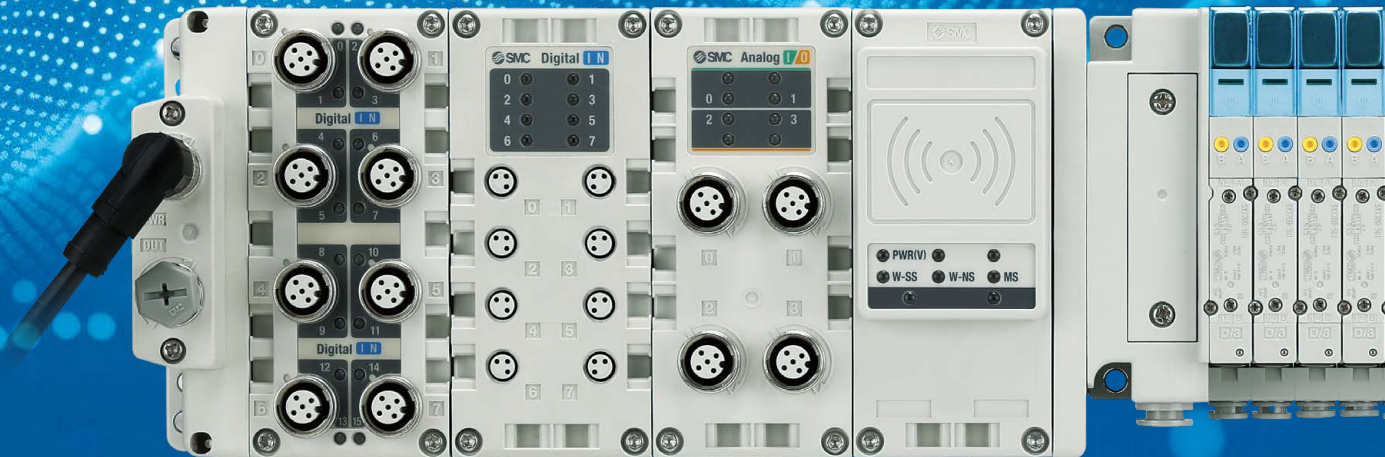![SMC logo]

# Remote I/O, goes to "Wireless"

# EXW1/EX600-W *Series*

# *Do you have any of these*

## Issues with fixed parts
**Wired**

· Cost of **long wiring** lengths such as conveyors
· Too much wiring time in **shielded spaces**
· Wiring work at **high locations** (or places)
· Cluttered work environment with **lots of wires**
· Cable **deterioration** in chemical environments, etc.
· Additional costs for sensors in energy **visualization**

## Issues with moving parts
**Wired**

· Failure with couplings in **tool changer**
· **Cable** damage due to accidental pulling or bending
· Not enough contact points to **add sensors** to robots
· Unable to install communication wiring to **AGV's** for additional I/O
· **Rotating devices** require frequent maintenance due to many consumable parts.
· Difficulty on repairing broken wires in **cable carriers**
· Mass-production machines require lots of **wiring**.

## SMC wireless systems create solutions to all of these issues

*Solving wireless concerns while avoiding radio interference and coexisting with existing wireless devices.*

Compact

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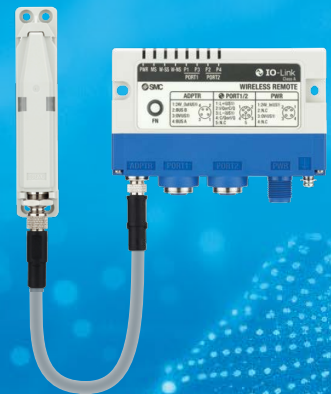
### Feature ❶  Will easily coexist with other wireless devices

■ **Checks for interference from other wireless devices before transmitting a signal.**

Wireless signal STOP

RFID

Wireless LAN

Site noise

Bluetooth®

■ **High security through encryption**

■ **Remote high-speed connection**
Start of communication in as little as **250 ms**
∗ Depends on the communication environment

■ **Able to check the wireless status via LED and Internet**
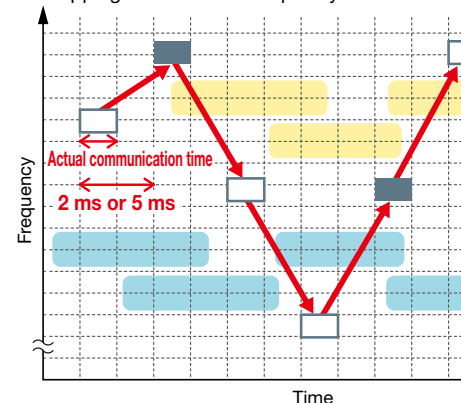
PC

PWR MS W-SS W-NS P1

PO

SMC

AD

### Feature ❷  Reduces wireless stable wireless

■ **Frequency hopping**
SMC's proprietary protocol reduces radio interference by continuing communication while changing frequencies.

