

# I/O SOLUTION PRODUCTS

1	Four-wire Signal Conditioners
2	Two-wire Signal Conditioners
3	Power Monitoring Components
4	Indicators & Tower Lights
5	Remote I/O
6	Paperless Recording System
7	Process & Temperature Controllers
8	IoT Components
9	Final Control Components
10	Lightning Surge Protectors



# CATEGORY INDEX

PC / DCS / PLC



Sensors / Transmitters

Mobile terminals (smartphones, tablets) or mobile network operator services are not our products.

SCADA Software



Limited to Japanese Market



Process & Temperature Controllers

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Tower Lights

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Remote I/O

Page 19-26



CC-Link CC-Link IE field CC-Link IETSN  
 DeviceNet EtherNet/IP EtherCAT  
 Modbus Modbus/TCP  
 LONWORKS MECHATROLINK HLS  
 FL-net T-Link  
 OPC UA

• Wireless I/O System  
 For Limited Markets



Final Control Components

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CC-Link  
 DeviceNet  
 Modbus



Isolation Amplifiers



Power Monitoring Components

Page 14-15



CC-Link Modbus  
 Modbus/TCP LONWORKS






# FOUR-WIRE SIGNAL CONDITIONERS

A signal conditioner is used to condition and convert a field sensor signal suitable for processing with the PLC/DCS in a wide variety of process plants and factories. Typical applications are:

- ✓ **Signal conversion**
- ✓ **Signal isolation to stop ground loops**
- ✓ **Signal boosting to increase load drive capability**

Our signal conditioners are available with wide combinations of process signal I/O, power input and mounting configuration. Additionally, we offer the broadest line of signal splitters available.

## Choose by Housing and Terminal Access Styles

- Plug-in base socket mounted
- Terminal block style
- Euro terminal block style
- Ultra-slim housing
- Installation base mounted
- Rack mounted
- Field enclosure mounted
- Sensor head mounted
- PCB mounted
- Connector output

## Choose by I/O Signal Types

- Universal input
- DC mV, V, mA
- Two-wire transmitter
- Temperature
- Potentiometer
- Strain gauge
- CT & VT
- Frequency and pulse
- Pneumatic
- AC power
- And others

## Choose by Functions

- Isolation / Amplification
- Conversion / Transmission
- Signal splitting
- Limit alarm
- Filtering
- Math / Process function
- Linearization

## Choose by Power Supply

- AC line powered (4-wire)
- DC line powered (4-wire)
- Output loop powered (2-wire)
- Input loop powered (self powered)

Simulation experiments demonstrate effectiveness of isolators



How to choose DC signal isolators



## ISOLATOR APPLICATIONS 1

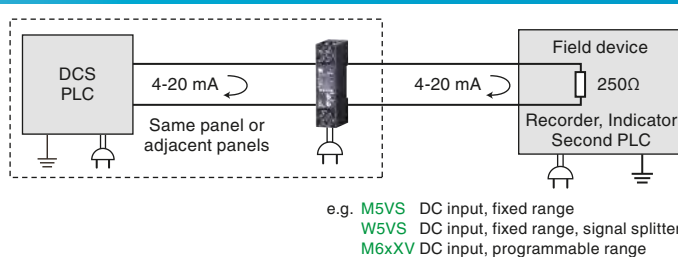
Isolator is installed between a transmitter (i.e. sensor) and a receiver to galvanically isolate DC signals.

Breaking the path between a field instrument and a control room device minimizes various influences coming from the field site to the control room.

In addition, each instrument separated by galvanic isolation can choose its own ground point independently from other ones, avoiding the 'ground loop' problem.

Lastly, the isolator can provide impedance conversion to beat loop impedance constraints, and signal level conversion (e.g. from 10-50 mA to 4-20 mA) function.

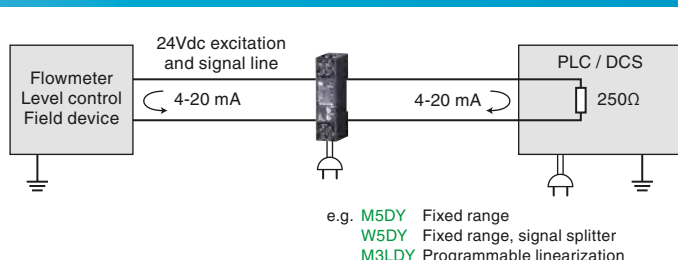
### 4-wire isolator : 4-20 mA (passive) input / 4-20 mA output / Line powered



Designed primarily for front-ending PLC/DCS systems which are mounted within the same panel or adjacent to it. The isolator module is powered from terminals separate from signal lines.

- Test and measurement applications
- Manufacturing cells
- Monitoring systems located in-line with the manufacturing process

### 4-wire isolator / current loop supply : 4-20 mA (active) input / 4-20 mA output / Line powered



Basic isolator designed to interface a PLC and DCS system with a field instrument. The isolator module supplies 24 Vdc power to the field device and provides a linearized output signal if necessary.

- Remote field signal monitored by control system
- Water/wastewater treatment
- Petrochemical, tank farms, large manufacturing sites

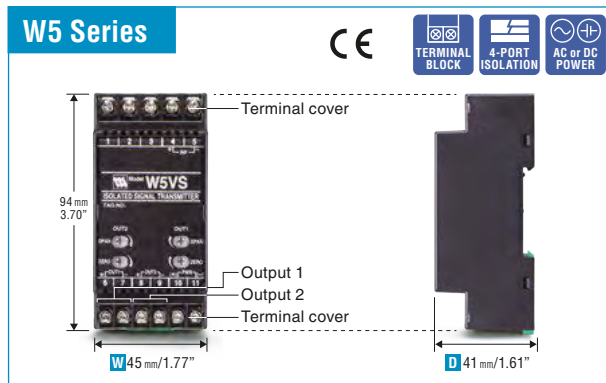
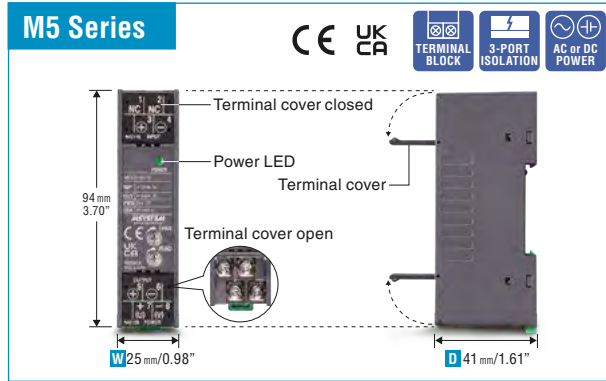


## Low-profile Signal Conditioners M5 / M5X / W5 Series

- Only 41 mm (1.61 in) deep, terminal block style modules can be installed anywhere, even behind the panel cover.
- M5X Series** PC programmable types have a convenient loop test output function.
- W5 Series** provides a second isolated output of independent range.



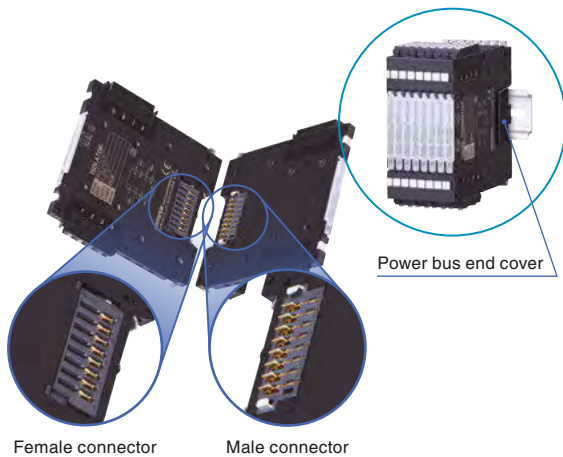
Compact, terminal block style housing



Four-wire Signal Conditioners
Two-wire Signal Conditioners
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## Ultra-slim Signal Conditioners M6 / M60 Series

- M6 Series** is available with three connection styles: Tension-clamp (M6S), screw terminal (M6N) or euro terminal (M6D).
- M60 Series** is available with separable tension-clamp terminal block or mini-clamp (e-CON) connector.
- Low power consumption, high load drive capability

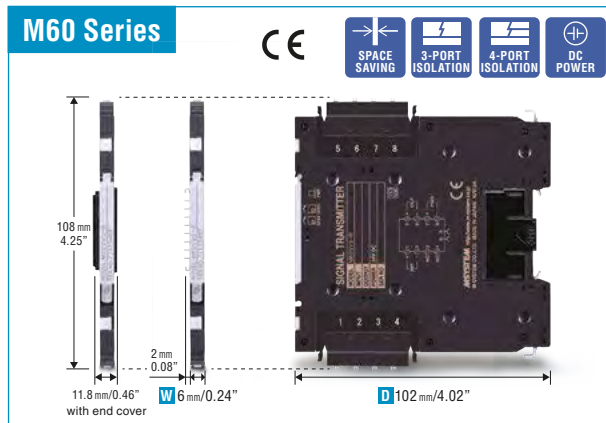
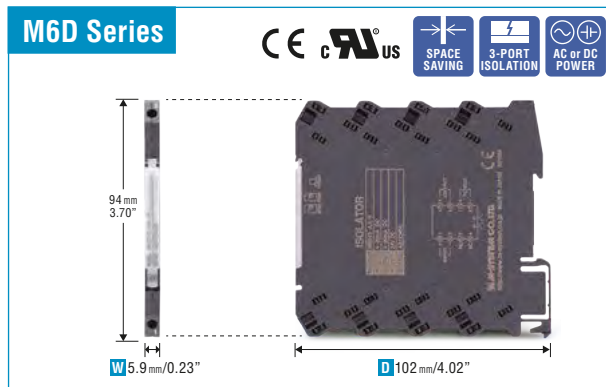


Female connector

Male connector

Power bus end cover

Highly reliable power bus connection: hooks and grooves sliding into each other (M60 Series)

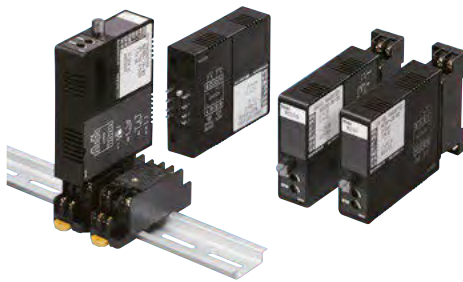


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# Compact Plug-in Signal Conditioners

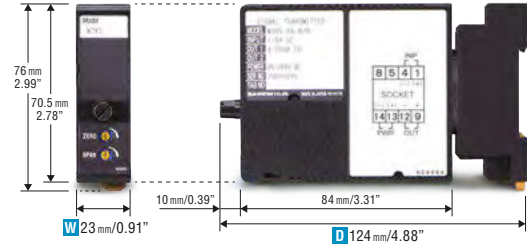
## M2 / M2E / W2 Series

- **M2/W2 Series** (Mini-M and Mini-MW) features a wide selection of input/output ranges and functions.
- **M2E Series** with bright, high-contrast OEL (Organic Electroluminescence) display for setup and process monitor
- **W2 Series** provides a second isolated output of independent range.
- PC programmable types have a convenient loop test output function.
- Base socket included with the modules

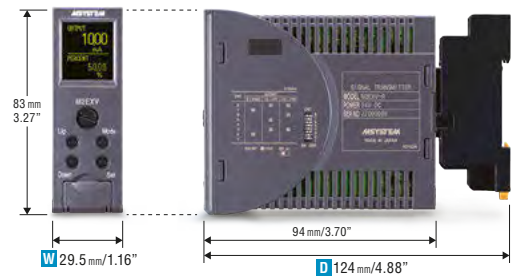


Plug-in socket mounted

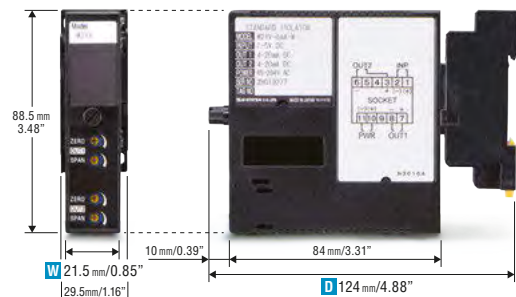
### M2 Series



### M2E Series



### W2 Series

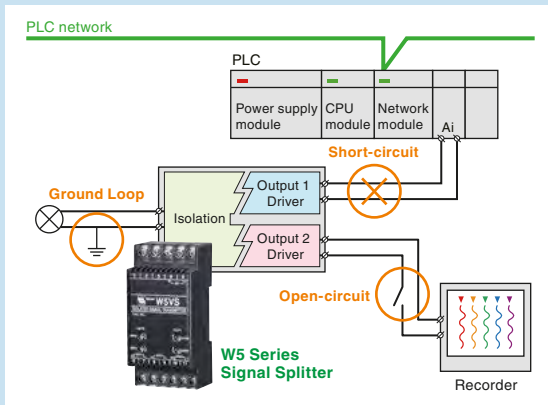


**M2E SERIES:**  
High-contrast OEL display makes loop checking easy for commissioning and maintenance

Multi display    Single display    Programming mode

Scrolling text

## Why Isolate the Second Output?



## Channel-to-channel Isolation Enhances the Overall System Reliability

Whenever you want to add another device such as a recorder to a sensor signal loop connected to PLC's analog input module, a signal splitter that can output two isolated signals is recommended.

The loop's load capacity may allow to connect one more load in series to (4-20 mA current signal) or in parallel to (1-5 V voltage signal) an existing receiving instrument. However, in such a configuration, short-circuit, open-circuit or ground loop at one part of the loop could affect the entire system.

Galvanically separating each part of the loop is beneficial to contain any damage to the limited section in case of an accident, thus to making troubleshooting easier, minimizing the system downtime.

## M3L Series

"One-Step Cal" Configuration without PC

- Enhanced PC configurator software is also available.
- Universal I/O specifications ideal for spare parts stock reduction programs



## M3S Series

12-mm Wide, Thin-profile Module

- Space-saving modules with separable terminal blocks
- Universal AC/DC power input available



## M8 Series

Direct Connection to PLC/DCS Plus Field Output



- Super-mini, plug-in modules
- 4-, 8- or 16-position installation base
- 4-20 mA output module available for control

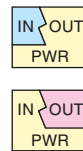
## 20 Series Isolation Amplifiers

Customized Hybrid IC

- Greatly saves development lead time for analog isolation circuitry
- Standardized product lineup as a second source of major suppliers
- RoHS compliant
- Two-port or three-port isolation
- $\pm 5$  V,  $\pm 10$  V input/output and other ranges
- Frequency characteristics options
- Withstand voltage up to 5000 Vac



### STANDARDIZED MODEL EXAMPLES



**20VS5-201**  
Linearity  $\pm 0.005\%$  TYP  
G=1 ( $\pm 0.01\%$  MAX)



**20VS5-202**  
Linearity  $\pm 0.01\%$  TYP  
G=1 ( $\pm 0.015\%$  MAX)



**20VS8-202**  
SIP or DIP  
3000 Vac isolation



**20VS8-210**  
Frequency characteristics  
Approx. 20 kHz



Simulation experiments demonstrate effectiveness of isolators

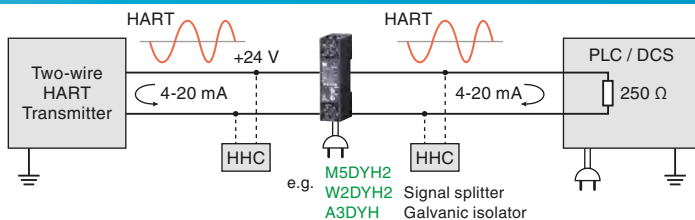


How to choose DC signal isolators



## ISOLATOR APPLICATIONS 2

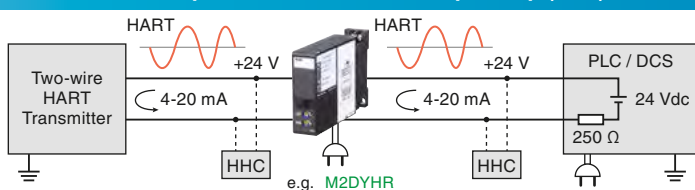
### 4-wire isolator / current loop supply : 4-20 mA (active) input / 4-20 mA output (source) / Line powered



Designed to interface a PLC and DCS system with a field HART transmitter. The isolator module supplies 24 Vdc power to the field device.

It also allows the HART signal to pass when a technician needs to access the transmitter's process and diagnostic information via the HART signal using a HART hand-held communicator (HHC), from any termination point of the loop at both sides of the isolator.

