MTX-Sensor: Air Velocity 0-20m/s

Duct MS10 Modbus

The MTX Air Velocity Duct Modbus Sensor utilizes the hot film principle, with a high-quality sensor manufactured through MEMS technology. This type of sensor boasts exceptional measurement accuracy, a wide measurement range, robust stability, and excellent adaptability to various environments. As a result, it is an excellent option for air velocity measurement across a range of applications.

FEATURES

- Utilizes a **high-precision MEMS** sensor sourced from overseas, which offers excellent long-term stability and anti-interference capabilities.
- Demonstrates strong **anti-pollution** capabilities, ensuring ease of installation and maintenance.

APPLICATIONS

- HVAC
- duct air volume measurement
- clean room ventilation
- laminar flow monitoring processes
- environmental control

ORDERING INFORMATION

600203331 MTX-Sensor Air Velocity 0-20m/s Duct MS10 Modbus

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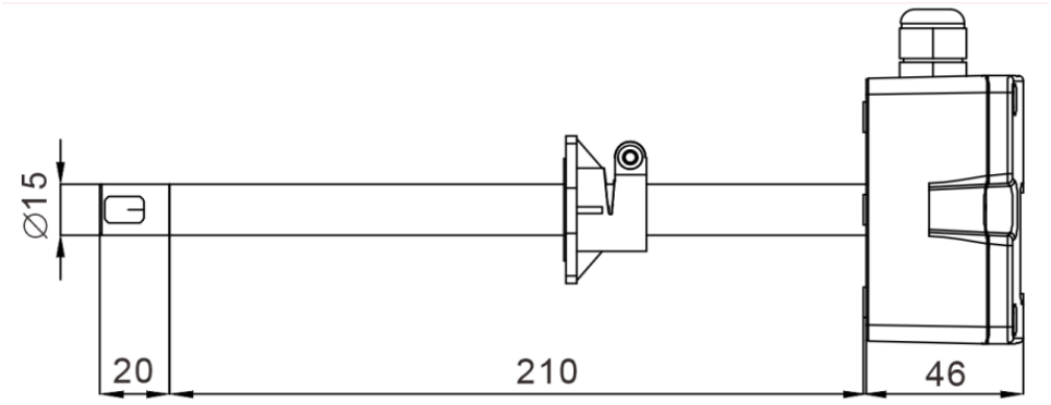
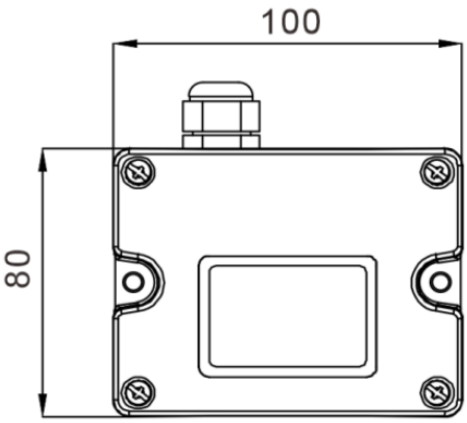
SPECIFICATIONS

Working Voltage	24V AC/DC±20%
Measuring Range	0-20m/s
Resolution	0.01m/s
Output signal	RS485/Modbus
Output load	≤ 500 Ω (Current output), ≥ 2 KΩ (Voltage output)
Working temperature	-10-60℃
Storage temperature	-20-80℃
Probe length	210mm
Protection Class	Shell IP65, Probe IP20
Material	Shell PC, Probe PA6
Electromagnetic compatibility	EN 61326-1
Certifications	RoHS, CE

DIMENSIONS





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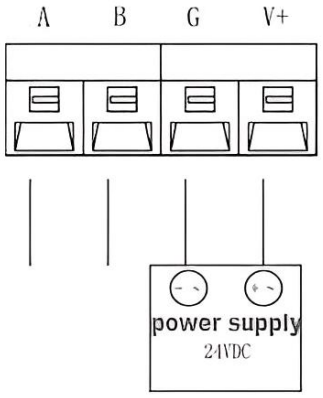
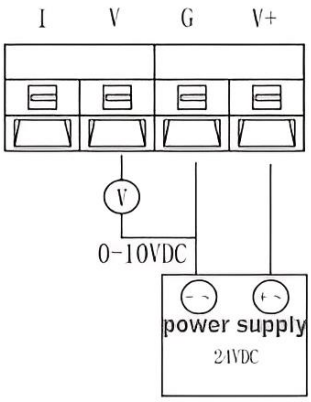
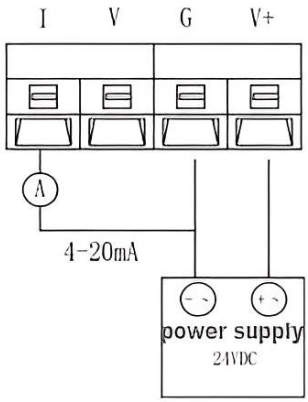
WIRING