■ **Frequency channel selection (F.C.S)**
Hopping with selected frequency channel

Frequency

Actual communication time
**2 ms or 5 ms**

Time

1

# *issues/concerns?*

Concerns existing for both wired and wireless sensors

## Concerns on to the "wireless" factory

**Wireless**

- · If possible to coexist with existing wireless devices?
- · If not interfere with existing wireless devices?
- · Network security
- · Status of communication
- · **Disconnection of wireless communication**
- · Network quality/stability on **Wireless LAN or Bluetooth®**
- · **Noise** from power supply or welding machines
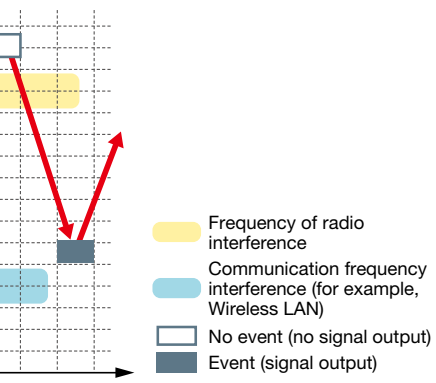- · **Various obstructions** that may affect the wireless communication in the factory

## Type

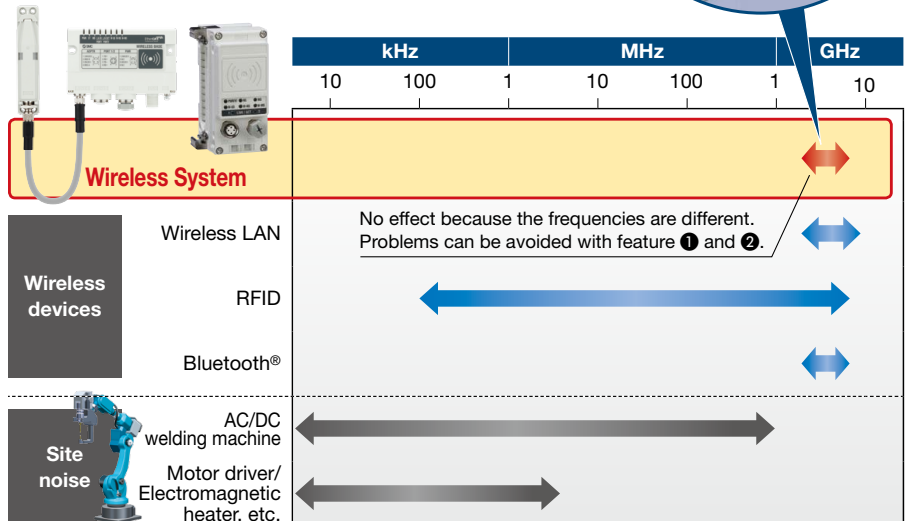## Modular Type

Not affected by obstructions
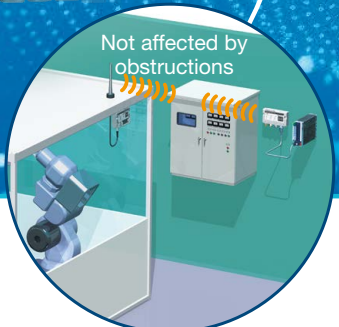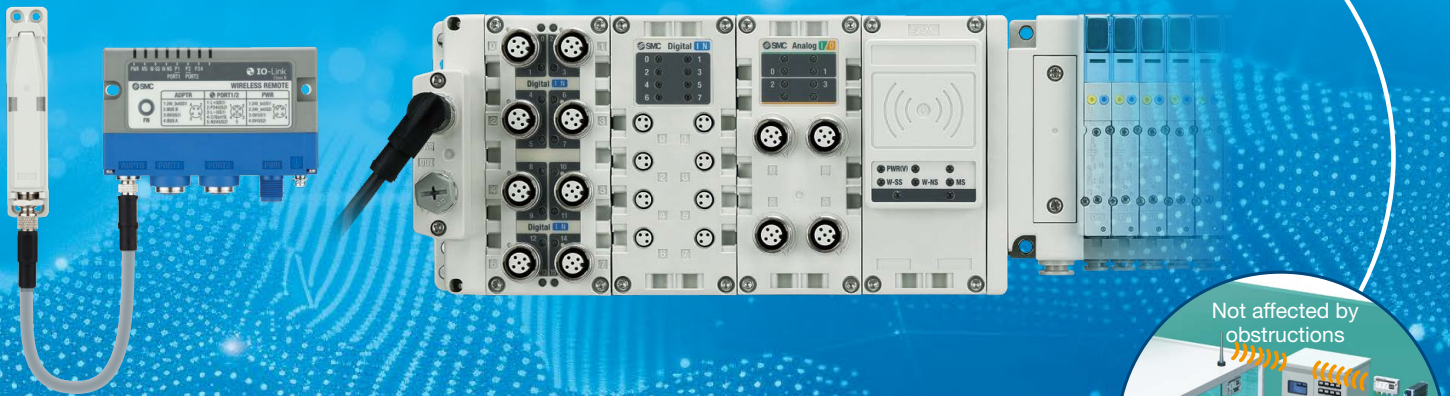
## interference and creates a environment within the factory.

■ **Event communication system**

Wireless communication is performed only when there is an update of information from sensors, reducing the number of radio wave transmissions and minimizing interference with other wireless devices.

Frequency of radio interference