### When the receiver powers the isolator's output loop (sink)



- Remote field signal monitored by control system
- Water/wastewater treatment
- Petrochemical, tank farms, large manufacturing sites



# Function Modules & Retrofit Products

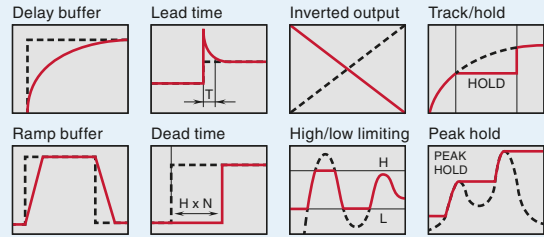
## Unique Functions for Stable Process Operations

- Math functions
- Process functions
- Filters
- Unique functions to ensure stable process operations and to solve problems in system upgrading



- Temp/pressure compensation
- Addition / Subtraction
- Multiplication / Division
- Ratio / Bias
- Delay buffer / Ramp buffer
- Moving average
- Lead time / Dead time
- Linearization
- Square root extraction
- Palmer-Borlus flume / Parshall flume
- Triangular/v-notch/rectangular weir
- Inverted output
- High / Low limiting
- Track / Hold
- Peak / Valley hold
- High / Low selecting
- Channel switching
- Parameter generator

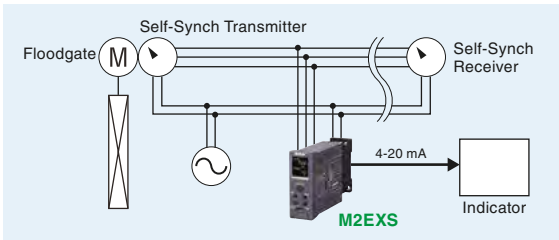
### I/O CHARACTERISTICS EXAMPLES



## Self-Synch Transmitter

### M2EXS / MXS

- Converting position signals from a self-synchronizing motor into a DC signal proportional to the rotating shaft position
- Position indication using self-synch, tank gauge, sounding level meter



## High Current Output Transmitter

### VA / SVA / 99SVA

- 200 mA, 1 A output to drive actuators used in turbines, speed governors, hydraulic machinery
- Retrofitting 10-50 mA loop



## Potentiometer Output

### CVR1

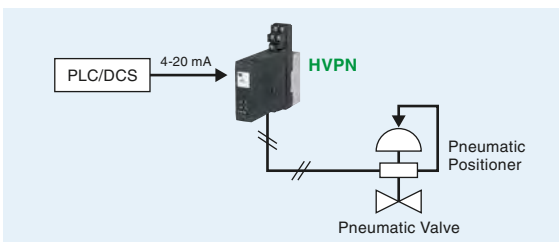
- Remote setting for dampers, inverters, motors and other devices with potentiometer settings
- DC voltage/current input
- 135 Ω, 1k Ω and other outputs



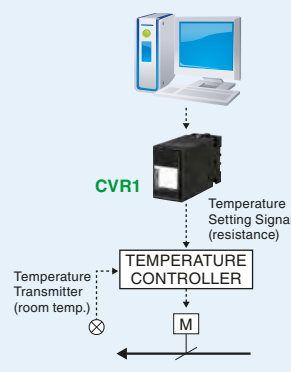
## I/P Transducer

### HVP / HVPN

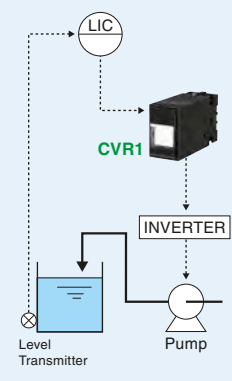
- Semiconductor pressure sensor in the feedback circuit
- Max. air capacity 60 NL/minute



### Damper Operation for Air Conditioning

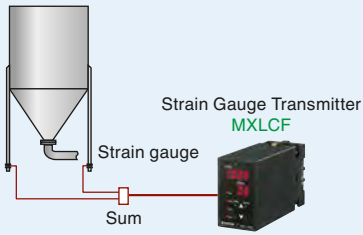


### Motor Speed Setting



# Strain Gauge Transmitters

## Tank / silo / hopper weighing system



The MXLCF, in conjunction with multiple high-capacity load cells (strain gauges), provides an effective tank weighing system, with easy field configuration and local display capabilities.

## "One-Step Cal" Configuration without PC M3LLC

- DIP switch or PC configurable
- <10 msec. response
- Auto tare feature controlled by PLC or DCS
- Manual on-site calibration



CE  
cRU<sup>us</sup>

## Fast Response Remote Sensing LCF

- Six-wire bridge
- <300 microsec. response (2 kHz, -3 dB)



CE

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

# Limit Alarms

## Quad/Octad Alarm with OEL Display M1EA Series

- Multi-line display showing parameters and selection in text: intuitive, easy programming
- 4-point SPDT or 8-point NO or NC contact (single-channel type)
- 2-point SPDT or 4-point NO or NC contact (dual-channel type)
- PC configuration is also available.



CE

## Dual/Quad Alarm with OEL/LCD Display M2EA / M7E Series

- Multi-line display showing parameters and selection in text: intuitive, easy programming
- 2-point SPDT or 4-point NO or NC contact
- PC configuration is also available.



M2EA Series CE M7E Series CE

## Dual/Quad Alarm with LED Display AS4 Series

- Simple configuration via the front Up/Down buttons with a help of two displays, by calling parameters' ID numbers (ITEM) and choosing values (DATA)
- Direct sensor input: DC, temperature, potentiometer, strain gauge and CT
- Field selectable sensor type and range
- 2-point SPDT or 4-point NO or NC output



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## Panel Surface Mount KS2V2 / KS2TR2

- 1/16 DIN size (48 mm square) panel cutout
- 1-5 Vdc input (KS2V2) or temperature (T/C or RTD) input (KS2TR2)
- Dual SPDT output



CE cRU<sup>us</sup>

## Simple Setting Analog Alarms

- Various setting methods are available: dial setting, thumbwheel switch setting, rotary switch setting, potentiometer setting.
- Direct sensor input type and extra DC transmitter output (AE-UNIT)



M2SED CE



M2AVS CE



AE-UNIT Series

About Us & Locations

# Four-wire Signal Conditioners Selection Guide



SERIES	M5		W5	M2 / M2E	
Enclosure / Mounting type	41 mm-deep low-profile housing, DIN rail mount			Plug-in base socket, DIN rail or surface mount	
Connection	M3.5 screw terminal		M3.5/M3 screw terminal	M3 screw terminal	
Dual output	---		Yes	(M2WVS)	
Power input	AC/DC			AC/DC	
Isolation	2000V AC (M5/AC powered type: 1500V AC)			2000V AC	
Operating temperature	-5 to +55°C (23 to 131°F) (M5X: -20 to +65°C (-4 to +149°F))			-5 to +55°C (23 to 131°F)	
Standards & Approval	CE / UKCA (DC powered type)		CE (DC powered type)	M2: CE / UKCA / UL / C-UL M2E: CE	
Range Availability	Fixed range	PC configurable	Fixed range (except W5FV)	Fixed range	PC configurable (M2) Front display setting (M2E)
<b>Isolators &amp; Sensor Inputs</b>					
Input loop powered isolator	M5SN			M2SN	
Isolator	M5YV				
Output isolator					
Universal input	M5XU			M2XU, M2XUM	
DC mV, voltage & current	M5VS, M5MV	M5XV	W5VS, W5FV	M2VS, M2WVS	M2FV, M2XV2, M2EXV
DC mV, voltage & current (fast response)	M5VF, M5VF2			M2VF, M2VF2, M2VF3	
Universal temperature input	M5XTR				
Thermocouple	M5TS	(M5XTR)	W5TS	M2TS	M2XT2, M2EXT
RTD	M5RS	(M5XTR)	W5RS	M2RS, M2RS1	M2XR2, M2EXR
Potentiometer	M5MS		W5MS	M2MS	M2XM2, M2EXM
Current loop supply	M5D, M5DY		W5DY	M2D, M2D2, M2DYS	
Current loop supply, SQR				M2DL, M2DNY	
Current loop supply, HART	M5DYH2			M2DYH2, M2DYHR	
Strain gauge			W5LCS	M2LCS	
AC voltage & current	M5TG*, M5AC*			M2TG, M2AC	
<b>Power Transducers</b>					
Voltage transformer	M5PT			M2PA, M2PE	
Current transformer	M5CT			M2CA, M2CE	
Clamp-on current sensor	M5CTC			M2CEC	
Multi power transducer	M5XWT, M5XWTU				
<b>Frequency I/O</b>					
Pulse to analog	M5PA	M5XPA	W5PA	M2SP	M2XPA3
Encoder	M5XRP			M2XRP2	
Analog to pulse	M5AP*			M2AP	
Pulse isolator	M5PP, M5YPD*			M2PP	
Pulse scaler, divider	M5PRU*			M2PRU, M2PDU	
<b>Pneumatic Transducers</b>					
19.6-98.1 kPa				M2PV	
<b>Function Modules</b>					
Multi function					
Four arithmetic functions	M5XADS, M5XSBS, M5XMLS, M5XDIS			M2ADS, M2SBS, M2MLS, M2DIS	
Ratio/bias	M5XREB, M5XRTS			M2REB, M2RTS	
Linearizer	M5XF			M2XF2	
Square root extractor	M5XFLS			M2FL, M2FLS (M2XF2)	
Limiter				M2LMS	
Inverted output	M5XUDS			M2UDS2, M2UDS	
Delay buffer				M2CDS	
Ramp buffer	M5XCRS			M2CRS	
Track/hold	M5XAMS			M2AMS2, M2AMS	
Peak/valley hold	M5XPHS			M2PHS2, M2PHS	
High/low selector	M5XSES			M2SES2, M2SES	
Analog switching module				M2MNV	
Parameter generator	M5XMST			M2MST	

\*Under development as of July 2023

Four-wire Signal Conditioners

Two-wire Signal Conditioners

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About Us & Locations



Only typical signal conditioner modules and specs are mentioned in this table.  
Please visit our web site to confirm availability and specs of specific models.

						<b>SERIES</b>
W2		M6 / M60		M3 / M3S / A3		
Plug-in base socket, DIN rail or surface mount		Ultra-slim housing, DIN rail mount		18 mm- or 12 mm-wide housing, DIN rail mount		Enclosure / Mounting type
M3 screw terminal		Tension clamp, M3 screw terminal, euro type terminal, mini-clamp (e-CON) connector		Euro type connector terminal		Connection
Yes		(M6xWVS, M60xWVS)		(M3SWVS)		Dual output
AC/DC		DC (M6xYV, M6xXU, M6xVS: AD/DC)		AC/DC		Power input
2000V AC		M6 Series: 2000V AC M60 Series: 1500V AC		2000V AC		Isolation
-5 to +55°C (23 to 131°F)		-20 to +55°C (-4 to +131°F)		M3: -20 to +65°C (-4 to +149°F) M3S: -10 to +55°C (14 to 131°F)		Operating temperature
CE / UKCA / UL / C-UL		M6: CE / UL / C-UL M60: CE		M3: CE / UL / C-UL, M3S: CE A3DYH: CE / ATEX / FM		Standards & Approval
Fixed range	PC configurable	Fixed range	PC configurable (M6) DIP SW setting (M60)	Fixed range	One-step cal (M3L) PC configurable (M3X)	Range Availability
Isolators & Sensor Inputs						
		M6xSN				Input loop powered isolator
		M6xYV, M60xYV			M3SYV	Isolator
						Output isolator
			M6xXU		M3LU2, M3LU	Universal input
W2VS		M6xVS, M6xWVS		M3SVS, M3SWVS	M3LV, M3SXV	DC mV, voltage & current
W2VF		M6xVF				DC mV, voltage & current (fast response)
						Universal temperature input
W2TS	W2XT		M6xXT		M3LT, M3SXT	Thermocouple
W2RS, W2RS1	W2XR		M6xXR	M3SRS	M3LR, M3SXR	RTD
W2MS	W2XM		M6xXM	M3SMS	M3LM, M3SXM	Potentiometer
W2DYS		M6xDY		M3DY, M3SDY	M3LDY	Current loop supply
W2DNY					(M3LDY)	Current loop supply, SQR
W2DYH2				A3DYH (IS)		Current loop supply, HART
W2TG, W2AC					M3LLC	Strain gauge
						AC voltage & current
Power Transducers						
W2PA, W2PE						Voltage transformer
W2CA, W2CE						Current transformer
		M6xCTC				Clamp-on current sensor
						Multi power transducer
Frequency I/O						
W2SP		M6xPA			M3LPA2	Pulse to analog
						Encoder
W2AP			M6xXAP			Analog to pulse
W2PP		M6xPP				Pulse isolator
						Pulse scaler
Pneumatic Transducers						
W2PV						19.6-98.1 kPa
Function Modules						
		M6XF1, M6XF2				Multi function
		M6XF2				Four arithmetic functions
						Ratio/bias
	W2XF		(M6XF1)			Linearizer
	(W2XF2)		(M6XF1)			Square root extractor
			(M6XF1)			Limiter
			(M6XF1)			Inverted output
			(M6XF1)			Delay buffer
			(M6XF1)			Ramp buffer
			M6XF3			Track/hold
			M6XF3			Peak/valley hold
			(M6XF2)			High/low selector
						Analog switching module
W2MST			(M6XF1)			Parameter generator

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# TWO-WIRE SIGNAL CONDITIONERS

Four-wire Signal Conditioners

Two-wire Signal Conditioners

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About Us & Locations

## DIN Rail-mount Signal Conditioners

### B5 Series

#### Low-profile Terminal Block Style

- Only 41 mm (1.61 in) deep, terminal block style modules can be installed anywhere, even behind the panel cover.
- Power LED
- 2000 Vac isolation between input and output



CE

### B3 Series

#### DIP Switch Configurable

- Input type and range selectable with the internal DIP switches and fine calibration using the front potentiometers
- Wide supply voltage range 12-45 Vdc
- 1500 Vac isolation between input and output



CE cULus

## Field-mount Signal Conditioners

### 27 / 26 Series

#### DIN Type B Head-mount Transmitters

- 27 Series:** HART or PC programmable type available
- 26 Series:** Fixed range



27 Series

CE Ex FM APPROVED



26 Series

CE Ex

### B6U / B6U-B

#### Universal HART Temperature Transmitters

- Plug-in two-line LCD display
- HART programmable
- User's own temperature calibration tables can be used.
- IP66 / IP67 field enclosure; Stainless steel optional



B6U



B6U-B

IP66/IP67

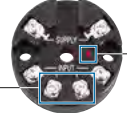
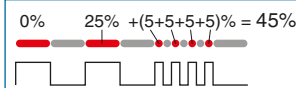
CE Ex FM APPROVED IECEx

#### High Accuracy



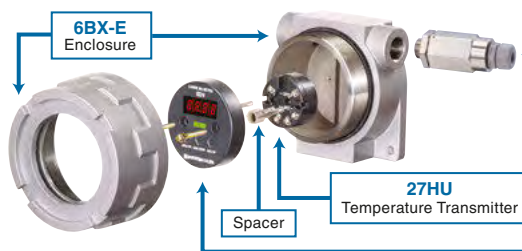
Pt100 CJC sensor placed between the input terminals (27HU, 27U, 27TS)

#### Function Monitor LED



Flashing patterns of the light can tell you input signal level in 5% increments (27R, 27RS, 27PM)

## FIELD-MOUNT ACCESSORIES



#### MD6 Series Surge Protectors

CE Ex FM APPROVED



#### 6DV / 6DV-B

#### 4-digit Loop Powered Indicator




6DV

6DV-B

CE Ex FM APPROVED



# Two-wire Signal Conditioners Selection Guide

					
SERIES	B5	B3	B6 / 27	27	26
Enclosure / Mounting type	41 mm-deep low-profile housing, DIN rail mount	18 mm-wide housing, DIN rail mount	Field mount enclosure	DIN type B head mount	
Connection	M3.5 screw terminal	Euro type connector terminal	M3.5/M3 screw terminal	M3 screw terminal	Euro type terminal block
Power input	Output loop powered				
Isolation	2000V AC	2000V AC	1500V AC		
Operating temperature	-40 to +80°C (-40 to +176°F)	-40 to +85°C (-40 to +185°F)	-40 to +85°C (-40 to +185°F)		
Standards & Approval	CE	CE / UL / C-UL / ATEX / FM	CE / ATEX / FM	CE / ATEX / FM	CE
Input loop powered isolator	B5SN				
DC mV, voltage & current	B5VS	B3VS/1, B3VS/2, B3FV			
Thermocouple	B5TS	B3FT		27TS	26TS1
RTD	B5RS	B3FR		27R, 27RS	26R1, 26RS
Potentiometer	B5MS			27PM	
Pulse		B3FP			
Universal input				27U	
Universal input, HART, IS		B3HU, B3HU2	B6U, B6U-B, 27HU-B	27HU	
Universal input, PROFIBUS		B3PA			

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

Simulation experiments demonstrate effectiveness of isolators

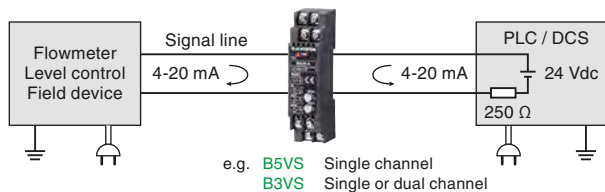


How to choose DC signal isolators



## ISOLATOR APPLICATIONS 3

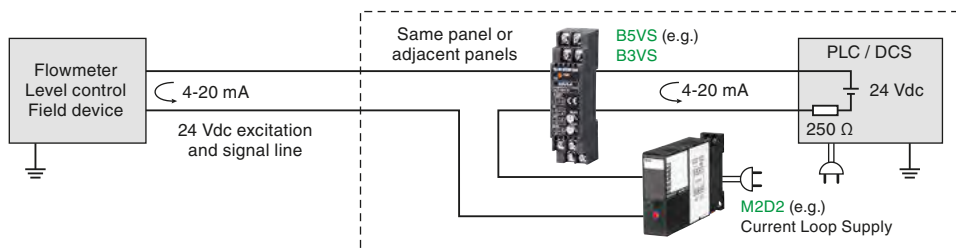
### 2-wire isolator : 4-20 mA input / 4-20 mA output (loop powered)



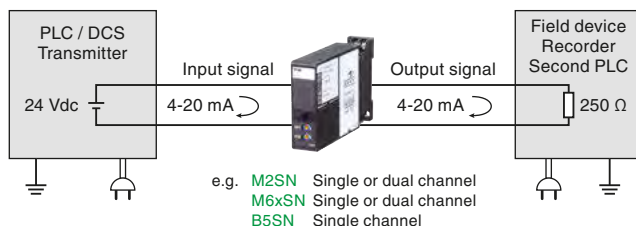
Basic isolator designed to interface a PLC and DCS system that provides a 24 Vdc power supply with a 4-20 mA input.

