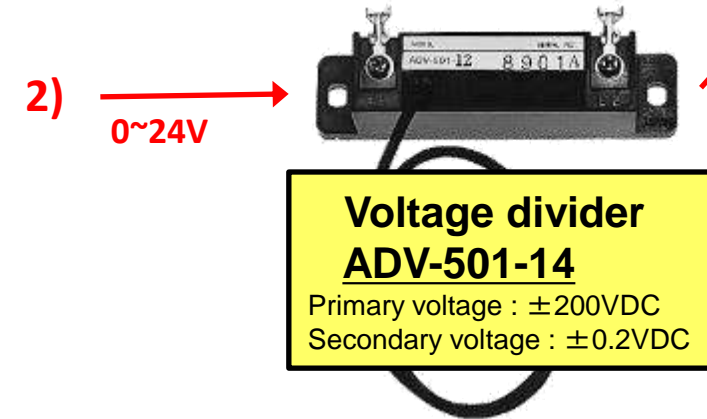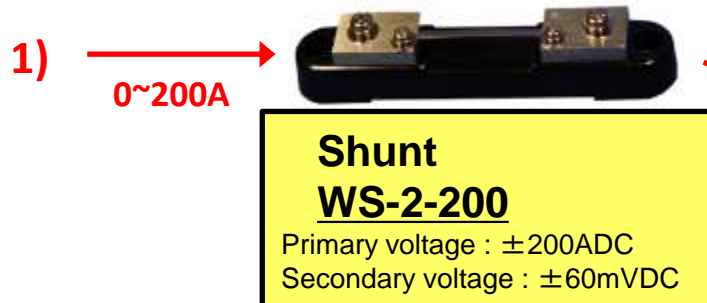★ **IP66 Front panel, Dustproof & water resistant**
★ **CE approved**

User friendly
Cross keys

CE

3

1) Convert RTD signal to 4-20mA by RTD converter WSPF-RTS-F11A-DX.
2) Input 2ch, Display Ach & Bch value in 1 display.
3) WPMZ-1 can **Calculate difference of 2ch input (Ach - Bch).**
   If calculation result is below or over setpoints (4 setpoints setting available)
   when one of RTD broken etc., then Relay signal will output to detect.

(RTD converter)
WSPF-RTS-F11A-DX

Pt100Ω
0~100°C

Ach
4~20mA DC

・**2ch input & display!**
・**Output according to the
  Difference of Ach & Bch
  (Ach - Bch)**

Alarm output
Relay /
Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

-987.654
-987.654

Bch
4~20mA DC

Pt100Ω
0~100°C

WSPF-RTS-F11A-DX

**Digital Panel Meter
WPMZ-1-1BB-☐☐-XE0**

Input   : 4~20mA DC x2ch
Power supply : 100~240V AC
Calculation function of 2ch input

Option output
RS-232C / RS-485 /
BCD / Analog output

Computer

PLC
Etc.

Temperature sensor
RTD x 2
4~20mA output type
(photo is example)

3. WPMZ-1 2ch Large current & voltage input

2ch input meter
   1) 200A input
   2) 24V input

1)
0~200A

Shunt
WS-2-200
Primary voltage : ±200ADC
Secondary voltage : ±60mVDC

Ach
0~60mV

2ch input & display!

-987.654
-987.654

2)
0~24V

Voltage divider
ADV-501-14
Primary voltage : ±200VDC
Secondary voltage : ±0.2VDC

Bch
0~24mV

2ch input meter
WPMZ-1-111-□□-XE0
Input 1 : ±99.999mV
Input 2 : ±99.999mV

Alarm output
Relay /
Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

Option output
RS-232C / RS-485 /
BCD / Analog output

Computer

PLC
Etc.
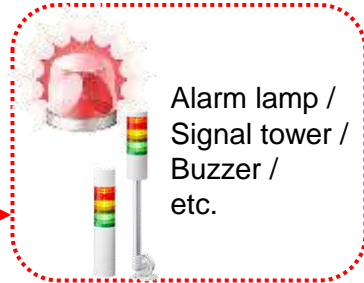
4. WPMZ-1 Thickness measurement by 2ch input

Displacement sensor A

Calculation result of 2 ch input = Thickness value

4~20mA

Displacement sensor B

4~20mA

987.654

WPMZ-1-4BB-□□-XE0

・2ch input 4-20mA
・Various calculation

Alarm output
Relay / Opencollector (4 setpoints)

Alarm lamp / Signal tower / Buzzer / etc.

Option output
RS-232C / RS-485 / BCD / Analog output

Computer

PLC Etc.