Communication frequency interference (for example, Wireless LAN)

No event (no signal output)

Event (signal output)

## Feature ❸ SMC's proprietary wireless method, different from Wireless LAN, etc.

| | kHz | | | MHz | | | GHz | |
|---|---|---|---|---|---|---|---|---|
| | 10 | 100 | 1 | 10 | 100 | 1 | | 10 |

**Wireless System**

**Wireless devices**

Wireless LAN — No effect because the frequencies are different. Problems can be avoided with feature ❶ and ❷.

RFID

Bluetooth®

**Site noise**

AC/DC welding machine

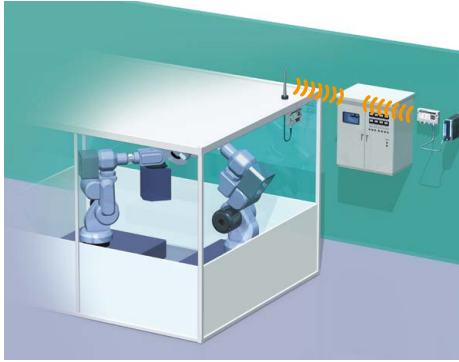Motor driver/ Electromagnetic heater, etc.

### Trademarks
The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc.

SMC

# Examples of solutions using devices
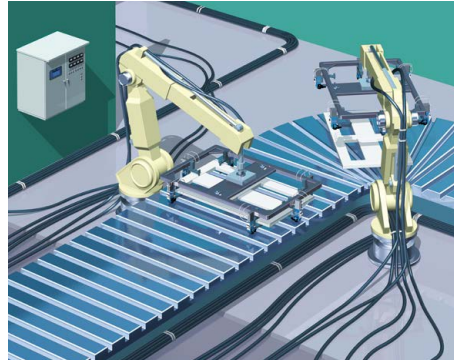
## Issues resolved with fixed parts

### Wiring in "hard to access" area

· Wireless communication eliminates the need for wiring in shielded spaces where wiring is difficult.
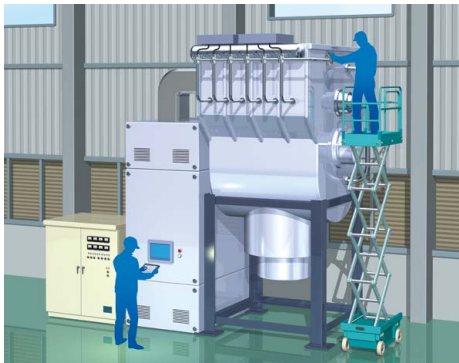
### Cable reduction

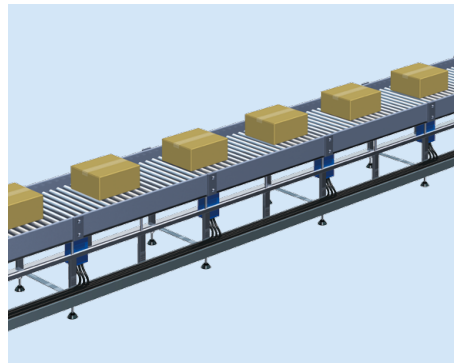· Transform a cluttered environment with wires into a clean wireless environment

### Work in high locations

· Wiring is no longer necessary in high locations due to wireless communication.