- Remote field signal monitored by control system
- Water/wastewater treatment
- Petrochemical, tank farms, large manufacturing sites

### With the excitation supply to the field device



### 2-wire isolator : 4-20 mA input (loop powered) / 4-20 mA output



Mainly used to retrofit existing 4-20 mA process loops that need to add another instrument to the loop while maintaining isolation.

- Chart recorder or another PLC
- Backup monitoring system

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# POWER MONITORING COMPONENTS

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

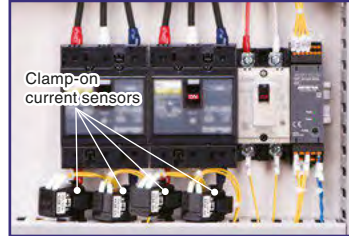
Final Control Components

Lightning Surge Protectors

About Us & Locations

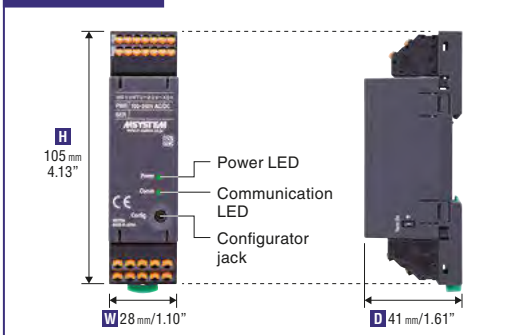
## Low-profile Multi Power Transducer M50XWTU

- Only 41 mm (1.61 in) deep, terminal block style modules can be installed even in shallow breaker boxes or on wall-mounted panels.
- Clamp-on current sensor input up to 600 A
- Single-phase 2-wire and 3-wire, three-phase 3-wire and 4-wire systems
- Max. 4 circuit inputs for single-phase/2-wire system, max. 2 circuit inputs for single- or three-phase/3-wire system
- Up to 31st harmonic distortion measurement
- Modbus plus two contact outputs (energy count pulse)

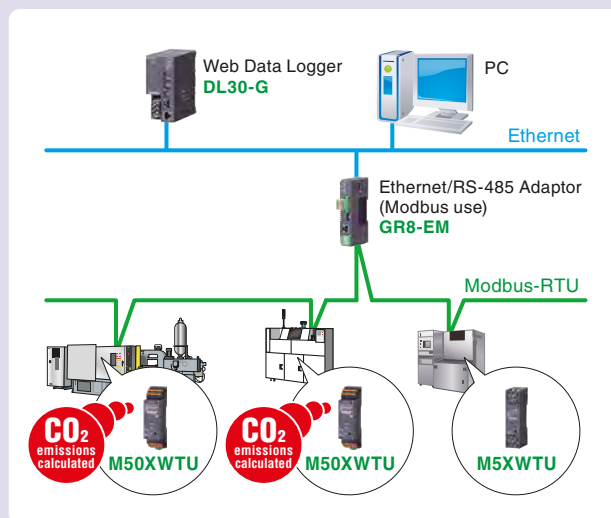


CE  
Modbus

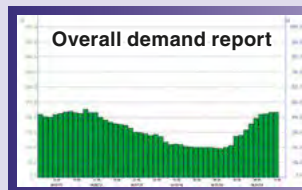
### M50XWTU



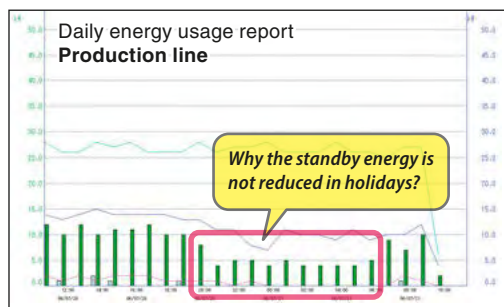
## Detailed Monitoring of Energy Usage to Calculate Carbon Footprint of Products



Many buildings and industrial installations still use only their monthly energy bills to grasp energy consumption of the entire facilities. Energy saving program starts with a visualization of detailed energy usage of each plant or equipment, which can be used to pinpoint the locations where energy is wasted. A simple power monitoring system built with a minimum time and cost is effective for the energy usage visualization.

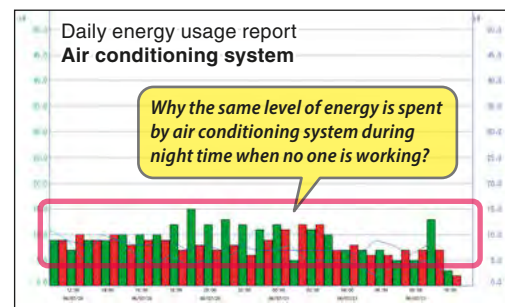


### Improving Production Line Operation



1. Reviewing the operation cycle of reflow furnaces to balance productivity and energy consumption
2. Analyzing the manufacturing process in details to pinpoint the wasted standby energy

### Managing Air Conditioning System



1. Reviewing and resetting room temperature setting
2. Introducing automatic air conditioner operation schedule
3. Thorough employee education to turn off the air conditioner in locker rooms and meeting rooms when they are vacant

## M5X Series Multi Power Transducers

- Only 41 mm (1.61 in) deep, terminal block style modules
- Clamp-on current sensor input up to 600 A
- Up to 31st harmonic distortion measurement (M5XWTU)
- Analog or pulse output option (M5XWTU)
- Basic model M5XWT without harmonic distortion measurement



M5XWT(U)

Modbus

## CLSE Clamp-on Current Sensor

- Easy-to-install, spring-loaded, clamp-on type current sensor
- 5 A, 50 A, 100 A, 200 A, 400 A, 600 A



CE

## 53U / 54U Series Multi Power Monitors

- Single-phase 2-wire and 3-wire, three-phase 3-wire and 4-wire systems
- Various network communication and Ao/Do combinations selectable
- Up to 31st harmonic distortion measurement
- IP50 front panel (53U, 54U)



L53U: DIN rail mounted

CE Modbus

IP50



53U: 1/4 DIN (96-mm sq.) panel size

CE CULUS Modbus

IP50



54U: 110-mm sq. panel size

Modbus CC-Link LONWORKS

## R7 Series Remote I/O

- Clamp-on current sensor use: easy installation
- 2-system input

CC-Link Modbus  
Modbus/TCP LONWORKS



## R3 Series Remote I/O

- 4-point totalized pulse input module for pulse pickups
- Other heavy current system input modules: AC voltage/current, zero-phase current, wattage
- Temperature, DC and other sensor signal inputs are also available.

CC-Link CC-Link IE field  
DeviceNet Modbus Modbus/TCP  
EtherNet/IP LONWORKS  
MECHATROLINK MECHATROLINK-III EtherCAT  
FL-net TLink



## R9 Series Remote I/O

- Clamp-on current sensor use: easy installation
- Up to 8-system input
- Time stamped data logging in SD card

CC-Link Modbus  
Modbus/TCP LONWORKS



## LSMT4 Multi Power Transducer

- Measuring AC current, voltage, active/reactive/apparent power and power factor
- 10 x DC voltage/mA outputs plus 2 x Do

CE



## LT-UNIT Series Power Transducers

- True RMS sensing
- M4 screw terminals
- Max. 550 Vac input
- Conforming to IEC 60688

CE



Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

About Us & Locations

# INDICATORS & TOWER LIGHTS

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

About Us & Locations

## Digital Panel Meters

### Bright, Colorful LED

#### 47L Series

- 1/8 DIN size (96 x 48 mm)
- Red, Orange, Green, Bluegreen, Blue and White LED selectable
- 4 or 4 1/2 digit display
- Alarm and/or transmitter output optional
- IP66 front panel
- Separable terminal block



IP66



Red



Orange



Green



Bluegreen



Blue



White

### High Performance LCD Display

#### 47D Series

- 1/8 DIN size (96 x 48 mm)
- 5 1/2 digit display plus small 20 segment bargraph
- Main display color can be changed from green to red in alarm.
- Alarm and/or transmitter output optional
- 12 V or 24 Vdc sensor excitation
- RS-485 Modbus-RTU interface optional
- IP66 front panel
- Separable terminal block



IP66



Bargraph



Sub display

### Large 0.8" High LED Display

#### 40 Series

- 1/8 DIN size (96 x 48 mm)
- 3 1/2 or 4 digit display
- Display hold function



### 1/32 DIN Size Meters

#### 43 Series

- 1/32 DIN size (48 x 24 mm)
- Easy-to-wire tension clamp connecting
- 24 Vdc powered or loop powered (no external power supply required)
- 43E Series with alarm output



### Ultra-slim Housing with Flat Rear Surface

#### 47NL Series

- 1/8 DIN size (96 x 48 mm)
- Large 16 mm-high, 4 or 4 1/2 digit display: Bright and colorful
- Mountable on standard 30 mm round panel cutout
- Tension-clamp or screw terminal block for electrical connection
- IP66 (except for magnet mounting)
- Moving average function to suppress display flickering
- High/low alarm trips

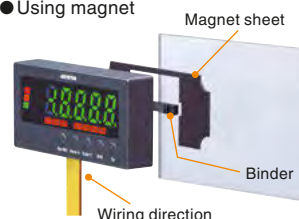


IP66

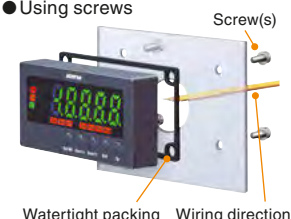


#### Mounting of Tension-clamp Terminal Block Type

● Using magnet



● Using screws



# Digital Panel Meters Selection Guide

APPLICATION	47NL	47L	47D	40	43
DC input, input loop powered	47NLN, 47NLNT	---	---	40DN	43AL1
DC input	47NLV, 47NLVT	47LYV, 47LV	47DV	40LV, 40DV1	43DV2, 43EV
Thermocouple input	---	47LT	47DT	40DT	---
RTD input	47NLR, 47NLRT	47LR	47DR	40DR	---
Potentiometer input	---	47LM	47DM	---	---
2-wire transmitter input (with excitation)	47NLDY, 47NLDYT	---	---	---	43EDY
Strain gauge input	---	47LLC	---	---	---
AC current / voltage input	---	47LAC	47DAC	---	---
PT input	---	47LPT	---	40DPT	---
CT input	---	47LCT	---	40DCT	---
Frequency input (AC line voltage)	---	47LHZ	---	---	---
Frequency input	---	47LPA	---	---	---
Pulse input totalizer (6 digits)	---	47LPQ	---	---	---

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

## Bargraph Indicators

### 48N Series Bargraph Indicators

- 9/64 DIN size (36 x 144 mm)
- 101-segment, 3 mm wide LED
- Red, amber, green and blue colors
- Alarm and/or transmitter output optional
- Vertical or horizontal mounting
- Custom scale with no extra cost
- IP65 front panel
- Separable terminal block



**48NV**  
• Single or dual bars



**48NAV**  
• Single bar  
• Dual/quad alarm



**48NDV**  
• Single bar  
• Dual/quad alarm  
• 4-digit digital display

### 48SV2 Bargraph Indicator

- 18 x 72 mm size
- 51-segment LED
- Red, amber, green and blue colors
- Vertical or horizontal mounting
- Custom scale with no extra cost
- Zero & span adjustments at the front panel
- Separable terminal block optional



**48SV2**



APPLICATION	48NV	48NA	48ND
DC input, single channel	48NV-1	48NAV	48NDV
DC input, dual channel	48NV-2	---	---
DC input, transmitter output	---	48NAVA	48NDVA
4-20 mA input, excitation supply	---	48NAVD	48NDVD
Thermocouple input	---	48NAT	48NDVT
RTD input	---	48NAR	48NDR
Potentiometer input	---	48NAM	48NDM

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## Field Indicators

### 6DV / 6DV-B Loop Powered Field Indicator

- 4-20 mA input loop powered
- No external power source required
- Scaling & linearization selectable via the front control buttons
- IP66 / IP67 field enclosure, aluminium or stainless steel
- ATEX Zone 0, FM Class I, II, III, Division 1 approvals



**6DV**



**6DV-B**

IP66/IP67





Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

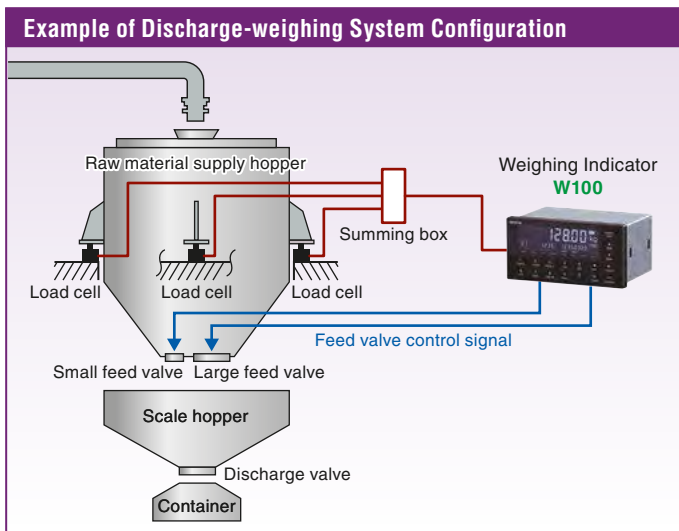
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## W100 Weighing Indicator Automatic Quantitative Feeding Control

The W100 repeats precise and stable measurement of liquid or powder to perform a quantitative feeding control while displaying accurate weight values.

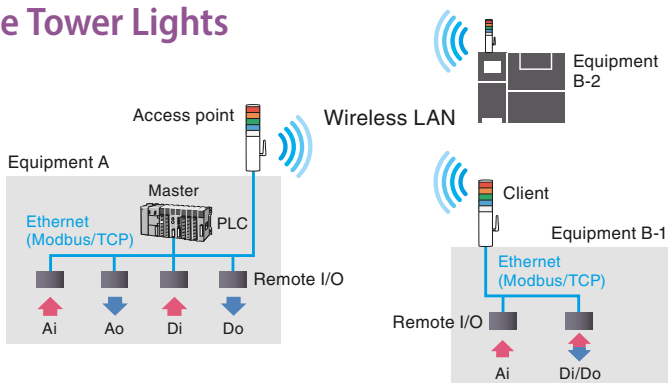


- 72 x 144 mm size
- Highly visible LCD with white characters
- Weighing functions: feeding and discharging
- Control functions: simple comparison or sequence control
- Weighing stability functions: digital low pass filter, moving average, stability detection, stable state filter
- Max. 32 preset values (CODE) can be registered.
- 12-point discrete outputs and 12-point discrete inputs
- IP65 front panel
- Modbus communication



## IT Series Tower Lights Wireless & Open Network Capable Tower Lights

- Energy saving, maintenance free LED lights
- Bright and even illumination
- Direct Modbus/TCP and CC-Link control saves wiring and cost.
- Wireless LAN access point and infrastructure mode (IEEE 802.11b/g/n, 2.4 GHz) certified for use in the EU countries
- Licence-free 900 MHz ISM band, FCC Part 15 compliant wireless module certified for use in the US



LED DIAMETER	WIRELESS LAN		900 MHz ISM BAND		OPEN NETWORK		DISCRETE INPUT		
	Bridge	Access point	Parent	Child	Modbus/TCP	CC-Link	Tall	Short	Pole mounting
40 mm	IT40SW1	IT40SW2	IT40SW5F	IT40SW6F	IT40SRE	IT40SRC	IT40SA1	IT40SA2	IT40SA3
50 mm	IT50SW1	IT50SW2	IT50SW5F	IT50SW6F	IT50SRE	IT50SRC	IT50SA1	IT50SA2	IT50SA3
60 mm	IT60SW1	IT60SW2	IT60SW5F	IT60SW6F	IT60SRE	IT60SRC	IT60SA1	IT60SA2	IT60SA3

# REMOTE I/O

The flexibility and scalability of our Remote I/O supports future system upgrades with full isolation between power-communication-I/O and between analog channels. Economical non-isolated analog modules are also selectable.

