Mini Vortex Flowmeter GTS

Combined Temp & Flow sensor

IO-Link Communication Industry 4.0 Ready	Digital & Analog Integrated Signals	Combined Temp & Flow Sensor	TFT Color Screen High-Resolution Display	EN + GUI Intuitive Menu

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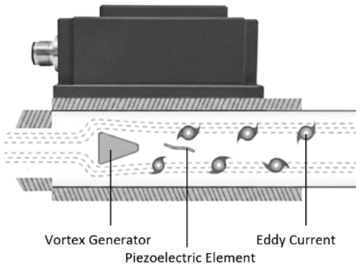
1. Product Description

GTS_Mini Vortex Flowmeter operates based on the Kármán vortex street principle, theoretically demonstrated by Theodore von Kármán in 1912. When a columnar bluff body (vortex generator) is placed in a flowing fluid, alternating vortices are generated downstream.

The fluid velocity is directly proportional to the vortex frequency. A piezoelectric element detects the number of vortex pulses, and the signal is amplified and processed by circuitry to calculate the fluid flow rate.



2. Product Features

● IO-LINK Communication Industry 4.0 Ready	● Digital & Analog Integrated Signals
● Combined Temp & Flow Sensor	● TFT Color Screen High-Resolution Display
● High Precision Excellent Stability	● En + GUI Intuitive Menu
● IP67 Rating Full Waterproof Housing	● Scale-Resistant Corrosion-Resistant
● Smart Install QR-Guided Setup with Real-Time Support	

The **GTS_Mini Vortex Flowmeter** features a simple structure, high accuracy, and easy installation/maintenance, enabling real-time monitoring of liquid flow and temperature in pipelines.

It provides 4-20mA signals for flow and temperature, along with 485 communication, IO-Link, alarm switch output, and a color TFT display screen for real-time visualization of fluid flow rate and temperature.

This integrated temperature-flow monitoring solution is widely used in industries such as new energy, photovoltaic, energy storage, petrochemicals, power, metallurgy, steel plants, and food processing.

● TFT Color Screen Display

English display menu, more user-friendly

● Screen Rotatable Display

Adapts to pipelines in any direction

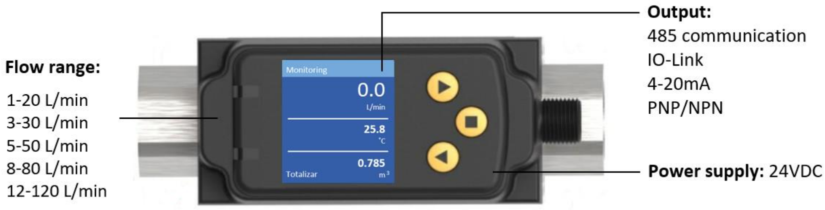
Screen freely adjustable
with 360° rotation

Forward display | Right-oriented display | Reverse display | Left-oriented display

● Supports 4–20mA, 485, IO-Link

Bidirectional communication, standardized interface, status/monitoring self-diagnosis

The new **GTS_Mini Vortex Flowmeter** not only provides 4–20mA signals for flow/temperature, 485 communication, and alarm switch output, but also integrates IO-Link communication technology and adds a cumulative flow function, meeting the needs of users across various industries.



● Supports 4-20mA, 485, IO-Link

High-precision data transmission, cost reduction, simple parameter settings

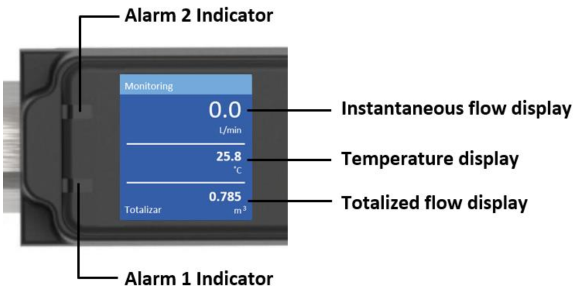
IO-Link parameter values and settings can be easily modified via dedicated software.
Sensors can be replaced immediately using the same parameters from the data storage of the IO-Link master station, requiring no additional configuration for simple and convenient operation.