### Shorter wiring runs

· Long-distance wiring, such as cabling in conveyor machines, becomes unnecessary with wireless connection
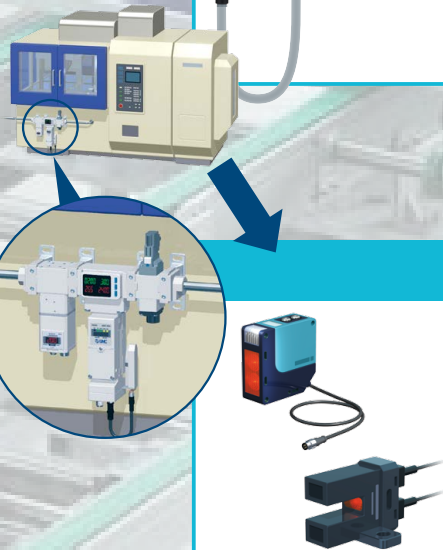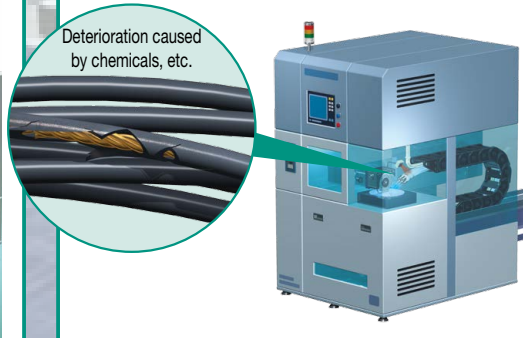
### Reduce maintenance hours

· No wiring required for mass-production machines or when reinstalling equipment.
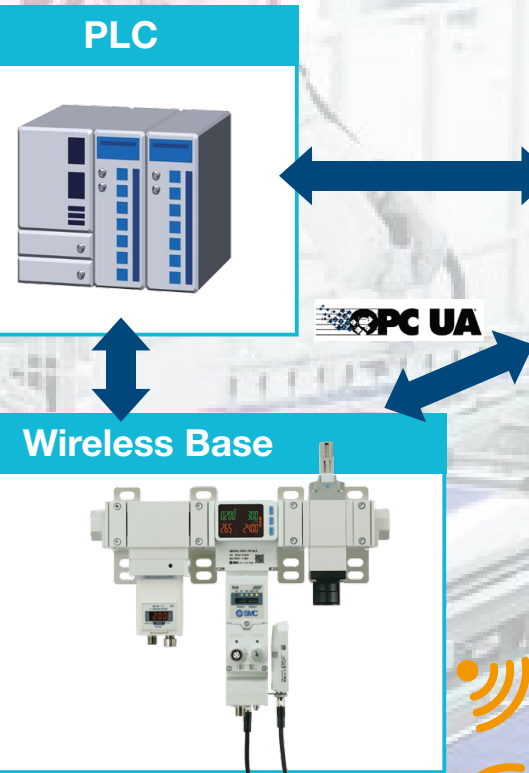
### Reduced possibility of wiring deterioration

· No need to worry about cable deterioration due to wear from cable carriers or exposure to chemical sprays, etc.

Deterioration caused by chemicals, etc.

SMC

# *Wireless Remote I/O*

## PLC

## Wireless Base

## Wireless Remote

SMC wireless communication allows for data gathering from SMC and third-party sensors.
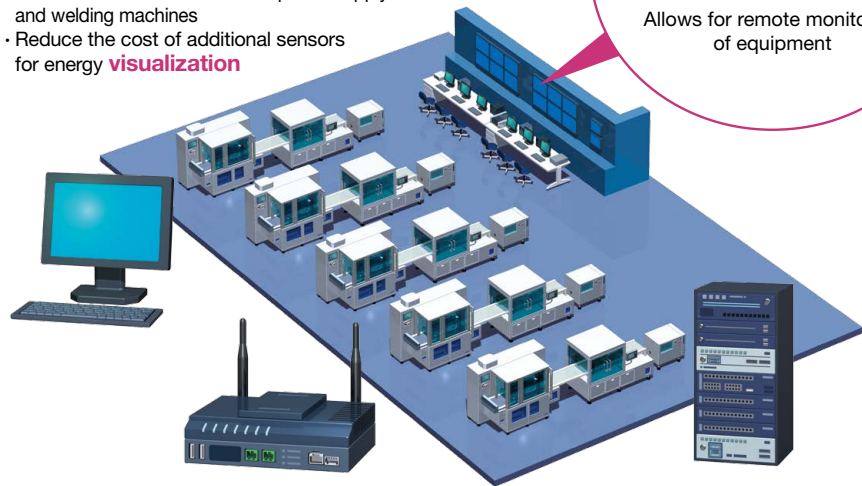
## Types of sensor