Applications include: signal concentrator, data collection in flow and level monitoring, injection molding monitoring and control, test stands and prototyping, glass furnace temperature control, pharmaceutical processes, semiconductor manufacturing equipment, assembly line discrete ON/OFF, and IoT equipment.



**Scalable I/O**  
with free combination of I/O, network and power supply

**Remote I/O**

**All-in-One I/O**  
with I/O, network and power supply in single package

**LARGE NUMBER OF I/O POINTS**


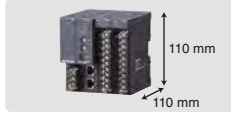
Multi-channel, Scalable Remote I/O

R3 Series

Hot Swappable Modules



Compact, Scalable Remote I/O

R30 Series

Compact size

Slice Type, Scalable Remote I/O






R8/R80 Series

Flexible Configuration without Base

**SMALL NUMBER OF I/O POINTS**

Ultra-Slim, Scalable Remote I/O






R6 Series

Only 78 mm wide with 8 I/O modules

**LARGE NUMBER OF I/O POINTS**

Compact, Multi-point Remote I/O






R1 Series

12-point Universal Input Module

**SMALL NUMBER OF I/O POINTS**



Expandable, Compact Remote I/O

R7 Series

Attached with Discrete I/O Extension Module

Plug-in Remote I/O

R10 Series

Base Socket Mounted Module

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

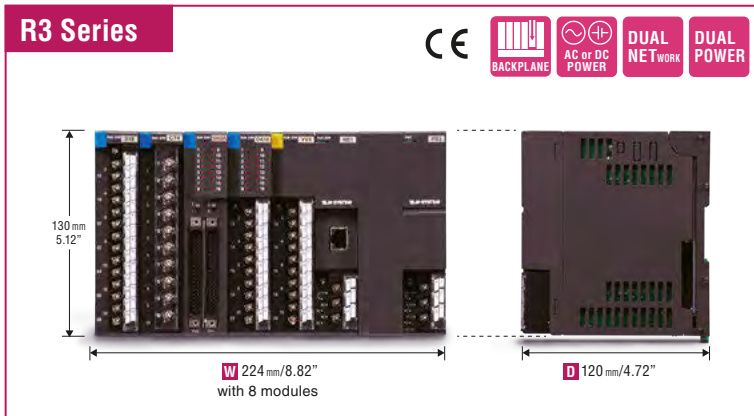
Lightning Surge Protectors

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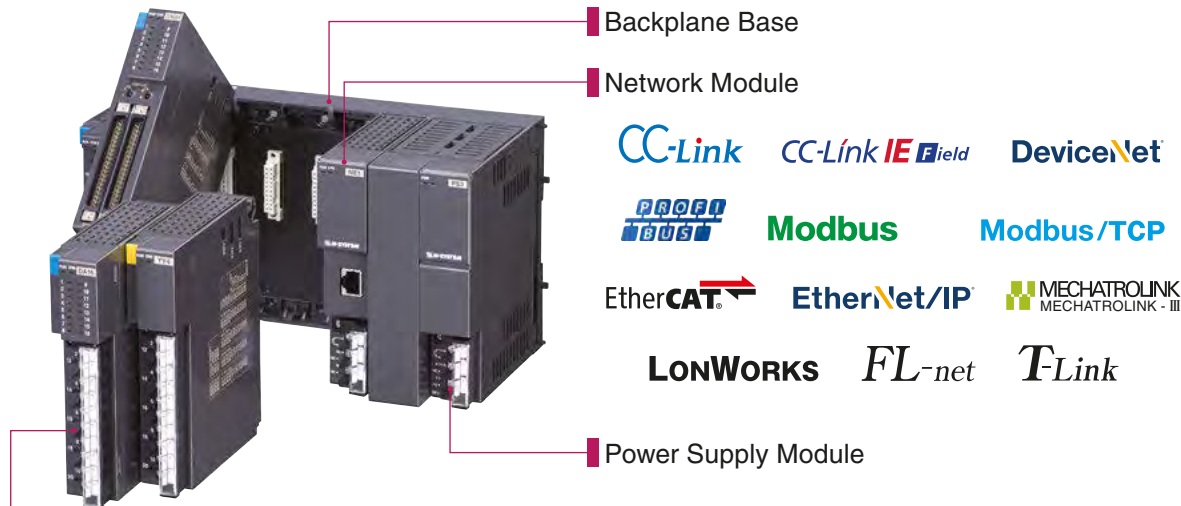
# Multi-channel, Scalable Remote I/O

## R3 Series

- Wide selection of I/O modules including DC, AC, temperature, strain gauge, pulse trains, AC power, etc.
- 4 isolated to 16 non-isolated analog inputs per module
- Max. 64 discrete I/O per module
- Selections of AC power, CT and VT modules suitable for energy monitoring applications
- Dual redundant communication networks and power supplies



## Free Combinations of Network and I/O Modules on Backplane Base



### I/O Module

- DC input module ..... 24 models
- Sensor input module ..... 19 models
- AC power input module ..... 16 models
- Analog output module ..... 7 models
- Pulse I/O module ..... 13 models
- Alarm module ..... 7 models
- Discrete I/O module ..... 28 models
- BCD I/O module ..... 2 models
- Function module for air conditioning ..... 2 models
- Temperature control module ..... 1 model

### Three Types of I/O Connections



**R3 Series**  
M3 screws  
M3.5 screws

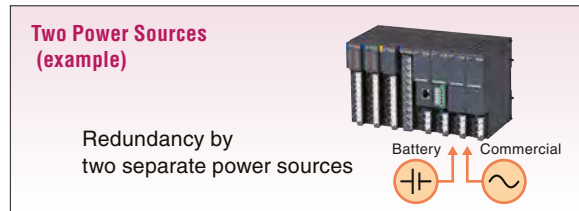
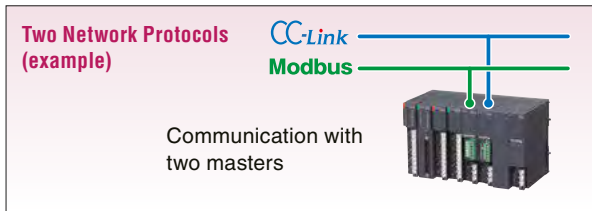
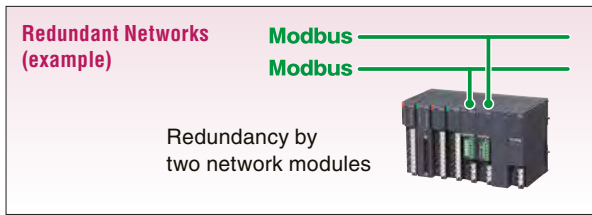


**R3S Series**  
Tension-clamp  
terminal



**R3Y Series**  
FCN connector

## Dual Communication Networks and Power Supplies



Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

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Lightning Surge Protectors

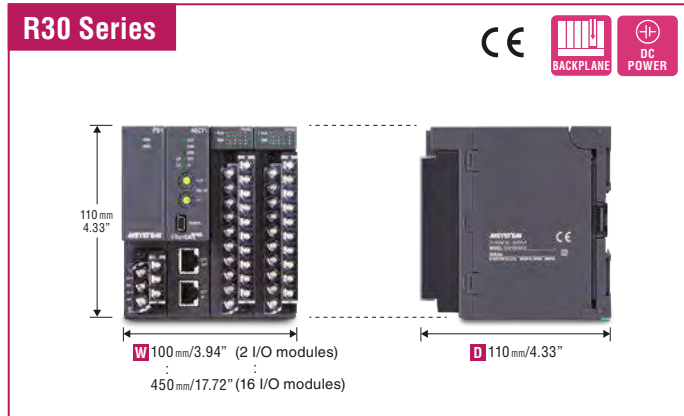
## Compact, Scalable Remote I/O

### R30 Series

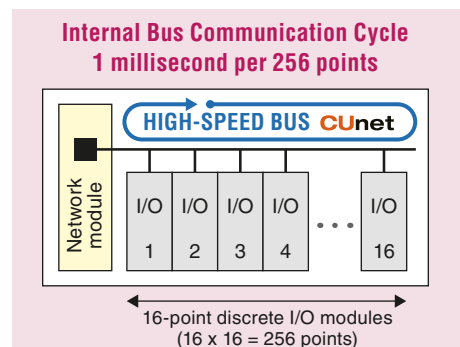
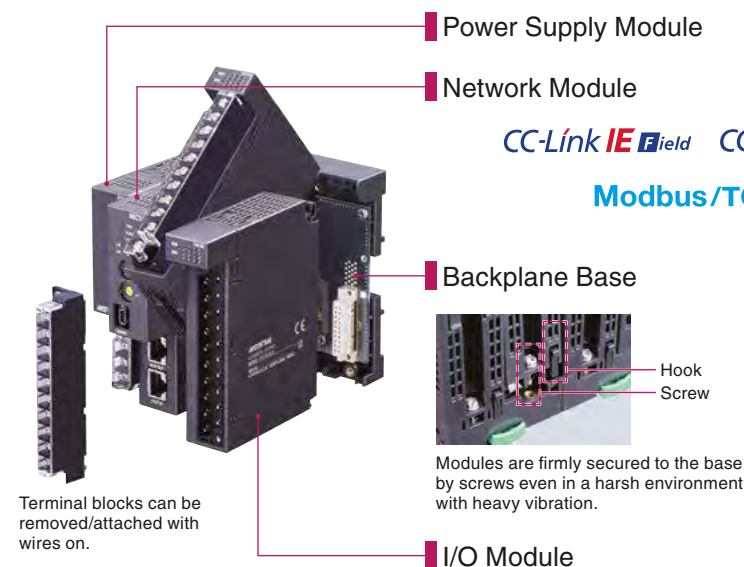
- Ethernet based network protocols
- High-speed internal bus
- 2 or 4 fully-isolated analog I/O per module
- 16 discrete I/O per module
- R3 Series I/O modules can be added by using special connecting base.



R30 Series + R3 Series I/O modules



## Free Combinations of Network and I/O Modules on Backplane Base



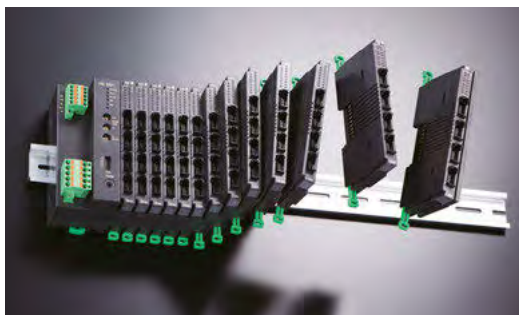
About Us & Locations





# Slice Type, Scalable Remote I/O

## R8 / R80 Series

- Slice type modules can be freely added by necessary number of I/O points, saving installation space to the minimum.
- Only 55 mm (2.17 in) deep modules (except connector)
- Interlock and other special function modules requested for semiconductor manufacturing equipment



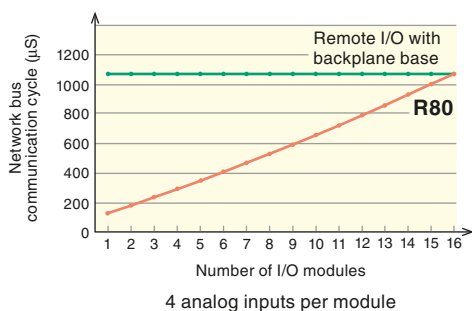
**R8 Series** CE  



X : Calculate by number of 12-mm and 24-mm wide modules (max. 16)

**R8 Series Networks**

CC-Link    DeviceNet    Modbus  
EtherCAT     EtherNet/IP 

## R80 Series Realizes High-speed Internal Bus Communication



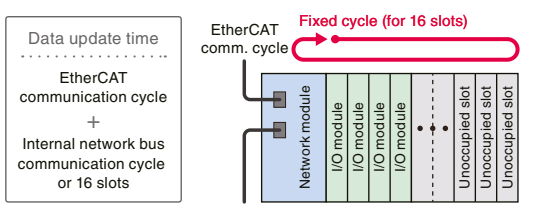
**R80 Series** CE  

X : Calculate by number of 12-mm and 24-mm wide modules (max. 16)

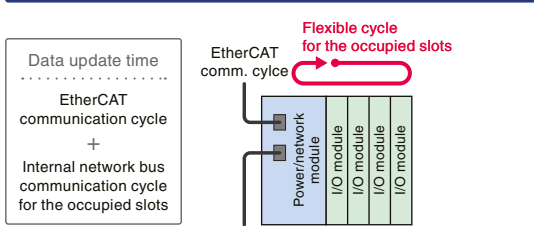
**R80 Series Networks**

CC-Link **IETSN**    DeviceNet    EtherCAT 

**Bus communication cycle: backplane base**



**Bus communication cycle: slice type I/O**



**I/O Connection Types**

**R8 Series**  
Mini-clamp (e-con) connector

**R80 Series**  
Tension-clamp terminal block

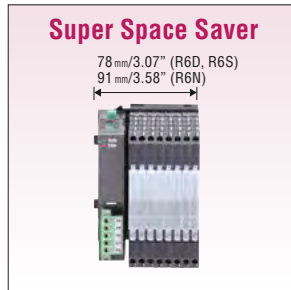
MIL connector  
Tension-clamp terminal block

# Ultra-slim, Scalable Remote I/O

## R6 Series



CE



- Only 78 mm (3.07 in) wide with the minimum system of 8 modules
- Extension by 8 module units — Max. 31 I/O modules
- 2 fully-isolated analog I/O per module
- 4-point discrete I/O per module
- Low power consumption

CC-Link DeviceNet PROFIBUS Modbus Modbus/TCP T-Link

# Compact, Multi-point Remote I/O

## R1 Series

- Economical all-in-one module for Modbus, CC-Link and DeviceNet
- Trigger contact input and alarm contact output
- 12-point universal inputs
- 8- or 16-point TC/DC inputs
- 8-point RTD inputs
- 4-point totalized counter inputs and 8-point contact I/O
- 32-point contact inputs or outputs



CE

CC-Link DeviceNet Modbus

# Expandable, Compact Remote I/O

## R7 Series

- Palm-top size compact module can handle 4 analog input, 2 analog output or 16 discrete signals.
- 8 or 16 discrete input/output module can be attached to the base module.



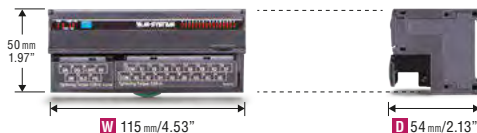
CE cULUS

CC-Link DeviceNet Modbus Modbus/TCP LONWORKS

MECHATROLINK T-Link FLEX NETWORK® HLS Hi-speed Link System

## R7 Series

CE



Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

About Us & Locations

# Compact Remote I/O for FA Control Equipment

## R7 Series



- Compact, terminal block style, all-in-one modules
- 16-point, 32-point or 64-point DI, DO or I/O-mixed modules; analog I/O types are also available.
- Various I/O terminal styles are selectable.

More R7 series products are available for CC-Link, DeviceNet, Modbus/TCP, HLS and MECHATROLINK-I, -II.