Configuration File (IODD file) The IODD file is the abbreviation of IO Device Description file, which is required for configuring the device or connecting to the master station. Save it to the PC used for configuration.

● Panel Introduction

Instantaneous flow display, totalized flow display

The TFT screen displays current pipeline flow value or temperature value.
Three buttons on the panel allow easy setting of flow alarm contacts and temperature alarm contacts.



● Housing Protection Class IP67

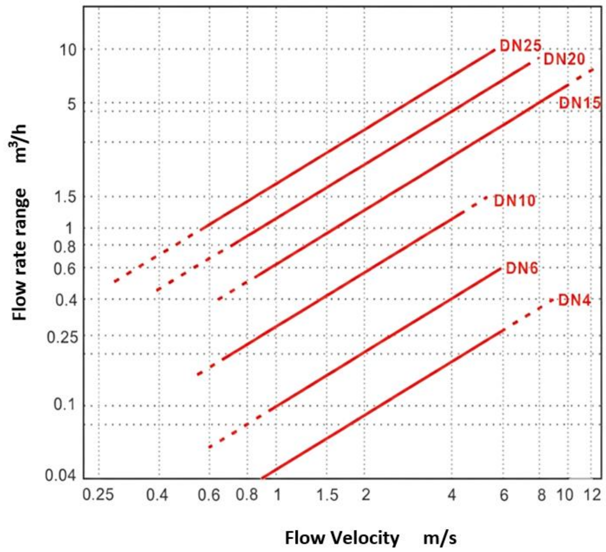
Compact size, high flow capacity, stable and reliable performance

GTS_Mini Vortex Flowmeter installed side-by-side with compact structure.
Sensor housing protection class IP67 for use in harsh environments.

3. Technical Specifications and Parameters

Flow	**Measuring Range**	See the comparison table below
	Accuracy	±3% FS (Full Scale)
Temp.	**Measuring Range**	0 ~ 100°C (customizable)
	Resolution	≤ 1°C

Display Type & Resolution	OLED / 128 × 64
Power Supply & Consumption	24VDC / 3W
Switching time	Turn-on: ≤ 5s (1~3s) / Turn-off: ≤ 5s (1~5s)
Output Supply & Consumption	4-20mA analog / 485 / IO-Link
Alarm contact type	NPN / PNP
Insulation resistance	50MΩ @ 100VDC
Contact Capacity	24V, 50mA
Interfaces	G1/4", G3/8", G1/2", G3/4", G1" internal thread
Housing material	Aluminum alloy
Base material	SUS304
Environmental conditions	-20 ~ 85°C, <85% RH
Protection grade	IP67



Pipe Diameter	Flow Rate Range	Thread
DN8	1 ~ 15 L/min	G1/2"
DN10	3 ~ 30 L/min	G1/2"
DN15	5 ~ 50 L/min	G1/2"
DN20	8 ~ 80 L/min	G3/4"
DN25	12 ~ 120 L/min	G1"

4. Installation and Configuration Diagram

4-1. Dimension

<table>
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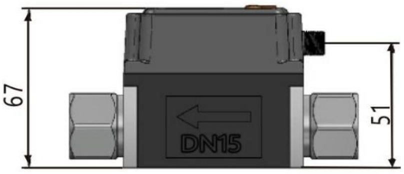
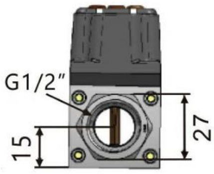
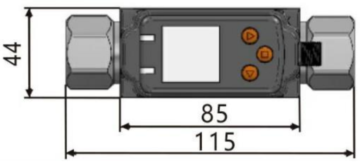
<td>Pipe Diameter
DN8~DN15</td>
<td>






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<td>Pipe Diameter
DN20</td>
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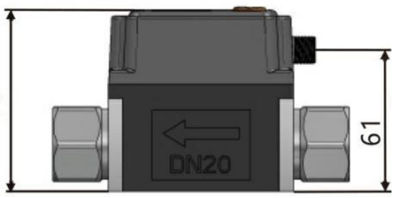