A (Sensor A value)

C = x-y
x = Total length
y = Rated width

y

x

B (Sensor B value)

Example of Calculation method

(A+B)+C) x K = Thickness value

A = Sensor A value (Ach input)
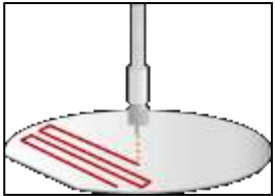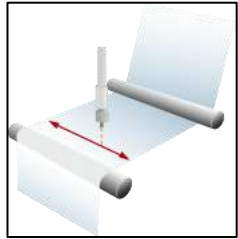B = Sensor B value (Bch input)
C = Total length (between A & B) – Rated width
K = -1

*C & K can set value by setting.
For example, if you want to display zero at 2cm width, and total length between A & B is 10cm, set 8 as C by setting. Then calculation result will be difference from 2cm rated width.

Wafer

FPD

Plating

WPMZ-1

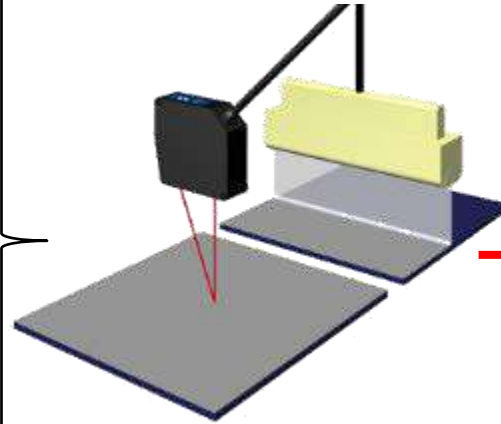**Thickness measurement
Displacement sensor**

Analog signal
(current / voltage)

Measure integrating current,
and outputs when Integrating
current is at constant value

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6. WPMZ-1 2ch input & Analog output of higher value

Set WPMZ-1, 2ch calculation to "HiSelect".
This function calculate Larger value of Ach & Bch.
Set Analog output setting to output Calculation result.

Then you can output larger value of Ach & Bch by Analog output 4~20mA.

INPUT   **OUTPUT**

Pressure sensor A

**Ach
4~20mADC**

-97.654

**Bch
4~20mADC**

Pressure sensor B

Option output
Analog output
WPMZ-1 can select output from
(Ach / Bch / Calculation result)

Please select Calculation result
to output higher value of Ach or Bch

**LCD Digital panel meter
WPMZ-1-1BB-1R-XE0**

Input : 2ch 4~20mADC
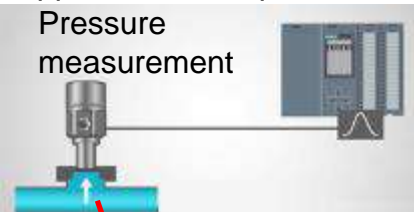Output : Higher value of Ach or Bch
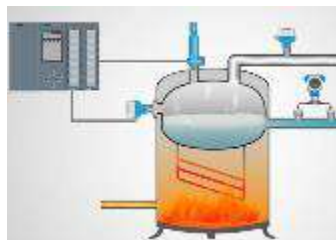   by 4~20mA
Power supply : 100~240VAC

Measure Pressure / Level of Water / Gas etc.,
by WPMZ-1 (DC current / voltage meter) connecting with pressure sensor / Level sensor.

Application example

Pressure measurement

Pressure measurement

Level measurement

BD Sensors (example)

BD Sensor : https://www.bdsensors.de/en/

Pressure sensors

Level Probes

Etc.

4~20mA
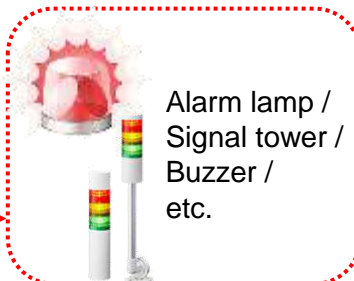
Power supply
12V/24V
to sensor

-97.654

DC Voltage / Current meter
WPMZ-1 series

Input : 4~20mA
(DC Current/Voltage)

Alarm output
Relay /
Opencollector
(4 setpoints)

Option output
RS-232C / RS-485 /
BCD / Analog output

Alarm lamp /
Signal tower /
Buzzer /
etc.

Computer

PLC

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Garbage weight

Crane system

Alarm output
Relay /
Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

(Example)

Loadcell signal
-3.5mV/V~3.5mV/V

987.654

Option output
RS-232C / RS-485 /
BCD / Analog output

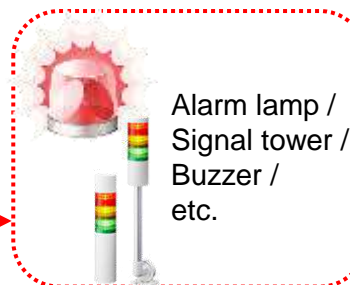Computer

PLC
Etc.