**OPC UA**

## Issues resolved by going wireless

### Centralized monitoring allows for...

- Able to **coexist with other wireless devices**
- Completely separate communication from **Wireless LAN and Bluetooth®**
- **Avoid electrical noise** from power supply cables and welding machines
- Reduce the cost of additional sensors for energy **visualization**

Allows for remote monitoring of equipment

## Issues with moving parts

### Rotary table / cable carrier transport

- Reduced coupling problems with rotating parts
- No broken wires with less cable carriers

Wired system
Communication line
Power supply line

Power supply line only
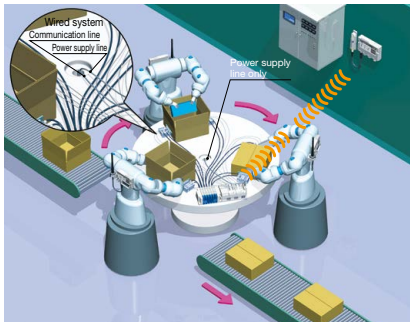
### Tool Changer

- High-speed communication and quick start-up
- Connection problems to be eliminated
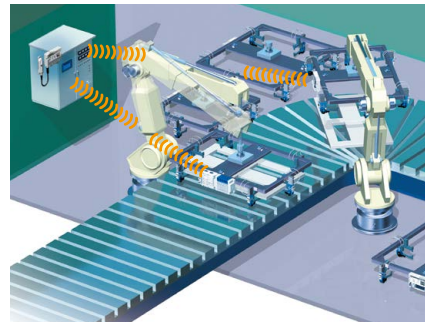
### AGV

- Wireless communication can be implemented in AGV's and other moving equipment if power can be supplied.
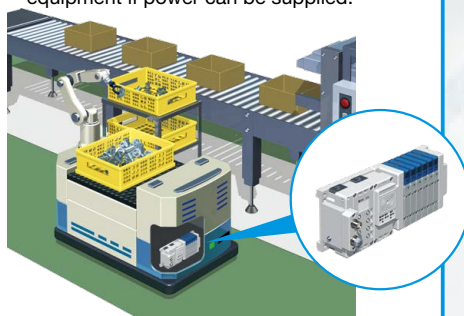
### Robot

- Teaching operation becomes easier without wire interference.
- Eliminates wiring disconnection problems.
- Easy to increase the number of I/O points
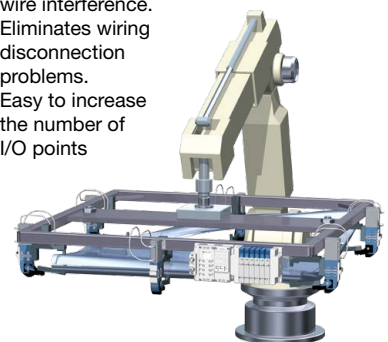
# SMC Digital Architecture

## Configuration Examples

**Reduce wiring and enable centralized monitoring of digital, analog, and IO-Link devices through combination of wireless and wired connections**

PLC

**OPC UA**

EtherNet/IP

PROFINET®

EtherCAT.

CC-Link

Fieldbus

### Centralized monitoring

**Host system**

PC/server

SCADA/HMI       User cloud

### Wireless base

Compact Type **EXW1**

### Remote I/O

Integrated input-output type **EX600**

**IO-Link**

### Wireless remote I/O

Compact Type **EXW1**

Output

Air Management System
**AMS□-SA**

Modular Type **EX600-W**

EX600 I/O unit

Remote

Solenoid valve

### Input/Output device

**Vacuum unit**

### Output devices

**Valve manifold (Plug lead)**

**Solenoid valve**

**Electric actuator**

**Ionizer**

**Others**

Indicator light
Relay
Buzzer

### Input devices

**Auto switch**

**Pressure switch**

**Flow switch**

**Others**

Proximity sensor
Photoelectric switch
Limit switch

SMC

# The compact type EXW1 and modular type EX600-W can be used in combination.*1

*1 When used in combination, the communication speed and response time are limited to the specifications of the EX600-W.
(See the sample system configuration.)