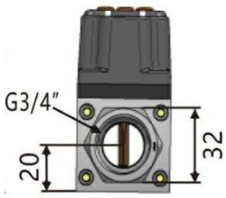

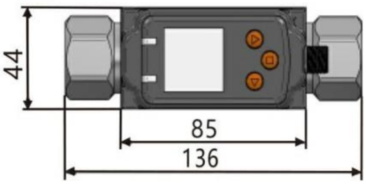

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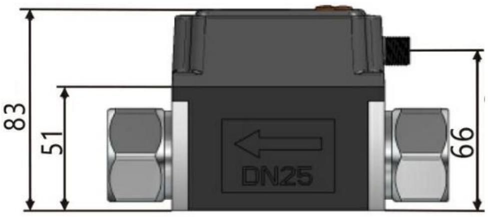
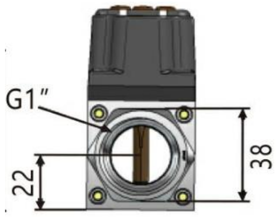
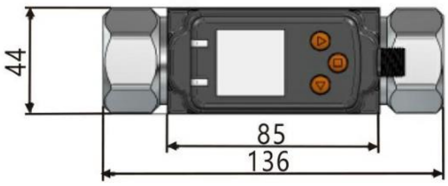
</tr>
<tr>
<td>Pipe Diameter
DN25</td>
<td>






</td>
</tr>
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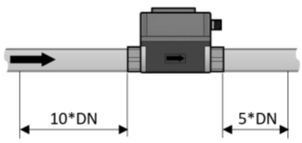
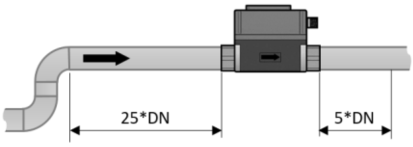
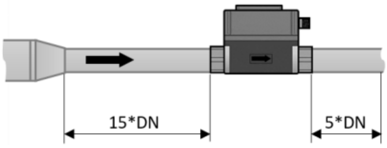
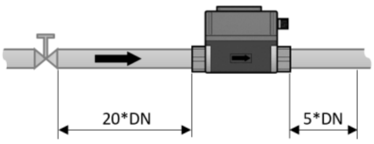
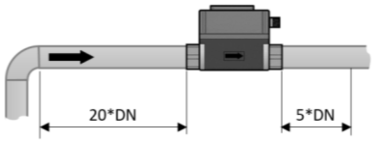
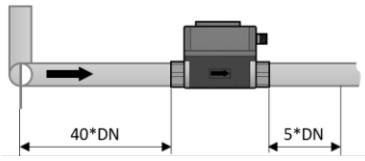
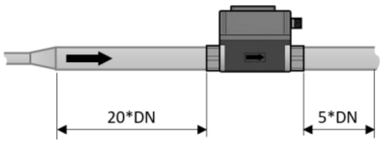
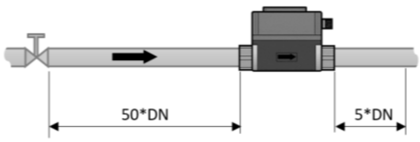
4-2. Installation Instructions

To ensure measurement accuracy of the **GTS_Mini Vortex Flowmeter** and minimize interference from disturbed flow and air bubbles, the following requirements apply to upstream/downstream straight pipe sections:

Inlet Section Flow Restrictors Type	Installation Requirements	
	Inlet Section	Outlet Section
General Case		
Two 90° Elbows in the Same Plane		
Pipe Reducer		
Fully Open Valve		

Inlet Section Flow Restrictors Type	Installation Requirements	
	Inlet Section	Outlet Section
90° Elbow		
Two 90° Elbows in Different Plane		
Pipe Expander		
Fully Open Valve		