Load cell
For 3 ton or more
Rated output : -3.5mV/V~3.5mV/V

Load cell meter
WPMZ-3-□-SX-□□-XE0
Input : -3.5mV/V~3.5mV/V
Relay output : 4 set point (AL1/AL2/AL3/AL4)
Option output : Analog/RS-232C/
                         RS-485/BCD
Power supply : Please inform

9. WPMZ-3 Surface measurement by Lasor sensor

Measure surface of roof tile by Lasor sensor, and OK/NG judgement by compare result.

WPMZ-3-1BX-□□-XE0

Lasor sensor
(Displacement sensor)

4~20mA

-987.654

Alarm output (4 setpoint)
Relay / Opencollector

Alarm lamp /
Signal tower /
Buzzer /
etc.

Option output
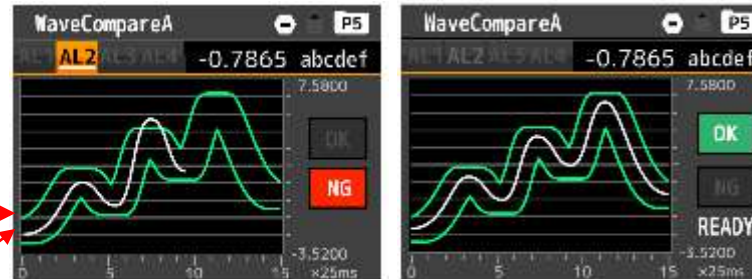RS-232C / RS-485 /
BCD / Analog output

Computer

PLC
Etc.

Roof tile

Wave compare display (OK/NG judgement)

1)   Create Comparison waveform.
2)   Start measuring at Trigger ON by external control function.
3)   Measure and compare with comparison waveform.
4)   Alarm output by relay when NG.
       (NG when measurement waveform is over comparison waveform)

(Display example)

Comparison waveform
(Green line)

Measurement waveform
(White line)

NG display   OK display

Conveyor at Site

Weight measurement of Conveyor at Site

Load cell

x2ch
Load cell
input

-987.654

Alarm output
Relay / Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

Option output
RS-232C / RS-485 /
BCD / Analog output

Computer

PLC
Etc.

Strain gauge meter WPMZ-3

・2ch Load cell signal input
・2ch calculation function
・LCD Display
・Waveform comparison
・Multi hold function
・Alarm output (Relay / Open collector)
・Option output
　(BCD / Analog / RS-232C /RS-485)

Waveform comparison

TML
Strain Gauge
UBF series

Input
Strain gauge signal
-3.5mV/V~3.5mV/V

987.654

Strain gauge meter
WPMZ-3-1SX-□□-XE0

Input   : Strain gauge input
Relay output   : 4 set point (AL1/AL2/AL3/AL4)
Option output : Analog / RS-232C / RS-485(Modbus) / BCD
Sampling speed : High speed **1**ch : 4000 times/sec

Output

Alarm output
Relay / Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

Computer

Option output
RS-232C / RS-485 /
BCD / Analog output

PLC
Etc.
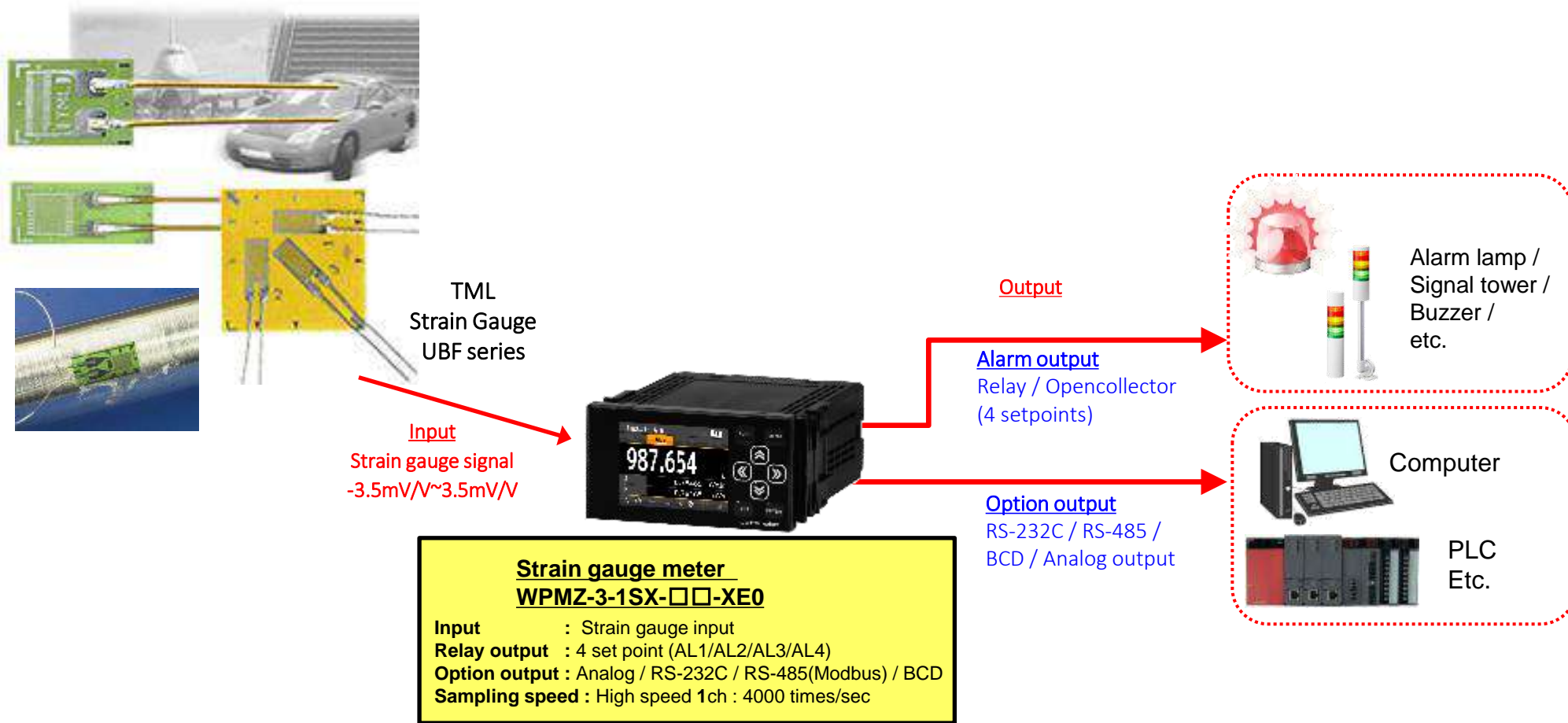
Measure tension (Force) in rolls of wires, cables and similar materials, by WPMZ-3 (Strain gauge meter) connecting with tension sensor.