CC-Link				CC-Link			
SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS				
R7F4DC		Mini-clamp connector (e-CON)					
		Tension clamp terminal	DI16	DO16	DI 8 DO8		
		One-touch connector					
R7F4HC		FCN connector	DI32	DO32	DI 16 DO16		

DeviceNet				DeviceNet			
SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS				
R7F4DD		Tension clamp terminal	DI16	DO16	DI 8 DO8		
		Mini-clamp connector (e-CON)					
R7F4HD		MIL connector	DI32	DO32	DI 16 DO16		

EtherCAT				EtherCAT			
SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS				
R7I4DECT		Mini-clamp connector (e-CON)	DI32		DI 16 DO16	AI AO	

Ethernet/IP				Ethernet/IP			
SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS				
R7F4HEIP		Tension clamp terminal	DI16	DO16	DI 8 DO8		
R7G4HEIP		M3 screw terminal	DI16	DO16			


- Four-wire Signal Conditioners
- Two-wire Signal Conditioners
- Power Monitoring Components
- Indicators & Tower Lights

### Remote I/O




- Paperless Recording System
- Process & Temperature Controllers
- IoT Components
- Final Control Components
- Lightning Surge Protectors

### About Us & Locations





**Modbus/TCP** **Modbus/TCP**

SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS			
R7K4FE		M3 screw terminal		D016		

**HLS** **HLS** Hi-speed Link System

SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS			
R7F4DH		Mini-clamp connector (e-CON), MIL connector, Tension clamp terminal	DI16	D016	DI 8 DO8 or DI 16 DO16 (MIL connector)	
R7K4DH		Mini-clamp connector (e-CON)			DI 16 DO16	
R7G4HH		M3 screw terminal				AI AO

**MECHATROLINK-III** **MECHATROLINK** MECHATROLINK - III

SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS			
R7K4FML3		M3 screw terminal	DI32	D032	DI 16 DO16	
R7K4JML3		Tension clamp terminal			DI 32 DO32	
R7G4FML3		M3 screw terminal or Mini-clamp connector (e-CON)	DI16	D016		
R7F4HML3		MIL connector			DI 16 DO16	
R7G4HML3		M3 screw terminal				AI AO

**MECHATROLINK-I, -II** **MECHATROLINK** MECHATROLINK - I, -II

SERIES	EXTERNAL VIEW	I/O TERMINAL STYLE	I/O VARIATIONS, NUMBER OF CHANNELS			
R7K4FML		M3 screw terminal	DI32	D032	DI 16 DO16	
R7K4DML		Mini-clamp connector (e-CON)	DI32		DI 16 DO16	
R7G4HML		M3 screw terminal				AI AO

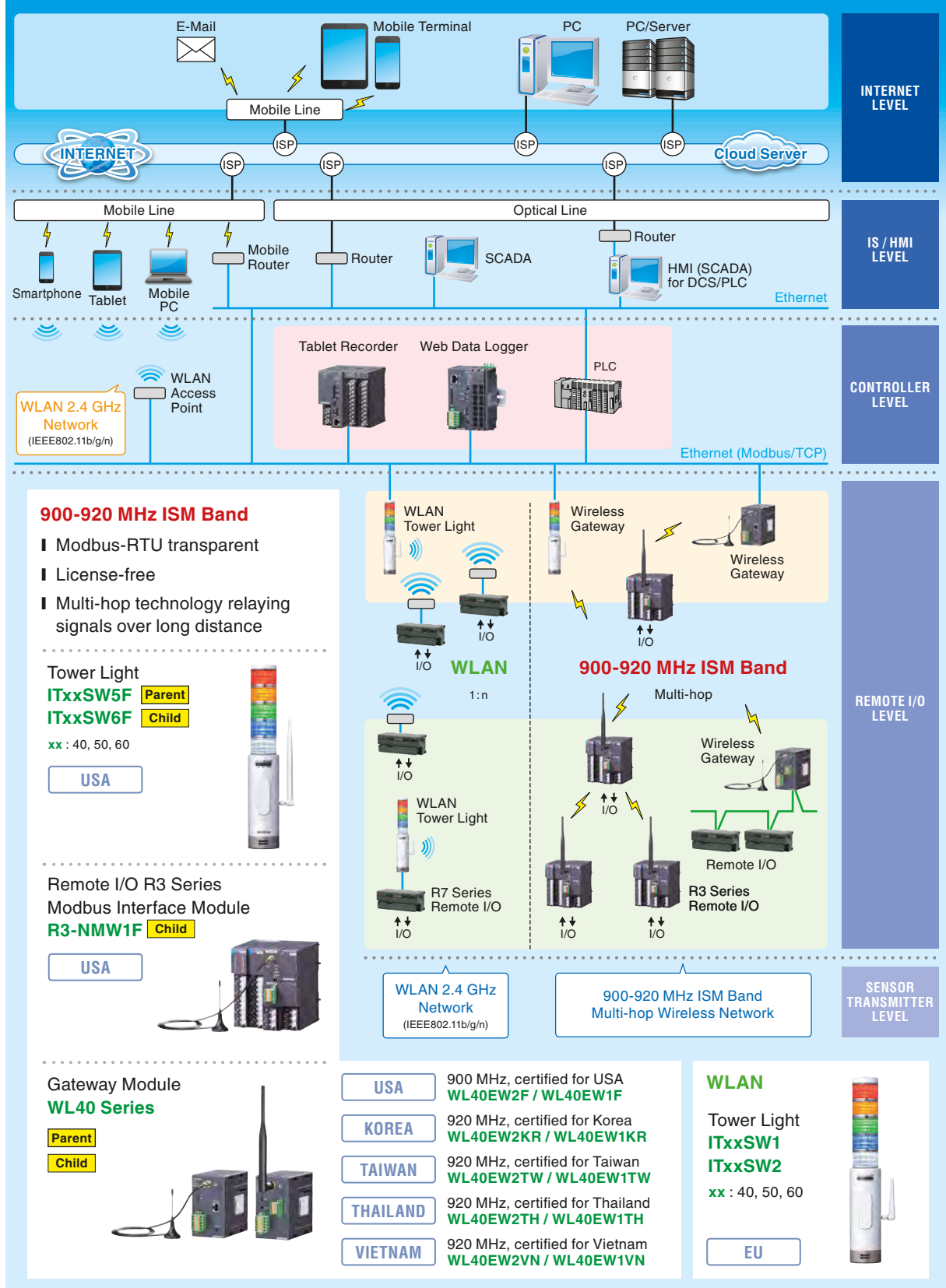
- Four-wire Signal Conditioners
- Two-wire Signal Conditioners
- Power Monitoring Components
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- Paperless Recording System
- Process & Temperature Controllers
- IoT Components
- Final Control Components
- Lightning Surge Protectors
- About Us & Locations



# Wireless I/O System for IoT

- Convenient wireless converters/gateways to collect field sensor data
- Remote monitoring using your mobile terminals via the internet

Use of wireless products is restricted by national radio regulations of individual countries. Please consult us for the details of certified products.



## 900-920 MHz ISM Band

- Modbus-RTU transparent
- License-free
- Multi-hop technology relaying signals over long distance

### Tower Light

ITxxSW5F **Parent**  
ITxxSW6F **Child**

xx : 40, 50, 60

USA



### Remote I/O R3 Series Modbus Interface Module

R3-NMW1F **Child**

USA



### Gateway Module WL40 Series

**Parent**  
**Child**



USA

900 MHz, certified for USA  
WL40EW2F / WL40EW1F

KOREA

920 MHz, certified for Korea  
WL40EW2KR / WL40EW1KR

TAIWAN

920 MHz, certified for Taiwan  
WL40EW2TW / WL40EW1TW

THAILAND

920 MHz, certified for Thailand  
WL40EW2TH / WL40EW1TH

VIETNAM

920 MHz, certified for Vietnam  
WL40EW2VN / WL40EW1VN

## WLAN

Tower Light  
ITxxSW1  
ITxxSW2  
xx : 40, 50, 60

EU



Four-wire Signal Conditioners

Two-wire Signal Conditioners

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Paperless Recording System

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Lightning Surge Protectors

About Us & Locations

# Components for Building Automation

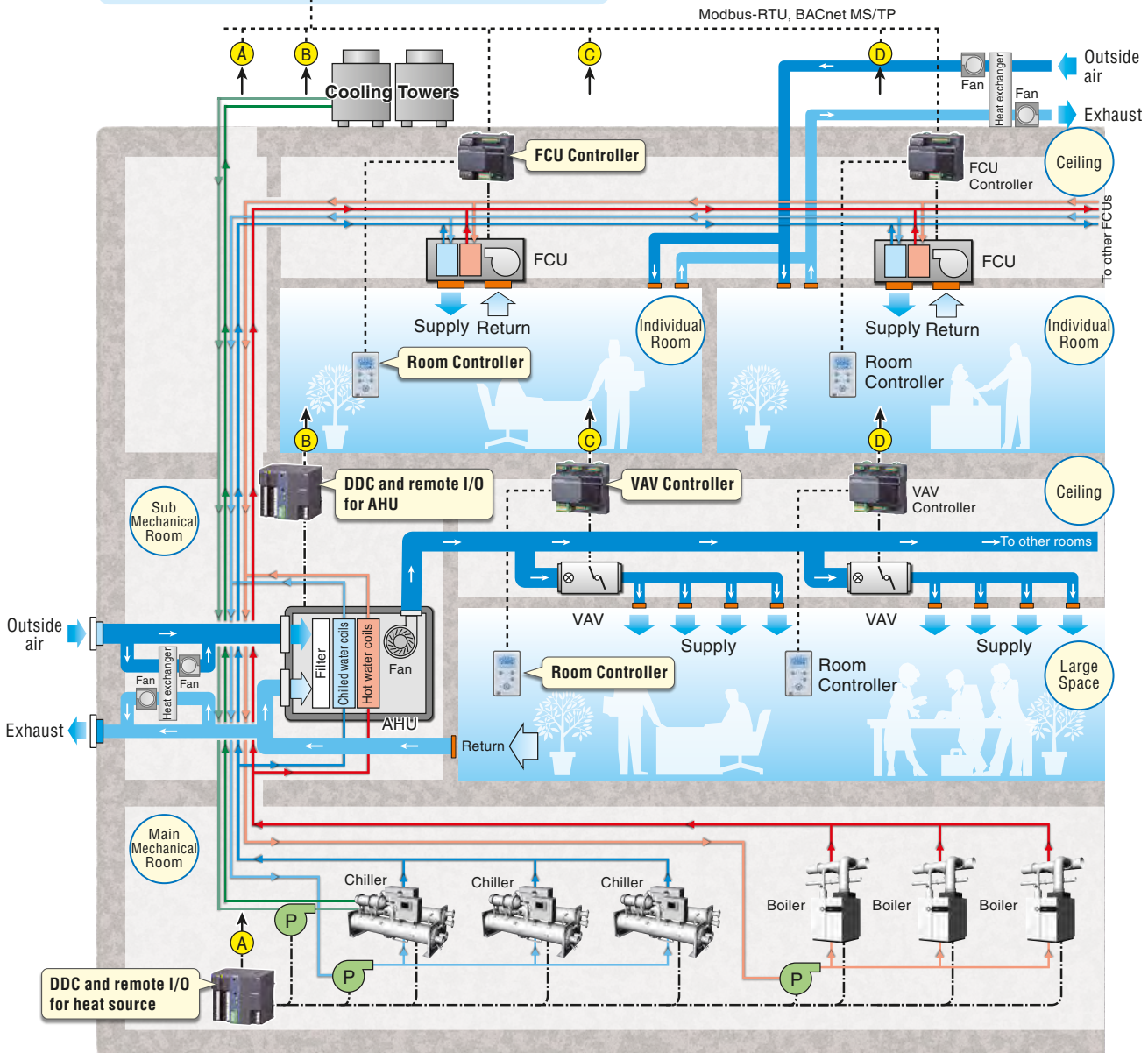
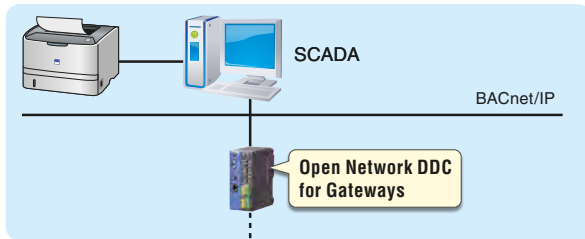
The central HVAC (Heating, Ventilation and Air Conditioning) control system is an air-conditioning system, in which a heat source system, including boilers, chillers, and conveying pumps concentrated in one place, produces and sends chilled water, hot water, or steam to the heat exchangers, e.g. air handling units (AHUs) and fan coil units (FCUs) on each floor, thus performing the cooling or heating of the entire building. We developed Direct Digital Controller (DDC) and remote I/O modules specialized for building automation.

**Some products are only available in Japanese market. Please consult us for further information.**



Glossary	
AHU	: Air Handling Unit (i.e. air conditioner)
VAV	: Variable Air Volume (variable air volume unit)
FCU	: Fan Coil Unit
DDC	: Direct Digital Controller

Legend	
—	BACnet/IP
- - - -	Modbus-RTU and BACnet MS/TP
- - - -	Individual wiring
— (blue)	Chilled water supply pipe
— (light blue)	Chilled water return pipe
— (orange)	Hot water supply pipe
— (red)	Hot water return pipe
— (green)	Cooling water supply pipe
— (dark green)	Cooling water return pipe



Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

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# PAPERLESS RECORDING SYSTEM

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

About Us & Locations

## TR30-G Tablet Recorder Web-enabled DAQ System

- Compact package
- No need of dedicated application software other than a web browser
- Flexible built-in I/O modules plus extended Modbus slave I/O
- Large main memory plus auxiliary SD card
- Regular and event e-mailing
- FTP server and client
- Modbus/TCP master and slave
- SNMP client
- User's original browser view



H 110 mm  
4.33"

D 98 mm  
3.86"

Model TR30-G is a web-based data acquisition system enabling users to view and access stored data via an internet browser. Freed from a dedicated display screen, accessibility and portability of the data is greatly enhanced.

In addition, users can receive free benefit of ever-evolving state-of-the-art user interface and apps provided by tablet terminals: i.g. ultrahigh resolution screen, intuitive touch panel operations, entering comments by dictation or hand-writing, capturing a screen shot and e-mailing, etc.

At the maximum of 64 analog inputs (16-bit data), 64 discrete inputs, 64 discrete outputs, 32 pulse inputs (32-bit data) plus 32 function inputs (mathematical, logic, filter, etc.) are usable. At the maximum of 120 channels can be plotted on the charts and stored at the storing cycle of 1 minute. The fastest storing cycle is 5 milliseconds for 16 channels, 100 milliseconds for 32 channels.

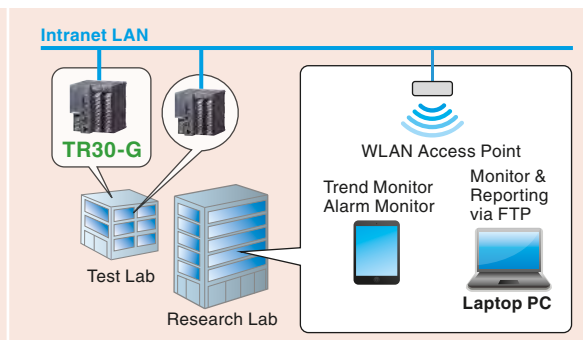
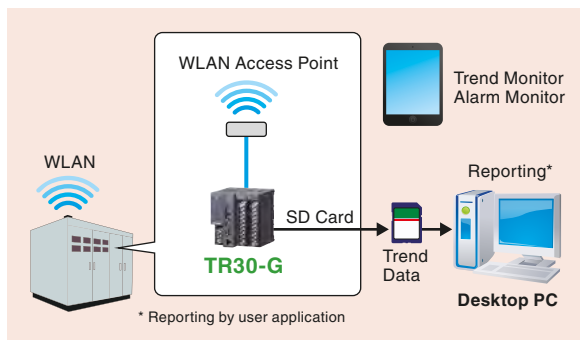
### Freedom from dedicated display screen — Enhanced data accessibility and portability

#### PLANT FIELD MAINTENANCE

Operators can bring in tablets and smart phones to access trend data while freely walking around the site. Data can be transferred to PC via FTP or via SD card.

#### TEST AND RESEARCH

Researchers can access data logged at a test lab in a remote building while working in their own office.