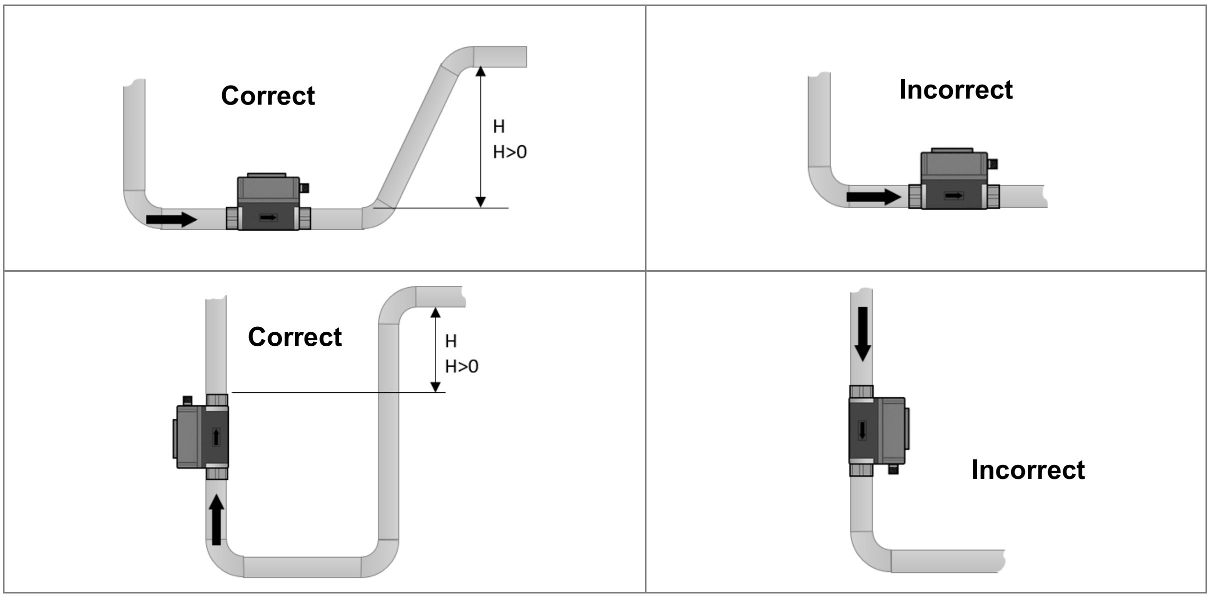
Notes:

The dimensions shown are the straight pipe installation lengths required to ensure accuracy requirements.
If the straight pipe length is doubled, measurement precision can be improved.

- **Upstream**: The minimum allowed straight pipe length must be at least 10 times the pipe diameter. For example, for a DN50 flow sensor, the upstream straight pipe length must be at least 500mm, while the optimal upstream length should be 1000mm.
- **Downstream**: The minimum allowed straight pipe length must be at least 5 times the pipe diameter. For example, for a DN50 flow sensor, the downstream straight pipe length must be at least 250mm, while the optimal downstream length should be 500mm.

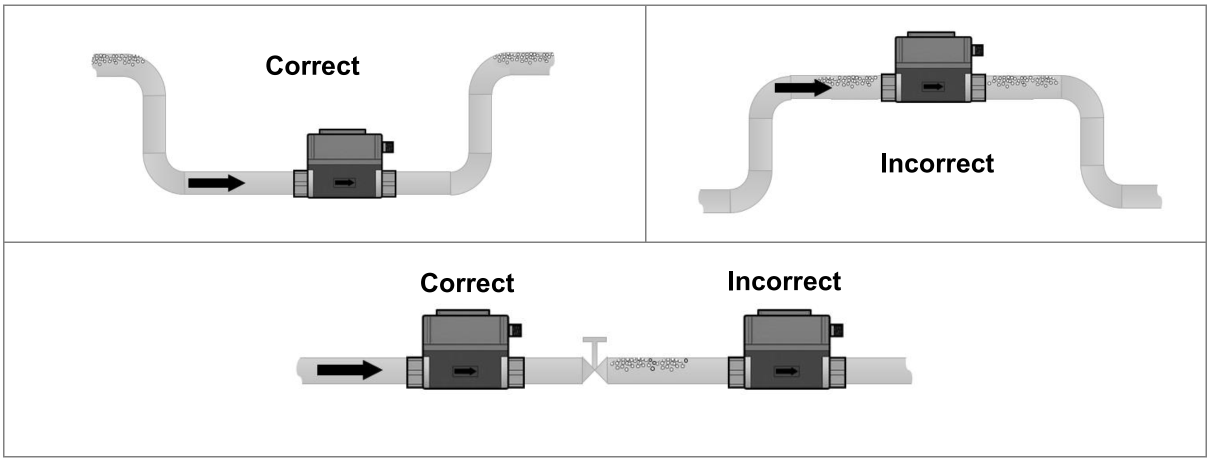
- **The pipeline must be entirely filled with liquid.**