Application example
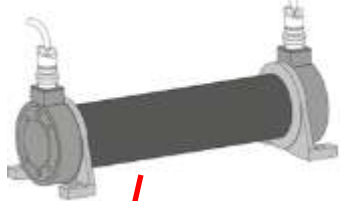
FMS RMGZ

FMS C series

FMS LMGZ

Tension (Force) sensors (Example)

FMS : https://www.fms-technology.com/en/

FMS RMGZ

FMS LMGZ

FMS C series

Etc.

0~1.8mV/V
(350Ω)

-97.654

Power supply
2.5V/5V/10V
to sensor

Strain gauge meter WPMZ-3 series

Input : -3.5mV/V~3.5mV/V

Alarm output
Relay /
Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

Option output
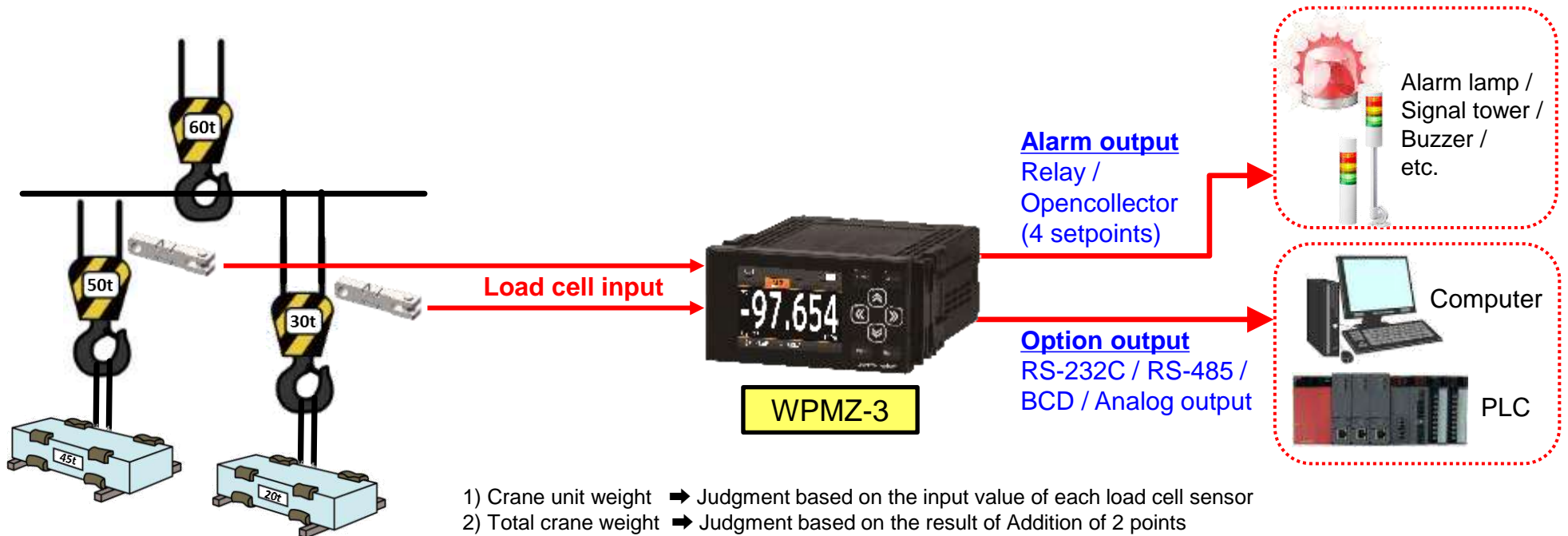RS-232C / RS-485 /
BCD / Analog output