## Browser Views



Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

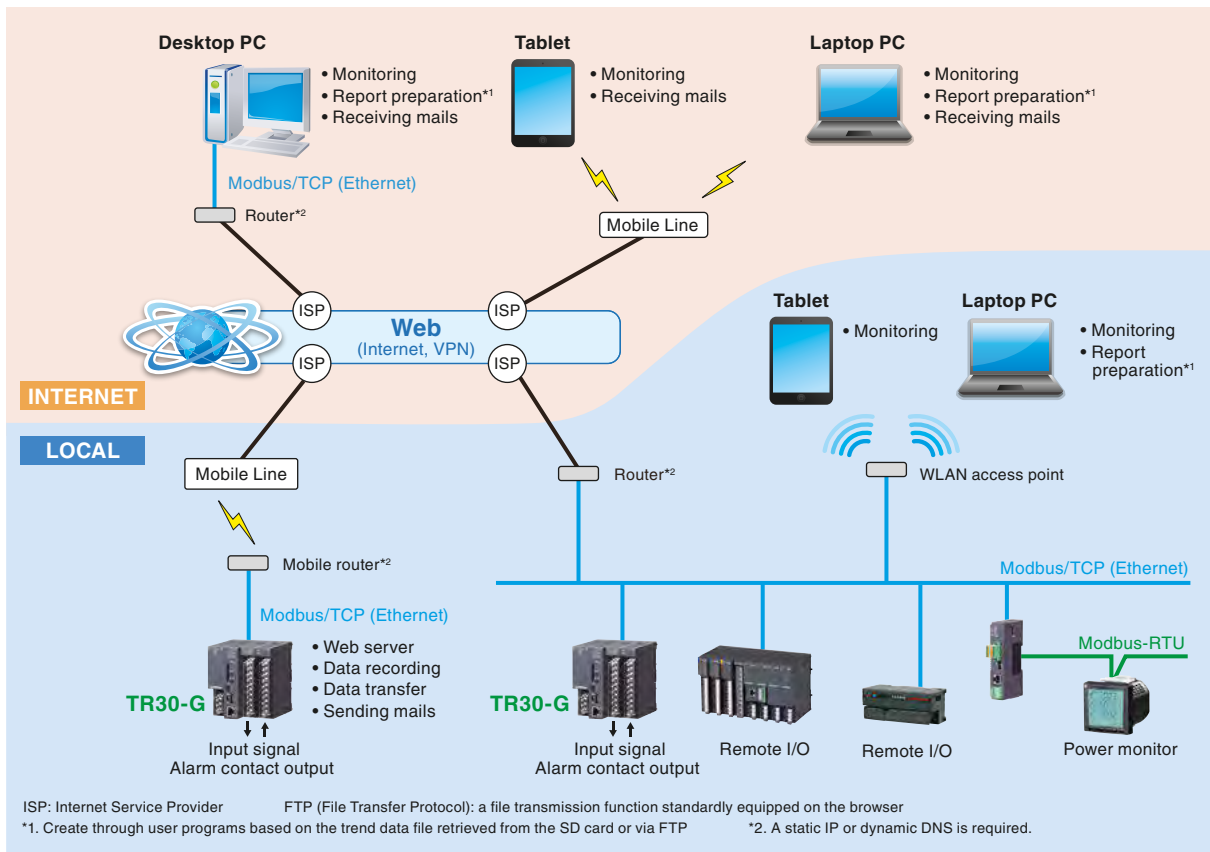
Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

## System Configuration



About Us & Locations



## 73VR Series Paperless Recorder

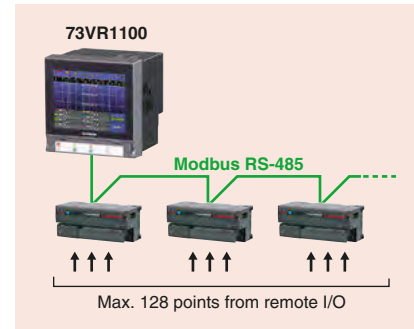
- Touch panel operated 5.5 inch TFT color LCD display
- 144 mm square DIN standard panel size
- Data can be transferred in real time to the host PC via Ethernet, viewed and stored on the MSR128 PC Recorder program.

IP65



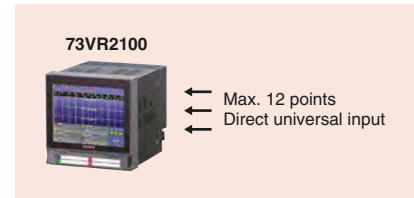
### Remote I/O Acquisition: 73VR1100

- Recording up to 128-point data transmitted from independent I/O located remotely in the field, or inside an instrumentation or control cabinet
- Instead of using expensive sensor cables, reduce wiring runs by using field networks.
- I/O separated 73VR1100 provides an installation flexibility, fitting in the tight space of a control panel or machinery chassis.



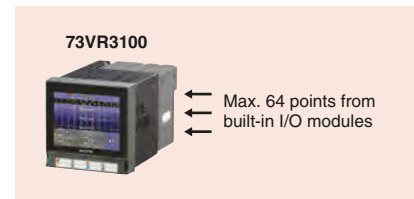
### Built-in Universal Input: 73VR2100

- DC current/voltage, thermocouple and RTD inputs from 2 to 12 points
- Independent input type and range selectable for each channel
- 100 msec. storing rate up to 6 points



### Selectable I/O Modules: 73VR3100

- Up to four R3 Series I/O modules (max. 64 points) can be selected and mounted at the rear of the recorder.
- Compatible with various open networks to communicate with major PLC: the 73VR3100 used as remote I/O with local display and recorder, integrated in a PLC control system
- 20 msec. storing rate with the combination of 8 analog and 8 discrete inputs



## 71VR1 Compact Paperless Recorder

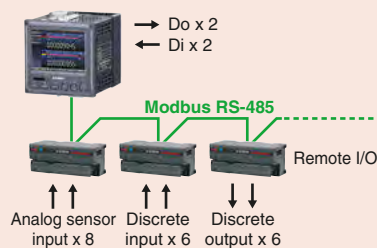
- 1/4 DIN size (96 x 96 mm) panel mount compact recorder
- 3.5 inch TFT color LCD display
- Max. 8-point each of analog and discrete inputs are stored, displayed and alerted.
- Max. 8-point discrete outputs can be assigned to alarm trips.
- Direct field inputs at the built-in terminals and optional remote inputs via Modbus RTU



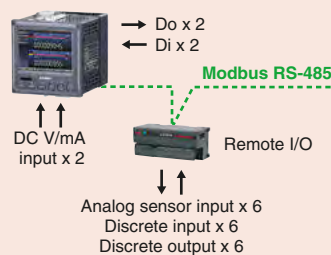
CE

IP65

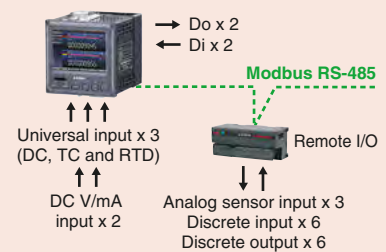
### Remote I/O Type 71VR1-E001



### DC Input Type 71VR1-E101



### Universal Input Type 71VR1-E501



# PROCESS & TEMPERATURE CONTROLLERS

## SC100/SC200 Series Multi-Function PID Controller

- Two loops of PID control
- 2 x universal inputs, 4 x analog inputs, 5 x contact or pulse inputs, 1 x high speed pulse input
- DCS in instrument format: 2 PID blocks, 48 computation blocks and 12 sequential control blocks; Expansion model with doubled computation blocks are also available.
- Auto tuning function
- Ideal for replacing existing instruments
- High reliability for demanding process use — Built-in manual loader with enhanced security features
- Host communication via Modbus Ethernet TCP/IP or RS-485 RTU
- Peer-to-peer communication via NestBus to expand number of I/Os



CE  
IP55

FUNCTION	MODEL
Basic version	SC100
Modbus/Nestbus extension	SC200 SC200W
Basic version with manual loader	SC110
Modbus/Nestbus extension with manual loader	SC210 SC210W
Pulse width output	SC200D

## Highly Visible Color Graphic LCD Intuitive Touch Panel Operation

**OPERATION VIEWS**

**ENGINEERING VIEWS**

## TC10 Series Temperature Controller

- Universal input configurable to T/C, RTD, DC current or voltage independently
- Discrete input for remote trigger
- Clamp-on current sensor input to detect wire breakdown or overload
- Modbus-RTU slave



TC10NM  
• 1/8 DIN size  
• One PID loop

CE  
IP65



TC10EM  
• 1/4 DIN size  
• Two PID loops

CE  
IP65

Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

Indicators & Tower Lights

Remote I/O

Paperless Recording System

Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

About Us & Locations



## Extensive Functions with Convenient Web Browser Views: No Application Software is Required

### Main Memory Capable of Storing Data for Over 10 Years

The DL30-G can save at the maximum of 128 points of analog/discrete signal data and events in its large main memory. Files are regularly copied to the SD card as backup.

Various arithmetic functions can be applied to I/O measurement values and the results are saved locally.

Data can be uploaded to a host device via FTP (or FTPS).



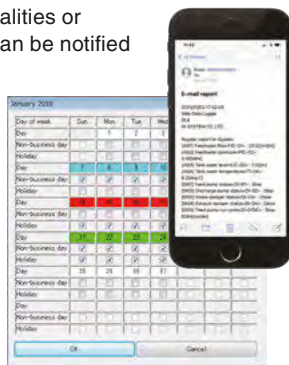
### Event/Regular E-mail Attached with Report Files

Events such as data abnormalities or machine status (Run-Stop) can be notified by e-mails.

Regular data reporting is also possible.

Notification calendar can be customized to suppress mailing on holidays.

Preformatted spreadsheet report files can be attached to mails.

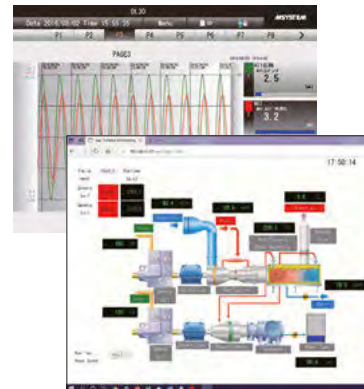


### Web Server for Remote Monitoring

The DL30-G has a web server function equipped with various standard monitoring windows:

- Trend graph
- Data display
- Event log
- Spreadsheet report
- Download

Graphic windows can be created by describing HTML and JavaScript.



### Extensive Communication Control

The DL30-G supports various network protocols including those as master/server station, enabling users to build a local stand-alone data logging and basic edge computing system without needing a host PC.

- HTTP/HTTPS server
- FTP/FTPS client and server
- Modbus/TCP master and slave
- SMTP client
- SNTP client (automatic time adjustment)
- SLMP master

Four-wire Signal Conditioners

Two-wire Signal Conditioners

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Lightning Surge Protectors

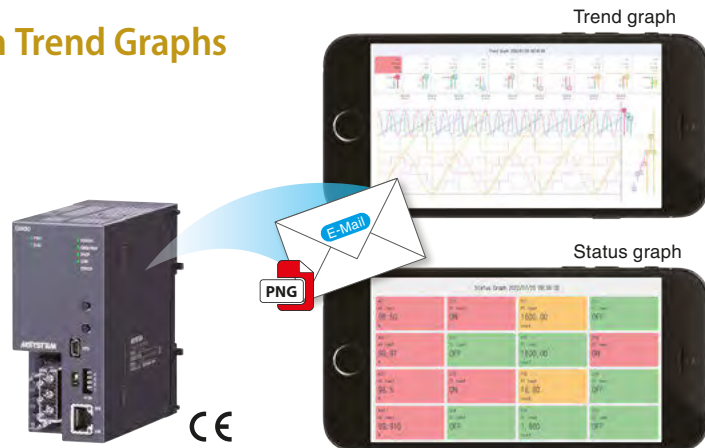
## GM30 Graphical Mailing Unit

### Event Reporting by E-mails with Trend Graphs

The GM30 continuously monitors at the maximum of 32 input devices connected through Ethernet. If an event (abnormality) is detected at one or more input points, it generates trend graph and status graph files in PNG format, sends them to predesignated e-mail recipients.

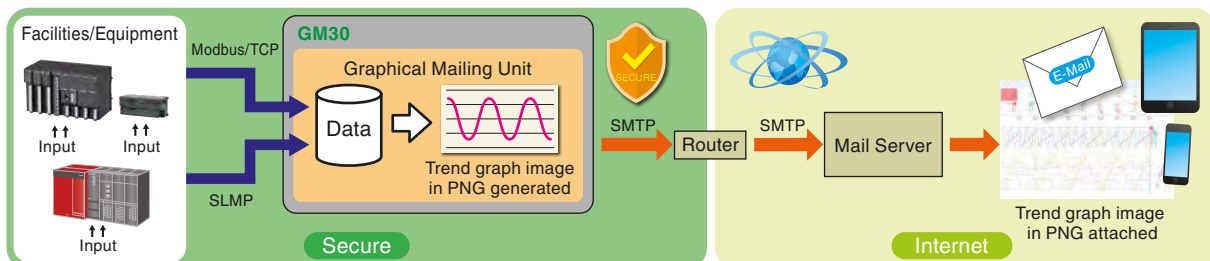
Graphic images help the receivers grasp the event circumstances at a quick glance, and also can be easily shared by others.

Universal format files can be archived for future reference in picture albums readily available on PCs.



About Us & Locations

### Facilities/Equipment, with No Direct External Connection, are Safe from Unauthorized Access through Internet





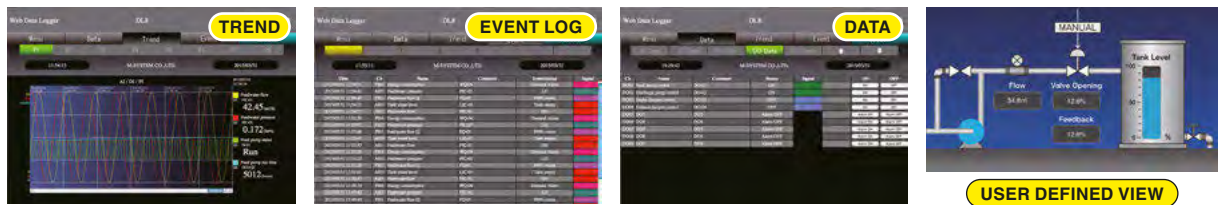
# DL8 Series Web Enabled Remote Terminal Unit

## Use Internet and Your Smartphone to Build Up Remote Monitoring System

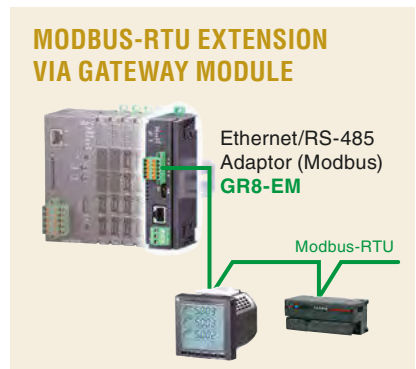
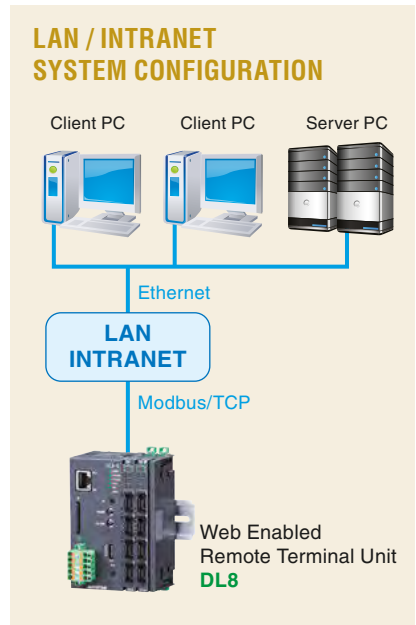
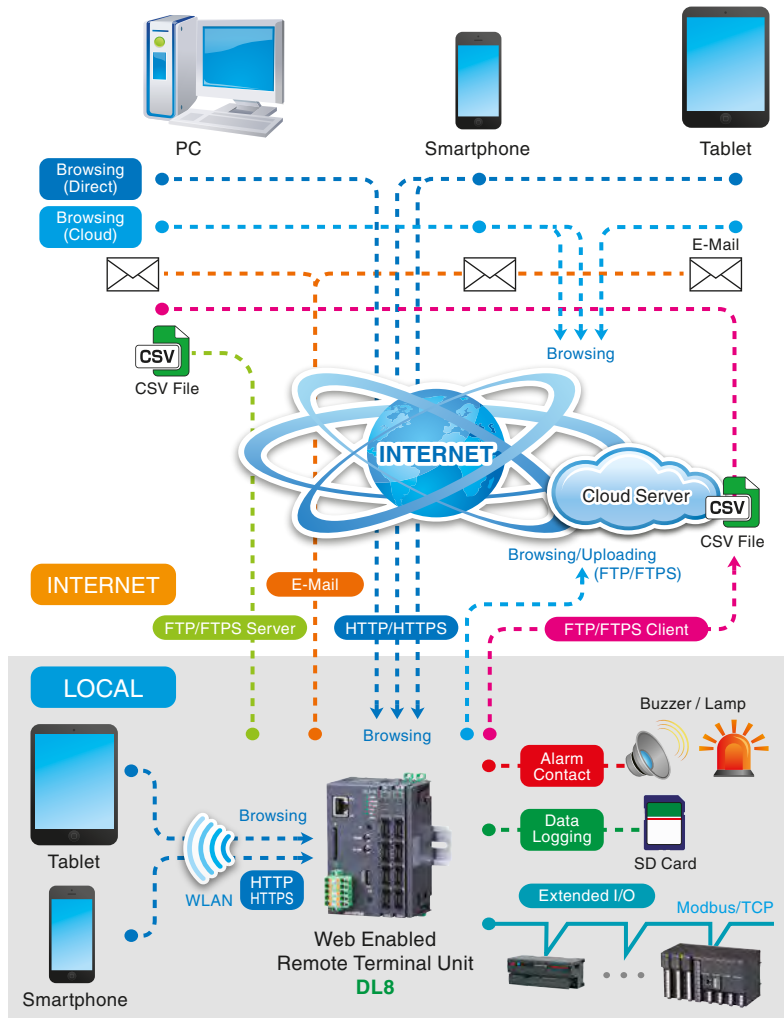
- Simple remote monitoring via the internet without needing to build up a complex PC based system
- Pre-installed user-friendly browser views for remote data access through smartphones or tablets
- Event and regular reporting by e-mails
- Local data stored in an SD card memory
- Various network protocols are usable: TCP/IP, HTTP/HTTPS server, FTP/FTPS client and server, SMTP client, Modbus/TCP master and slave.
- R8 Series remote I/O modules available to accept a wide variety of field signals