It is critical that the pipe remains completely filled with liquid at all times; otherwise, the flow rate display may be affected, potentially leading to measurement errors.

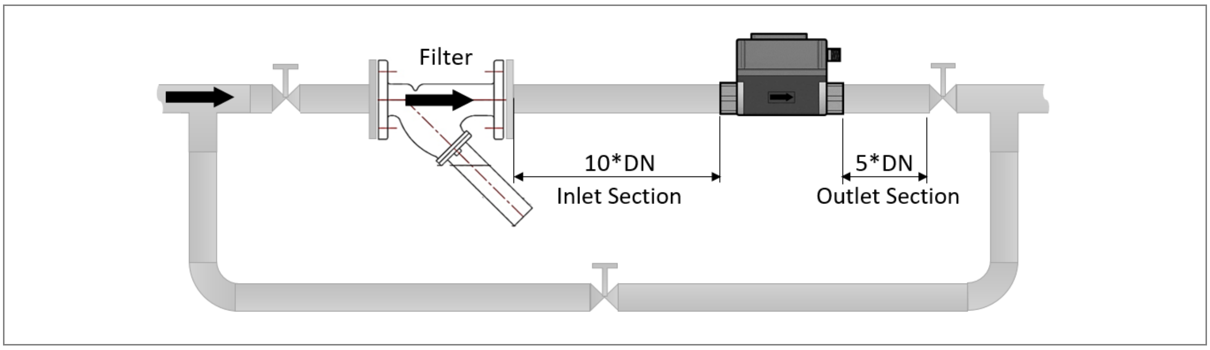


- **Avoid air bubbles.**

If air bubbles enter the measurement pipe, the flow rate display may be compromised, which could result in measurement inaccuracies.



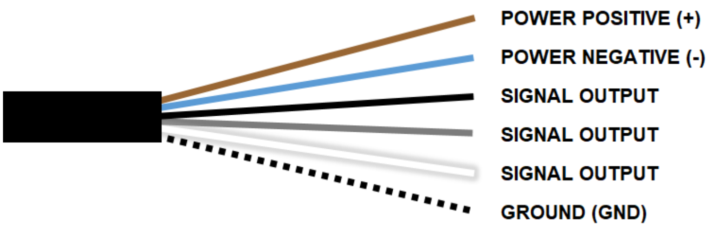
- **Installation location and requirements**



4-4. Pipeline installation precautions

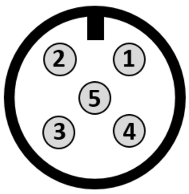
- Sensors should be installed in locations that facilitate maintenance, and must be free from pipeline vibration, strong electromagnetic interference, and thermal radiation effects.
- Horizontal installation: Pipeline inclination should not exceed 5°.
  Vertical installation: Vertical deviation should be ≤5°.
  For non-interruptible flow applications: Install a bypass pipe and shut-off valve; ensure zero leakage in the bypass pipe during measurement.
- Before formal sensor installation in new pipelines: Temporarily connect a short pipe section at the sensor position. Install the sensor only after confirming complete pipeline cleaning.
  For fluids with impurities: Install a filter upstream of the sensor; regularly clean and discharge settled impurities.
- For gas-containing liquids: Install a gas eliminator upstream; outlets of filters/ gas eliminators must be directed to safe areas.
- When installed outdoors: Implement measures to avoid direct sunlight exposure and prevent rain ingress.