Computer

PLC

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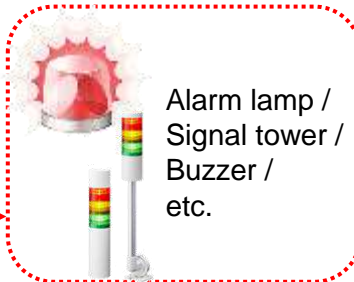
13. WPMZ-3 Crane weight monitoring

2ch input and 4 point alarm settings of WPMZ-3 enable low-cost crane weight monitoring.

**Since one WPMZ-3 can manage the weight of a single crane and the total weight,
weight management using a summing box and multiple indicators are not required.
It is also possible to send data to a computer as alarm output or data for safety management.**


Alarm output
Relay /
Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

Load cell input

Option output
RS-232C / RS-485 /
BCD / Analog output

Computer

PLC

WPMZ-3

1) Crane unit weight ➡ Judgment based on the input value of each load cell sensor
2) Total crane weight ➡ Judgment based on the result of Addition of 2 points

AR1:A<50t
AR2:B<30t
AR3:A+B<60t

Supports applications where high-speed response is essential.
The peak value held by analog peak hold is processed at high speed at 3000 times per second, and judgment output is possible.
Ideal for applications with short takt times.

WPMZ-3

WPMZ-3

■ **Bolting Machine**

■ **Spinning Machine**

-97.654

-97.654
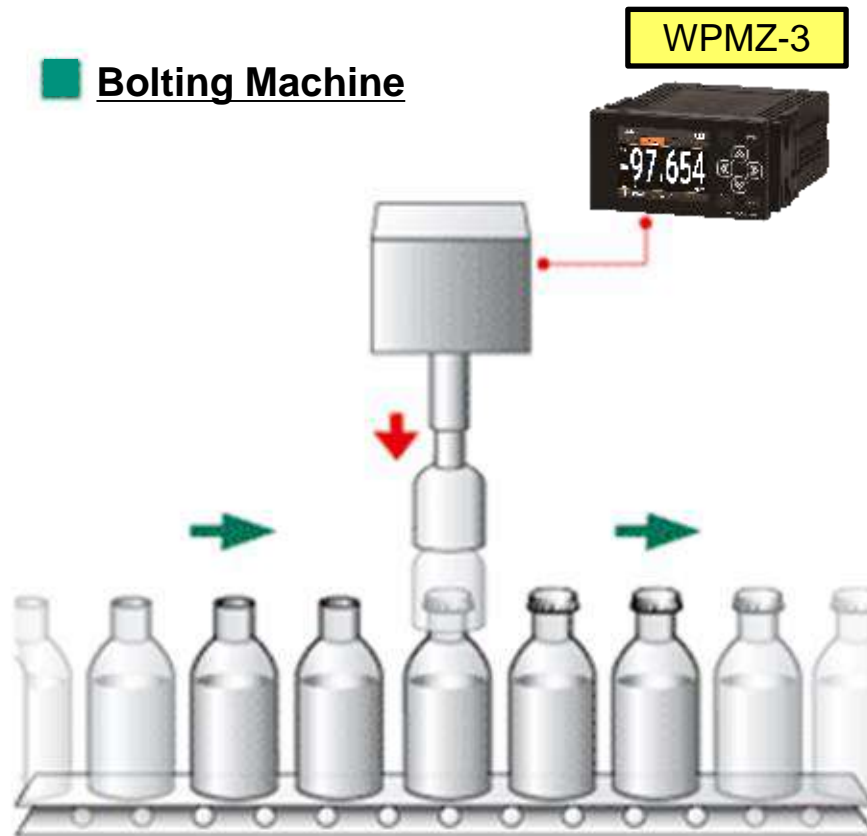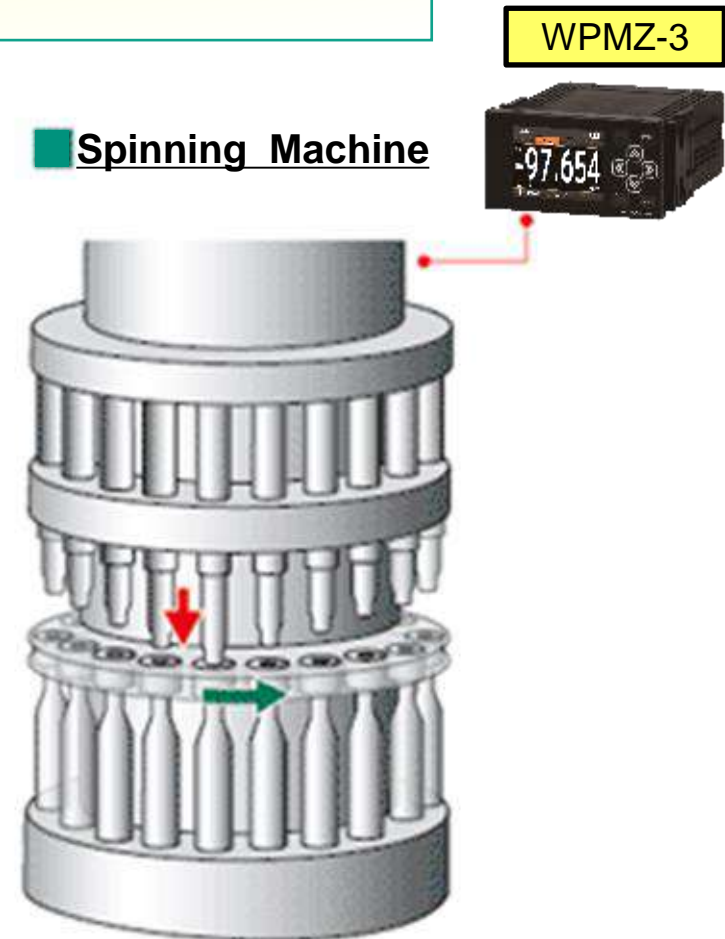
15. WPMZ-3 2ch input applications