### Web Browser Views Designed for Mobiles



### Enhanced Functions with Flexible Configurations



- Four-wire Signal Conditioners
- Two-wire Signal Conditioners
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About Us & Locations

# RGP30 Remote Graphic Panel

## Easy Visualization of Manufacturing Plant Operations

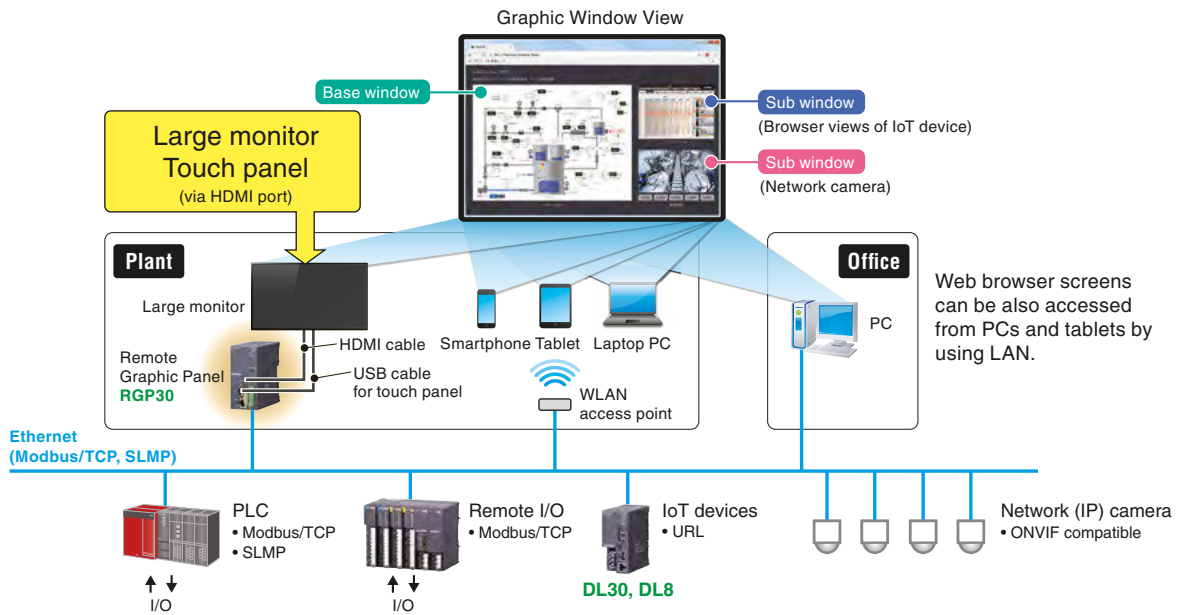
The RGP30 is “a graphic panel without dedicated display” which enables users to freely choose a display device suitable for their applications.

It generates web browser screens showing various kind of data imported from PLCs, remote I/Os, IoT devices and CCTV cameras.

The dedicated graphic designing tool, RGP-Designer, is used to build display panel designs with multiple inline windows and original graphics using graphical parts from the component library.



### Commercially Available Large Displays with Cost Performance Can be Connected through HDMI Port



- Four-wire Signal Conditioners
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# SG6 Security Gateway

## Certification/Encryption Added to Modbus/TCP

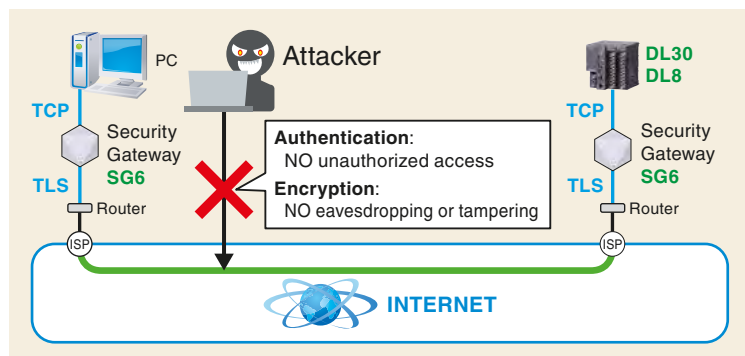
Basic industrial protocols such as Modbus/TCP with no authentication or encryption system, need other means such as VPN (Virtual Private Network) to secure communications via the internet, which may be costly and over performance if it is employed only for Modbus/TCP.



A pair of SG6 placed at the gateway to the internet provide TLS (Transport Layer Security) to common but vulnerable Modbus/TCP, SLMP or HTTP.

Security of a currently running system can be easily upgraded by introducing the SG6.

- Security by encrypted communication and cross certification
- Upgraded security for Modbus/TCP
- Authentication without using login ID/ password
- HTTP server can be operated as HTTPS server.
- Certificates can be generated by using LCA-SG Local Certification Authority Creator.



About Us & Locations

# FINAL CONTROL COMPONENTS

## Linear and Rotary Motion Electric Actuators for Valves and Machinery



Open network interface  
CC-Link DeviceNet



**MSP4**  
CE UK  
IP66

150 N ● 300 N ● 500 N ● 700 N ●  
33.7 lbf 67 lbf 112 lbf 157 lbf

600 N ●  
135 lbf

Open network interface  
CC-Link DeviceNet



**MSP5**  
CE UK  
IP66

150 N ● 300 N ● 500 N ● 700 N ●  
33.7 lbf 67 lbf 112 lbf 157 lbf

Open network interface  
**Modbus**  
Auto-setup function



**MSP40**  
IP66

Open network interface  
**Modbus**  
Auto-setup function



**MSP50**  
IP66

150 N ● 300 N ● 700 N ●  
33.7 lbf 67 lbf 157 lbf

450 N ● 600 N ● 740 N ●  
101 lbf 135 lbf 166 lbf

Thrust

150 N  
33.7 lbf

300 N  
67 lbf

500 N  
112 lbf

700 N  
157 lbf

Torque

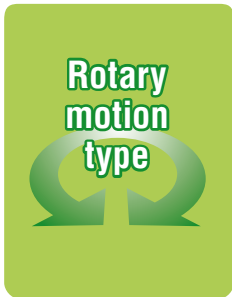
5 N·m  
3.69 lbf-ft

10 N·m  
7.38 lbf-ft

16 N·m  
11.8 lbf-ft

24 N·m  
17.7 lbf-ft

33 N·m  
24.3 lbf-ft



**MRP4** IP66 CE UK  
CA

Open network interface  
CC-Link DeviceNet



5 N·m ●  
3.69 lbf-ft

**MRP5** IP66 CE UK  
CA

Open network interface  
CC-Link DeviceNet



10 N·m ●  
7.38 lbf-ft

**MRP6** IP66 CE UK  
CA

Open network interface  
CC-Link DeviceNet



10 N·m ● 16 N·m ● 24 N·m ● 33 N·m ●  
7.38 lbf-ft 11.8 lbf-ft 17.7 lbf-ft 24.3 lbf-ft

**MRP10** IP66 CE UK  
CA

Open network interface  
**Modbus**  
Terminal box with LED



6 N·m ● 16 N·m ● 35 N·m ●  
4.43 lbf-ft 11.8 lbf-ft 25.8 lbf-ft

Four-wire Signal Conditioners

Two-wire Signal Conditioners

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Open network interface  
**CC-Link**  
**DeviceNet**



**MSP6**  
 CE UK CA  
 IP66

**1200 N** ● 270 lbf  
**1800 N** ● 405 lbf  
**2500 N** ● 562 lbf



**PSN1**  
**PSN1G**  
 CE  
 IP66

PSN1G: 3000 N

**1500 N** ● 337 lbf  
**3000 N** ● 674 lbf



**PSN3**  
 CE  
 IP66

**1500 N** ● 337 lbf  
**3000 N** ● 674 lbf  
**5000 N** ● 1124 lbf

Open network interface  
**Modbus**  
 Auto-setup function  
 Terminal box with LED



**MSP10**  
 CE UK CA  
 IP66

1300 N

● **780 N** 175 N  
**1200 N** ● 270 lbf  
 ● **1400 N** ● 292 lbf  
 ● **1400 N** ● 315 lbf  
**2300 N** ● 517 lbf  
 ● **2500 N** ● 562 lbf

**1200 N** 270 lbf  
**1800 N** 405 lbf  
**2500 N** 562 lbf  
**3000 N** 674 lbf  
**5000 N** 1124 lbf

**70 N·m**  
 51.6 lbf-ft

**100 N·m**  
 73.8 lbf-ft

**200 N·m**  
 148 lbf-ft

**600 N·m**  
 443 lbf-ft

**EAR70**

Reversible AC motor type

IP66 CE



**70 N·m** ●  
 51.6 lbf-ft

IP66 CE **PRP-0**



**100 N·m** ●  
 73.8 lbf-ft

IP66 CE **PRP-1**



**200 N·m** ●  
 148 lbf-ft

IP66 CE **PRP-2**



**600 N·m** ●  
 443 lbf-ft

● **50 N·m**  
 36.9 lbf-ft

Conformance with CE/UKCA depends upon models. Please refer to the data sheets for details.



Four-wire Signal Conditioners

Two-wire Signal Conditioners

Power Monitoring Components

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IoT Components

Final Control Components

Lightning Surge Protectors

## MSP / MRP Series Electric Actuator

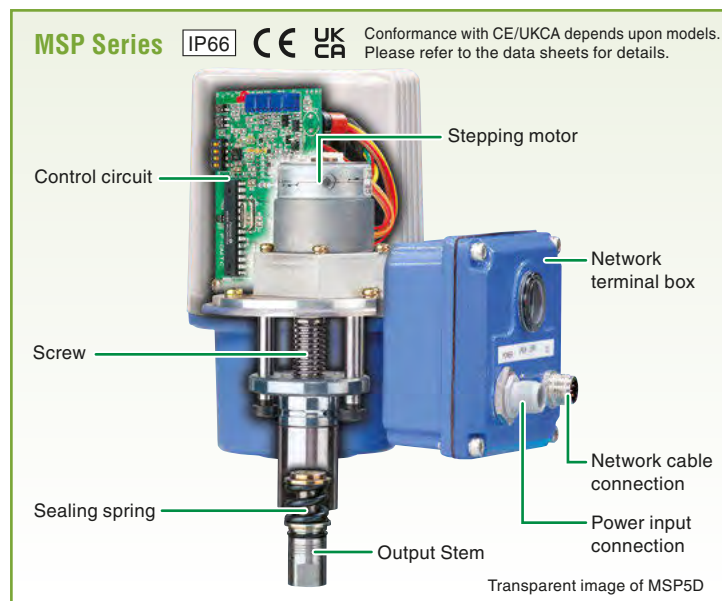
### MSP Series: Linear Motion

- Max. rated thrust: 2500 N (562 lbf)
- Max. stroke: 40 mm (1.57 in)

### MRP Series: Rotary Motion

- Max. rated torque: 33 N·m (24.3 lbf·ft)
- Max. turn: 90°

- High resolution positioning for superior control
- Built-in feedback positioner and electric limiter
- Brushless stepping motor assures long life operation.
- Optional network interface with CC-Link, DeviceNet and Modbus

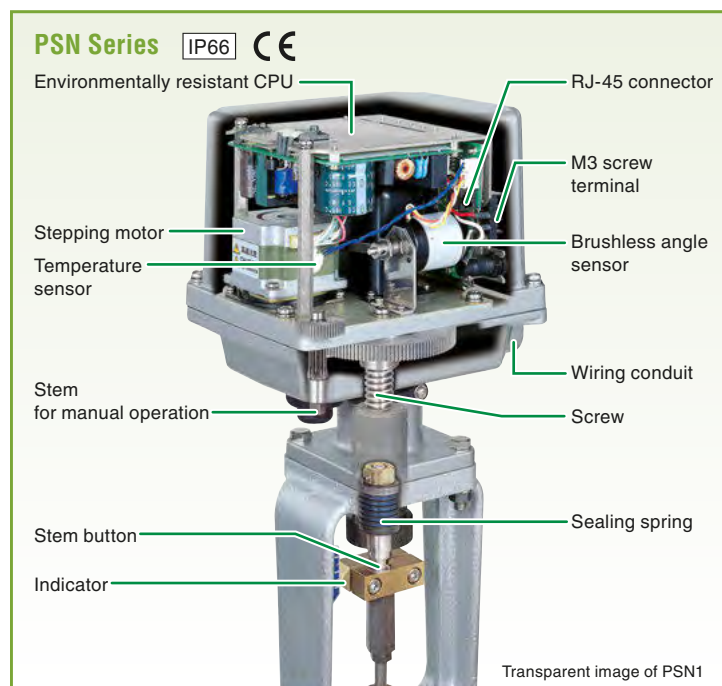


## PSN / PRP Series Electric Actuator

### PSN Series: Linear Motion

- Max. rated thrust: 5000 N (1124 lbf)
- Max. stroke: 60 mm (2.36 in)

- Brushless angle sensor eliminates problems with mechanical potentiometer feedback sensing
- Opening/closing speed, split range and failsafe position programmable by hand-held programmer
- Internal temperature sensor to control heater in cold climate and to prevent motor from overheating
- Forced-open/-closed contacts for remote or manual override



### PRP-0, -1: Rotary Motion

- Max. rated torque: 200 N·m (148 lbf·ft)
- Max. turn: 90°



Lloyd's Register approved type available (ENV3)



IP66 CE

### PRP-2: Rotary Motion

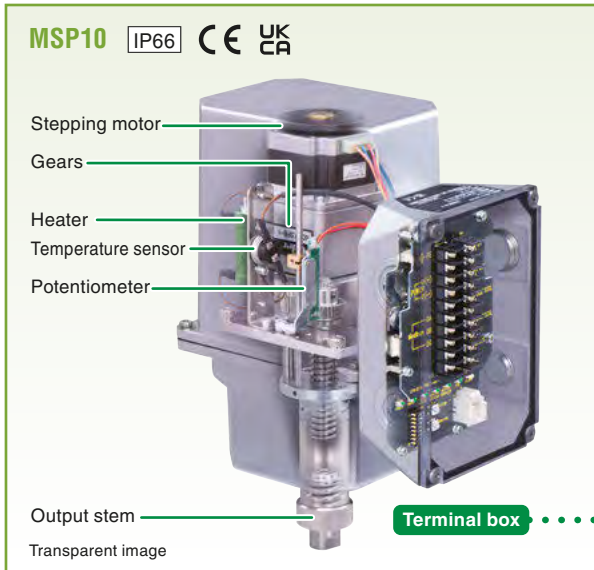
- Max. rated torque: 600 N·m (443 lbf·ft)
- Max. turn: 90°



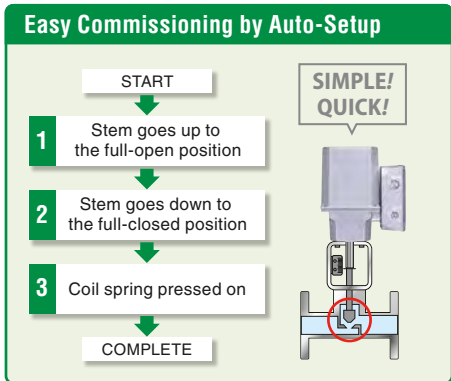
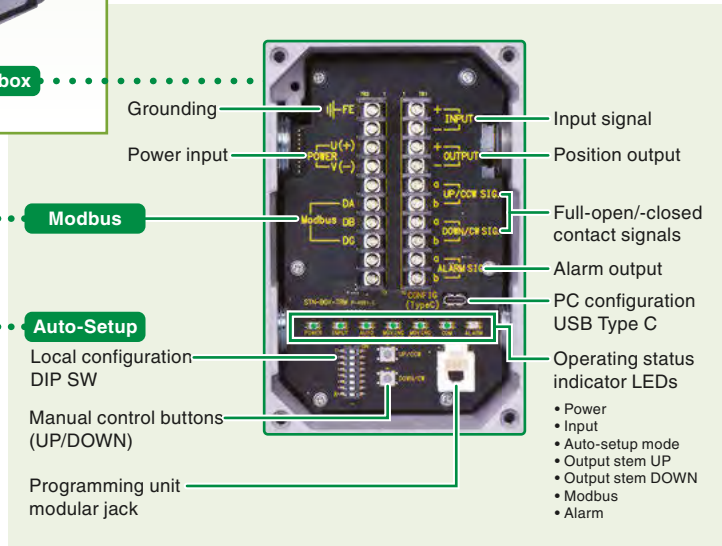
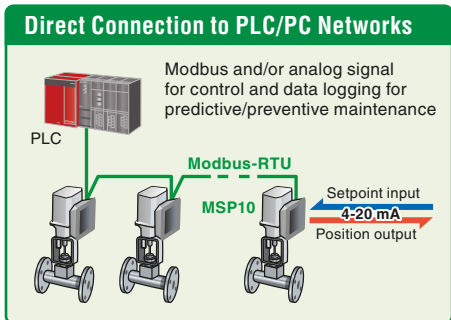
IP66 CE