4-5. Wiring Instructions



Power Connection: Brown (BN) for Positive (+) and Blue (BU) for Negative (-) power supply
Signal Outputs: Configure Flow/Temperature Alarms and 4-20mA outputs via Black (BK), Gray (GY), and White (WH) wires
Shielded Cable: Aviation-grade shielding design to minimize electromagnetic interference (EMI)

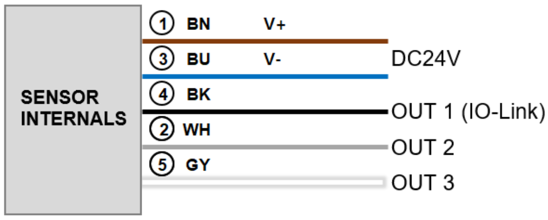
▶Wiring Instructions



Aviation Connector

Users can configure the output types of OUT1, OUT2, OUT3 with four options:
1. Flow Alarm
2. Temperature Alarm
3. Flow 4-20mA Output
4. Temperature 4-20mA Output

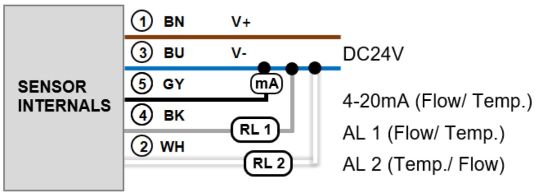
4-20mA, NPN/ PNP Output



①	**Brown(BN)**	Positive (+) Power Supply
③	**Blue(BU)**	Negative (-) Power Supply
④ **(OUT1)**	**Black(BK)**	Flow Alarm Switch Signal, Temp Alarm Switch Signal, IO-Link: C/Q Data Line
⑤ **(OUT2)**	**Gray(GY)**	Flow Alarm Switch Signal, Temp Alarm Switch Signal
② **(OUT3)**	**White(WH)**	Flow: 4-20mA Output, Temp..: 4-20mA Output

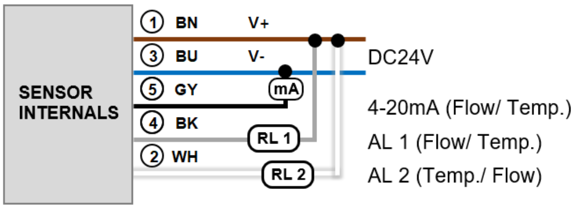
▶ PNP Output

Output 1: PNP Alarm Output,
Output 2: PNP Alarm Output,
Output 3: 4-20mA Current



▶ NPN Output

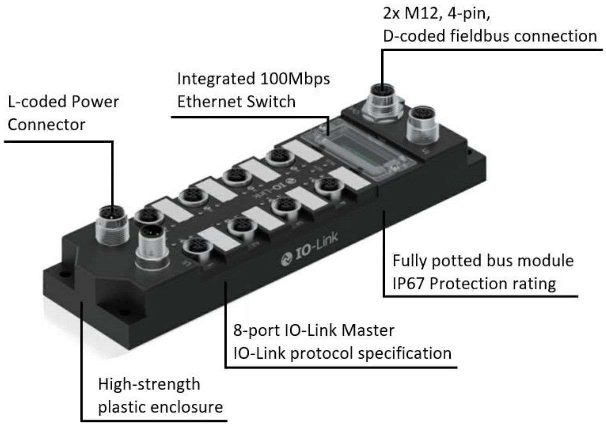
Output 1: NPN Alarm Output,
Output 2: NPN Alarm Output,
Output 3: 4-20mA Current



5. Ordering model selection

Code		Description
Model: GTS		**Mini Vortex Flowmeter**
Flow rate range	**8**	1 ~ 15 L/min
	10	3 ~ 30 L/min
	15	5 ~ 50 L/min
	20	8 ~ 80 L/min
	25	12 ~ 120 L/min
Flow/temperature alarm	**L**	IO-LINK + one channel 4-20mA
	D	Two channels 4-20mA
	R	RS-485 communication