■ Tension measurement

WPMZ-3

■ Automotive Parts Tensile / Compression Test

WPMZ-3

■ Press machine weight measurement
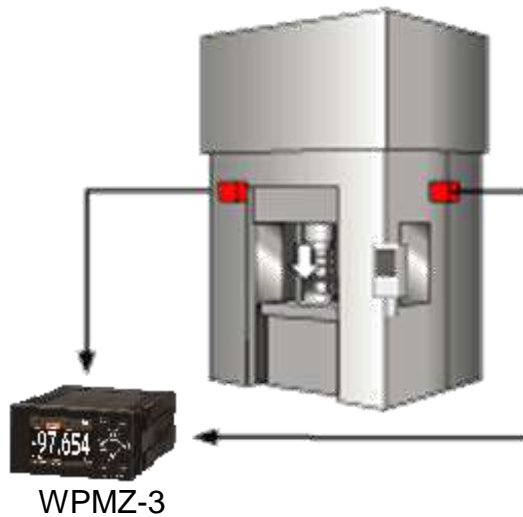
WPMZ-3

■ Clane weight measurement
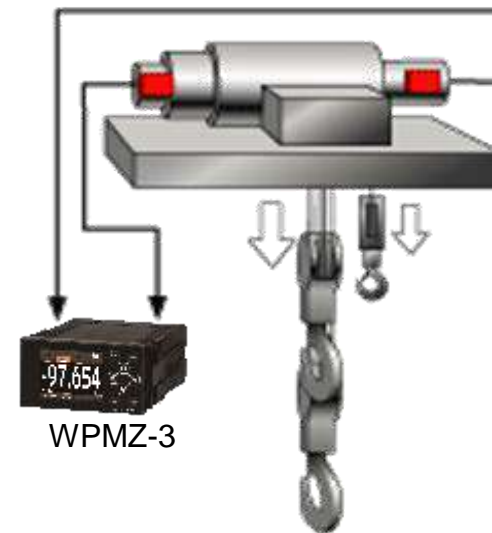
WPMZ-3

Weight measurement of cylinder with a scale load cell

WPMZ-3

-97.654

Low floor scale load cell

Control of the weight mixer

WPMZ-3

-97.654

Loadcell

PLC

Automotive mission axial force measurement

WPMZ-3

-97.654

Liquid gas remaining amount measurement

-97.654

WPMZ-3

Low floor scale load cell

WPMZ-5 Application : Conveyor

Rotation and Speed measurement of conveyor by WPMZ-5

Example

Drum filling Machine

Difference of Conveyor speed

WPM **Z**

Conveyor

Delivery roll

Rotary encoders

Rotary encoders

Pull roll

Input 1

WPM**Z**-5

Input 2

-987.650

Output
(Analog/BCD,
RS232C/RS-485/
Open collector (AL1~AL4))