**Wireless remote**

Compact Type **EXW1**

**IO**-Link

Port class A

Port class B

**Port class A devices**

**Input devices**

**Actuator position sensor**

**Pressure switch**

**Flow switch**

**Input/Output device**

**Electro-pneumatic regulator**
**Electronic vacuum regulator**

**Step motor controller**

**Port class B device**

**Output devices**

**SI unit for valve**

Port class B
SI unit

**Output devices**

**Gap checker**　**Flow switch**

**SI unit for valve**

**Electric actuator**

**SMC**

6

# SMC Digital Architecture

## Wireless System EXW1/EX600-W Series

- Noise resistance
  Uses the 2.4 GHz ISM frequency band
  Frequency hopping: Every 2 ms (Fastest)
- Communication cables not required
  Reduced wiring work, space, and cost
  Minimized disconnection risk
- Provides communication stability in FA environments
- Modular connection is possible. (EX600-W)
- High security thanks to unique encryption
  Communication distance: Max. 100 m

| Series | Enclosure | Communication protocol | Applicable valve |
|---|---|---|---|
| **EXW1** | IP20/IP67 | EtherNet/IP™<br>PROFINET<br>OPC UA<br>CC-Link<br>EtherCAT<br>DeviceNet®<br>IO-Link∗ | — |
| **EX600-W**<br>(Remote) | IP67 equivalent | | JSY1000, 3000, 5000<br>SY3000, 5000, 7000 (Plug-in)<br>SV1000, 2000, 3000<br>S0700 (IP40)<br>VQC1000, 2000, 4000, 5000 |

∗ Excludes EX600-W

## Air Management System AMS20/30/40/60 Series
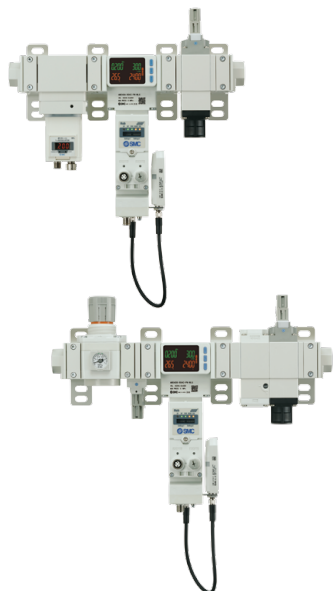
- Air consumption: Up to 62% reduction
  Monitors the equipment standby state (when production is stopped) and automatically reduces the pressure. Reduces unnecessary air consumption
- Compatible with OPC UA
  Direct connection enables easy data communication.
- Compatible with wireless systems
  Communication cables not required
  High security thanks to unique encryption
  Communication distance: Max. 100 m
- IO-Link compatible

| Series | Size | Port size | Flow capacity L/min | Communication protocol | Output data |
|---|---|---|---|---|---|
| Electro-pneumatic regulator type<br>**AMS20A/30A/40A/60A** | 20<br>30<br>40<br>60 | 1/8, 1/4, 3/8, 1/2, 3/4, 1 | 5 to 500<br>10 to 1000<br>20 to 2000<br>40 to 4000 | PROFINET<br>EtherNet/IP™<br>EtherCAT<br>OPC UA | Instantaneous flow<br>Accumulated flow<br>Pressure<br>Fluid temperature<br>Various sensor information transmitted via IO-Link Diagnostics. |
| Regulator type<br>**AMS20B/30B/40B/60B** | 20<br>30<br>40<br>60 | 1/8, 1/4, 3/8, 1/2, 3/4, 1 | 5 to 500<br>10 to 1000<br>20 to 2000<br>40 to 4000 | PROFINET<br>EtherNet/IP™<br>EtherCAT<br>OPC UA | Instantaneous flow<br>Accumulated flow<br>Pressure<br>Fluid temperature<br>Various sensor information transmitted via IO-Link Diagnostics. |

**Trademark**
EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
EtherNet/IP® is a registered trademark of ODVA, Inc.

⚠ **Safety Instructions** | Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

## SMC Corporation  https://www.smcworld.com