■ IO-Link master/ slave

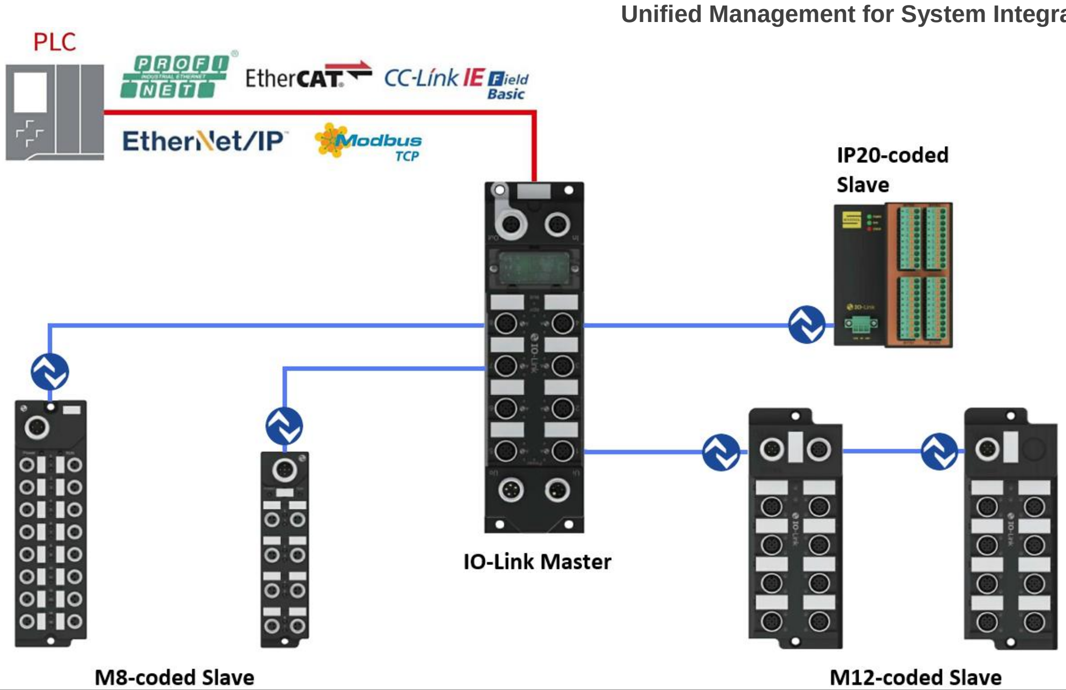


- Multi-protocol 1O-link master
- Built-in Ethernet switch
- Dual-port M12 D-coded Ethernet interface
- 8-port IO-Link Master
- IO-Link Protocol Specification V1.1
- Port Types: Class A & Class B
- M12 A-coded Master Port
- Metal Connectors + High-strength plastic housing
- Shock & vibration resistant
- Resin-sealed electronic circuitry
  IP67 Protection rating

■ IO-Link slave station

- IO-Link remote I/O device
- IO-Link protocol V1.1
- M12 A-coded Class A/ B interface
- 8/16-channel digital input/ output
- 8-channel analog input
  (Pt100/ 0-10V/ 4-20mA/ 0-20mA)
- 16-channel digital I/O
- Self-adaptive I/O with scalability
- Auxiliary power:M12 L-coded
- 32-channel output (PNP/NPN/single-point,0.2A)
- Resin-sealed circuitry
- Protection
- Rating: IP67 (Field)/ IP20 (Cabinet)

Modular Expansion for Device Compatibility.
Unified Management for System Integration



■ IO-Link converter

- IO-Link device converter
- 2-channel analog input (4-20mA/0-20mA)
- IO-Link protocol V1.1
- 8-port IO-Link master
- I/O Link protocol V1.1
- M12 A-coded 4-pin Class A interface
- Semi-transparent housing with visible status LEDs