PLC etc.   Computer
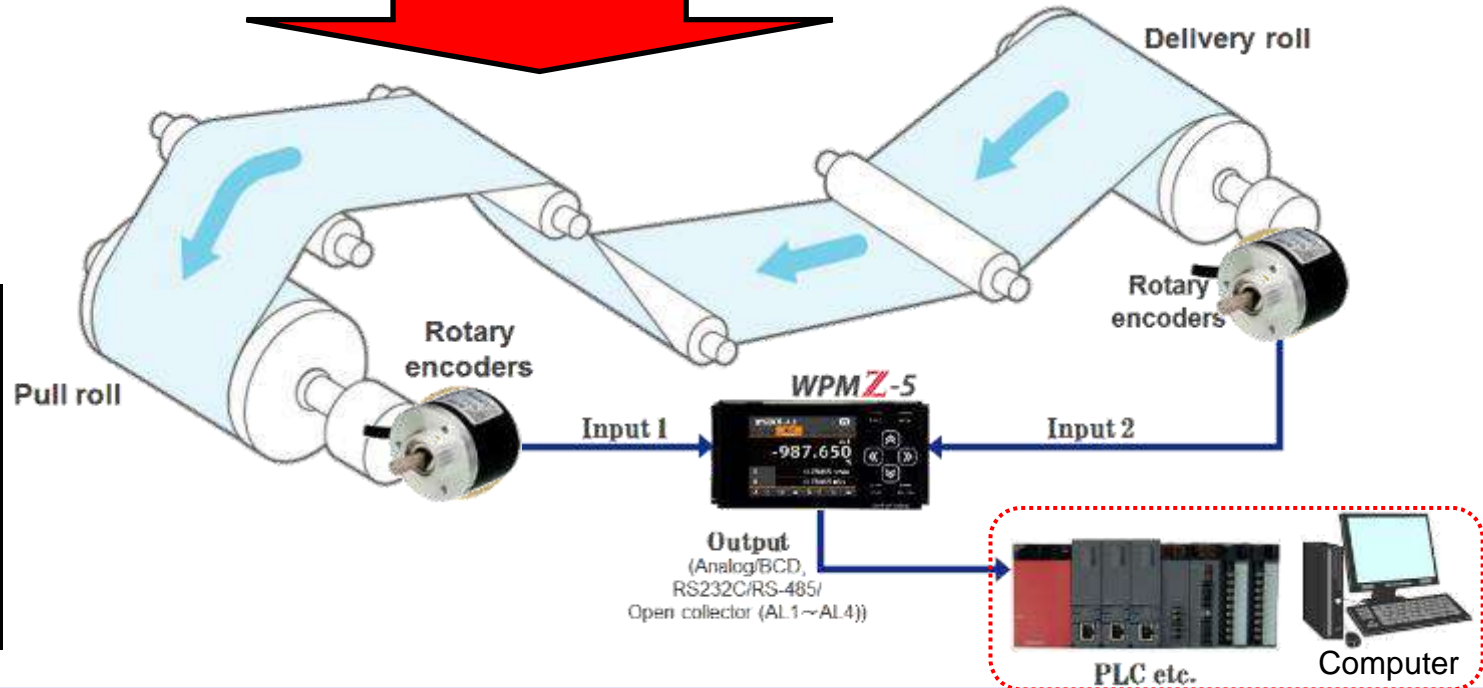
2 input Calculation	Calculation method
Absolute ratio	(B/A)×100
Relative error	(B/A-1)×100
Subtraction	B-A
Density	(B/(A+B))×100
Sum	A+B

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Rotation and Speed measurement of Tire by WPMZ-5

Tire Test System

1) Rotary encoders
2) Speed sensors
Etc.

Input
(Pulse signal)

-987.650

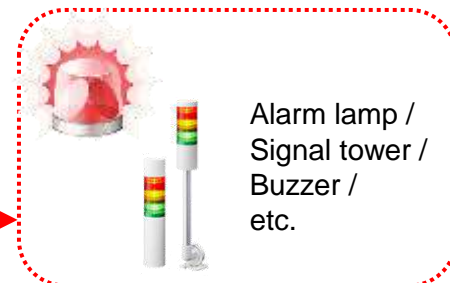### Rotation / Speed meter
WPMZ-5 series
・2 input available
・Measure Rotation & Speed
・Pulse signal input

Alarm output
Relay / Opencollector
(4 setpoints)

Option output
RS-232C / RS-485 /
BCD / Analog output

Alarm lamp /
Signal tower /
Buzzer /
etc.

Computer

PLC
Etc.

Connection of MODBUS TCT master and MODBUS RTU slaves (WPMZ-6)

**Modbus RTU
Slave device**

**Modbus TCP
Master device**
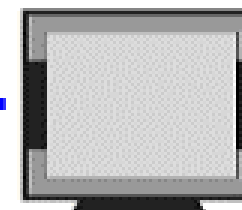
Ethernet

Modbus TCP Gateway
(Example)
  LINEEYE
  SI-485MB series

Control PC

WPMZ-6-1PX-5R-XE0

Input   : 1ch Pulse input
Option output : RS-485 Modbus RTU
Power supply : 100~240V AC

Stabilize the mixing process by monitoring
the difference of flow rate between two different liquid

2 input Calculation	Calculation method	WPMZ-6	
		Instantaneous	Totalized
Absolute ratio	(B/A)×100	○	×
Relative error	(B/A-1)×100	○	×
Subtraction	B-A	○	○
Density	(B/(A+B))×100	○	×
Sum	A+B	○	○

Tank A

Tank B

Signal tower etc.