# MSP10 Linear Motion Electric Actuator

- Max. rated thrust: 2500 N (562 lbf)
- Max. stroke: 40 mm (1.57 in)



- ▮ Stepping motor drive
- ▮ High-speed operation control with 1/1000 resolution
- ▮ Auto-setup function makes the initial adjustment work simple and quick.
- ▮ 4-20 mA output plus Modbus-RTU communication for control and maintenance
- ▮ Thrust buffering by built-in coil spring at both ends of stroke
- ▮ Terminal box with transparent cover equipped with operating status indicator LEDs
- ▮ Operator access to the terminal box only



## MRP10: Rotary Motion

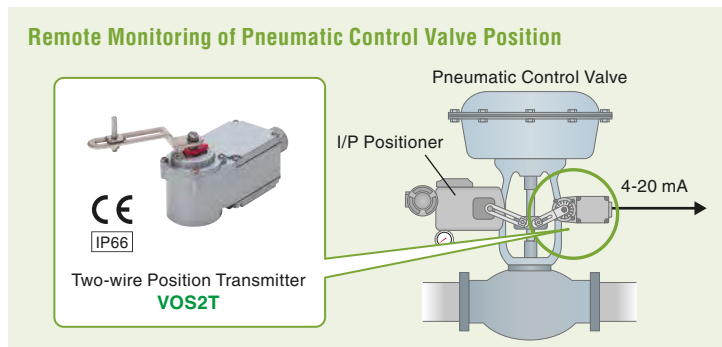
- Max. rated torque: 50 N-m (36.9 lbf-ft)
- Max. turn: 90°



## Two-wire Position Transmitters

### VOS2T / VOS2T-R

- ▮ Detecting mechanical position of pneumatic and electric actuators to send a proportional 4-20 mA signal
- ▮ Linear motion type ( $\pm 22.5^\circ$ ) or rotary motion type ( $\pm 45^\circ$ )
- ▮ Brushless design for long lasting reliability
- ▮ Lightweight & compact



Four-wire Signal Conditioners

Two-wire Signal Conditioners

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Process & Temperature Controllers

IoT Components

Final Control Components

Lightning Surge Protectors

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# LIGHTNING SURGE PROTECTORS

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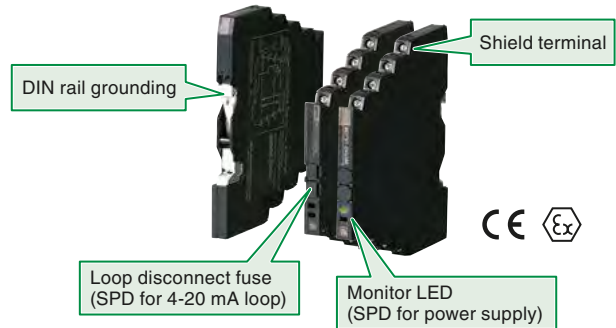
Final Control Components

Lightning Surge Protectors

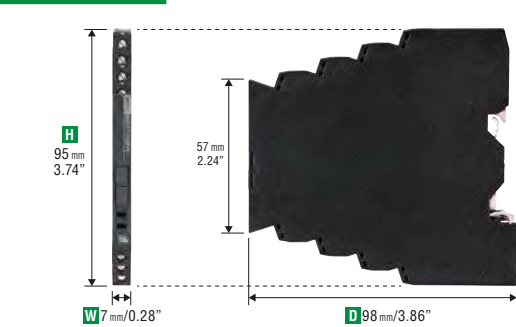
## Ultra-slim Lightning Surge Protectors

### MD7 Series

- High density mounting with 7 mm (0.28 in) wide modules
- Excellent protection by multi-stage SPD
- Max. discharge current 20 kA (8/20 µsec)
- Independent shield terminal (3 for signal, 1 for shield)
- Floating mode for the shield selectable to avoid ground loops
- Optional loop disconnect fuse for 4-20 mA signal line to separate the MD7 failed in shortcircuit mode, to protect other devices
- DIN rail mounting / grounding
- Conforms to IEC 61643-21, Categories C1, C2, D1



### MD7 Series



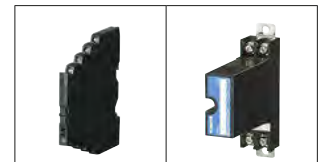
### MDP Series

#### Plug-in Based Mounted

- Light-weight, easy-to-handle, plug-in construction
- Excellent protection by multi-stage SPD
- Head element can be removed and tested without disconnecting wires.
- Base socket connects input/output signals when the head element is removed.
- Wall or DIN rail mounting (with adapter A-33)



### MD7 / MDP Series Selection Guide



APPLICATION	MD7 SERIES	MDP SERIES
4-20 mA loop, pulse signal, 24 V	MD7ST-24	MDP-24-1
4-20 mA loop, life monitor	MD7AST	MDPA-24
2-wire transmitter loop, 1- or 2-channels	MD72W MD72WD	---
3-wire transmitter loop	MD72W	---
Thermocouple transmitter	MD7TC	MDP-TC
RTD transmitter	MD7RB	MDP-RB
Potentiometer & transmitter	MD7PM	MDP-PM
Strain gauge & transmitter	MD7LC	MDP-LC
Self-synch & transmitter	MD7JS	MDP-JS
Pulse sensor & transmitter	MD7PL	MDP-SP
DC power supply, 12/24 Vdc	MD7DP	MDP-D
AC power supply	MD7AP-100 MD7AP-200	MDP-100 MDP-200
RS-422 / RS-485	MD74R	MDP-4R
PROFIBUS-PA	MD7PA	MDP-PA
FOUNDATION Fieldbus	MD7FB	MDP-PA
LonWORKS (FTT-10A)	MD7LWA	MDP-LWA

### Battery Powered Health Testing

#### MD7AST / MDPA-24

- Protects 4-20 mA & pulse signals
- Battery powered life monitoring function
- 'Check' button with indicators alerting panel inspectors of the surge protector's health



## Field Transmitter Cable Conduit Mount

MD6N-24 / MD6T-24 / MD6P-24

- Protects 4-20 mA & pulse signals
- Directly mountable to the cable conduit of 2-wire transmitters and other field devices in an outdoor enclosure



## CC-Link IE Field Use

MDCAT-NC

- Approved and recommended by CLPA
- LAN cable shield wire can be floating or grounding by shortcircuit bar.



## CC-Link Use

MDW5-CC

- Approved and recommended by CLPA
- CC-Link Ver.1.10 / 2.00



## PoE Plus / 1000BASE-T Ethernet Use

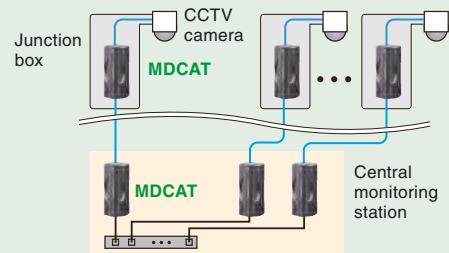
MDCAT / MDCAT-A



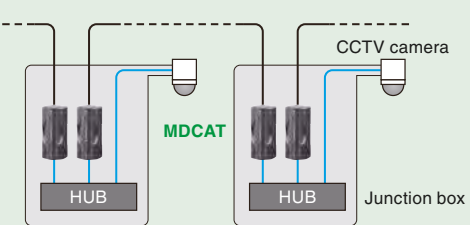
- Power-over-Ethernet compatible
- 1000BASE-T / 100BASE-TX / 10BASE-T
- Ideal to protect network devices powered over Ethernet such as webcams
- LAN cable shield wire can be floating or grounding by shortcircuit bar.
- Conforms to IEC 61643-21, Categories C1, C2



### Star Connection



### Cascade Connection



## Life Monitor & Surge Counter

MAA-100 / MAA-200 / MAAC-100 / MAAC-200

- Protects AC power supply lines
- Life monitor function
- Alarm contact output to alert externally the surge protector's health



## One-port SPD for Power Supply

MAKF / MAT2 / MAT3

- Thermal breaker ensures degraded heat element to be automatically separated from the power lines to prevent overheating.
- MAT2 / MAT3 applicable to three-phase power lines in single module



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## About Us

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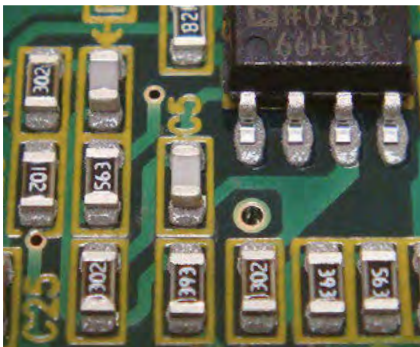
Paperless  
Recording System

Process &  
Temperature  
Controllers

IoT Components

Final Control  
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Lightning Surge  
Protectors



# Customer First Service Policies

All products and services are provided outside Japan through our authorized distributors.

We are trying to enhance the customer satisfaction with the following five service policies.

As to the terms and conditions of a specific service, consult us for details.

### 1. Continued Products Availability

We have basic policy of never to discontinue our products without providing compatible replacements.

We always strive to procure all the electronic parts for our products. When a certain electronic part is no longer available, we will make best effort to provide a product compatibly replaceable with the existing product as long as there is substantial demand for such product.

### 2. Fast and Precise Delivery

The standard manufacturing lead time for most of our products is 5 days.

Quick Service Center is available for 24-48 hours shipment.

Once a delivery time is promised, the customer can of course count on us to deliver them precisely on time.

### 3. Special Specifications Service with no extra charge

Special specification products can be supplied without additional charge for major product series, except for those requiring excessive labor or materials.

We are putting our effort into expansion of the scope of Special Specifications Service to all of our products. Special Specification Service will be available to more product series in the future.

For detailed terms and conditions applicable to each specific product, consult us.

### 4. Special Repair Service

During the service period of 36 months from the date of purchase, we will provide free repair service for a damage or malfunction caused by a user's mistake when we determine at our discretion that cause of the damage or malfunction falls into the "Service Coverage" set out as conditions of this service. Such free repair service will be limited to one repair per cause of the damage or malfunction.

For detailed terms and conditions applicable to each specific product, consult us.

### 5. Factory Setting Service with no extra charge

Configuration setting for programmable products is free of charge upon the customer's request for once when ordering, except for those requiring special engineering (e.g. multi-function PID controllers).

For detailed terms and conditions applicable to each specific product, consult us.

# Locations

## JAPAN

**Osaka Main Factory**



**Kyushu Sales Office**

**Kyoto Techno Center**



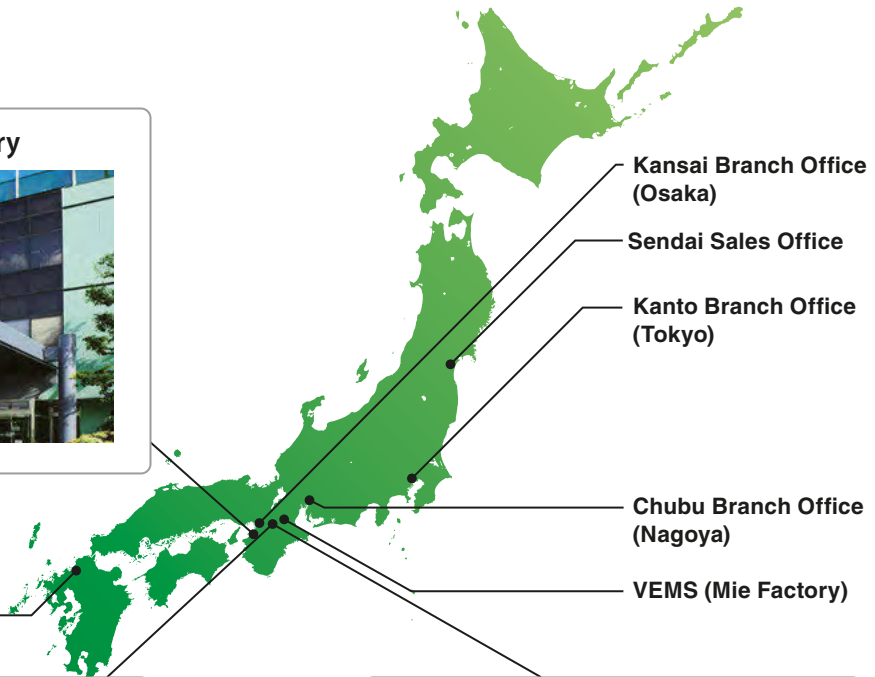
**Type testing and evaluation facilities**

- VCCI (Japan) registered anechoic chamber
- 6 m<sup>2</sup> shielded room capable of conducting multiple tests at once

**Kyoto Research Center & Factory**



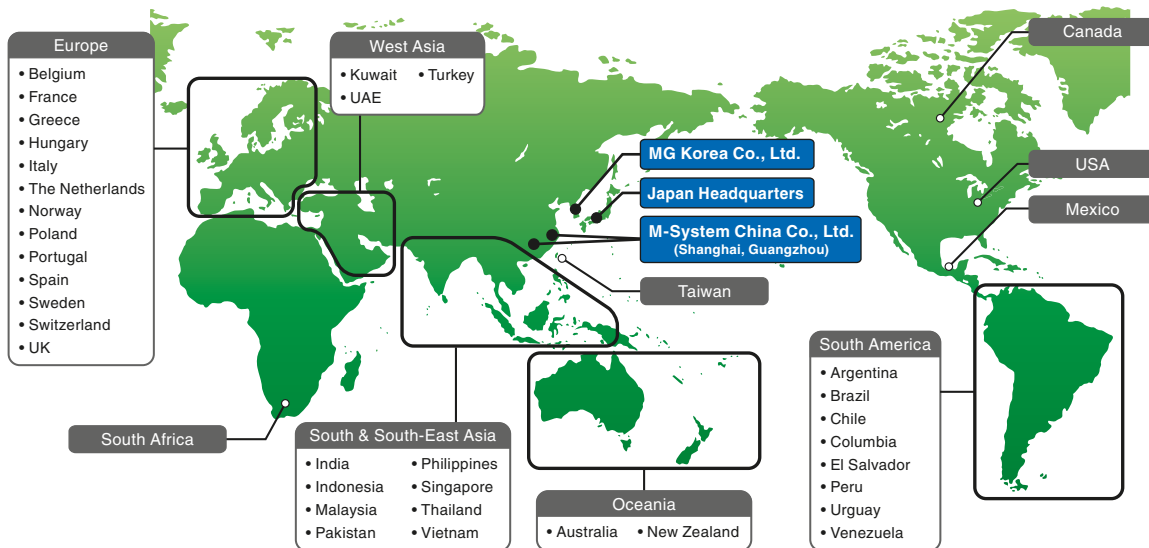
- Second manufacturing location inspired by BCP revised after the Great East Japan Earthquake in 2011
- Showcase plant utilizing M-System's BA controllers



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About Us & Locations

## GLOBAL SALES NETWORK



# Find Complete Product Information on Our Global English Website.

## Services & Support

You can access all downloadable materials including setup tools (software), drivers and device profiles, catalogs and videos.

## Demo Site

Browse trend and data monitor windows of data logging systems using DL30, DL8 and other products.

## Video Library

Videos on the products and the company, educational materials, virtual exhibition can be viewed on YouTube.

## Specifications & Manuals

Enter either a product model number or a keyword to search for data sheets, instruction manuals and other related documents.  
Compare specifications to find exactly what you need.  
You can narrow your search by product categories.

## Product Category Index

Go directly to a product category to find more about products introduced in this catalog and even more selections.

## Application Examples

Find products suitable for your application fields.



## Regional Language Websites

Product information including data sheets, instruction manuals and videos is available in multiple languages.

日本語

ENGLISH

中文(简体)

한국어



Japanese



Chinese (Simplified Chinese)



Korean

**MSYSTEM** E-mail  
M-SYSTEM CO., LTD. info@m-system.co.jp



Website



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