Open collector output
(AL1～AL4)

Computer etc.

RS-232C/RS-485 output

Flow Sensor

Flow Sensor

WPMZ-6

-987.650

Analog output

Input 1

Input 2

PLC etc.

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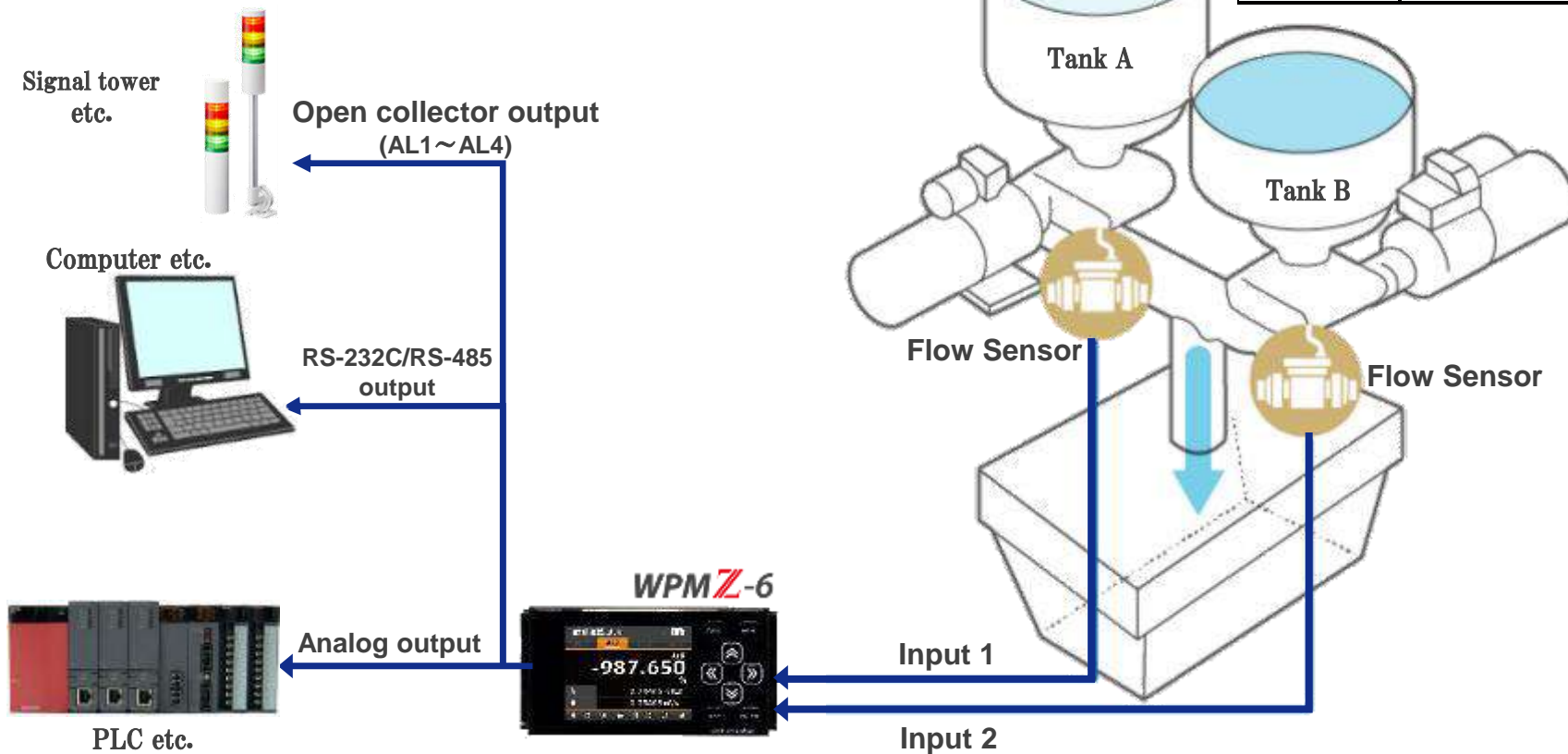
Hydraulic pressure dispenser

Flow meters

Input
(Pulse signal)

Alarm output
Relay / Opencollector
(4 setpoints)

Alarm lamp /
Signal tower /
Buzzer /
etc.

Option output
RS-232C / RS-485 /
BCD / Analog output

Computer

PLC
Etc.

-987.650

Flow meter WPMZ-6 series
・2 input available
・Measure Flow rate / Total flow
・Pulse signal input