Rs485 Output

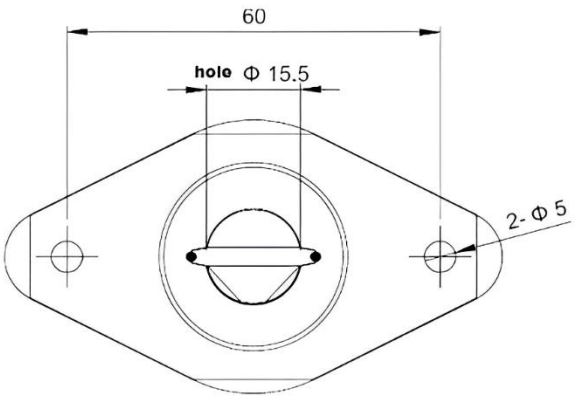


Voltage Output

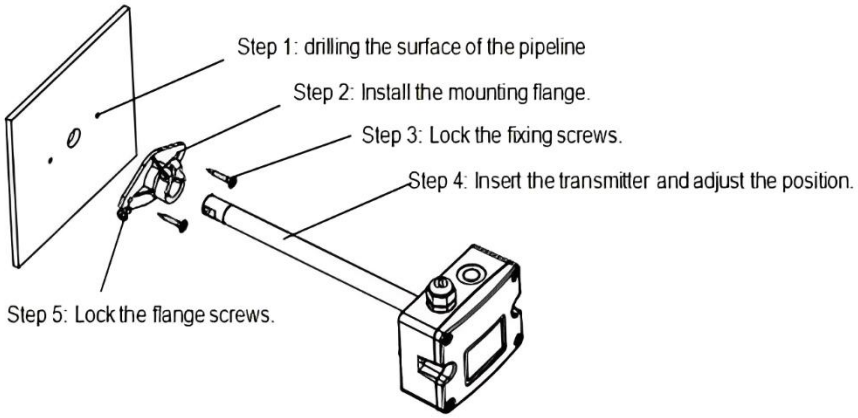


Current Output

INSTALLATION



Mounting Flange Size

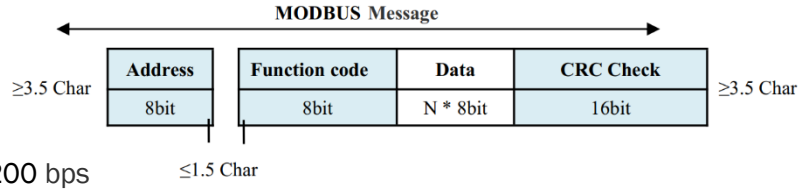


MODBUS RS485

This protocol operates in RS485 hardware for one-to-many control as well as signal collection under the standard of Modbus RTU.

1. **Character format**

Start: 1 Bit
Data: 8 Bit
Parity: None
Stop: 1 Bit
Baud Rate: 9600 bps, 19200 bps



In the RTU, two characters should be spaced out less than 1.5 characters of time; otherwise, this frame message would be considered as incomplete and be abandoned by receiver. 3.5 characters of time would be needed between two frame messages.

2. **Communication protocol**

a. Slave equipment ID address

Slave address is the identity for each equipment, The default value is 0x01 and could be altered from range 0x01~0xFF through communication. Among them, 0x00 would be broadcasting address, detailed as table (2.4).

b. Read Holding Registers (Function code 0x03)

Host equipment could read data from slave registers numbered in one or many through this function. Sequence format：

Host reading requests					
Slave ID address	Function code = 0x03	Starting Address	No. of Registers	CRC LO	CRC HI
8 Bit	8 Bit	16 Bit	16 Bit	8 Bit	8 Bit

Slave response sequence					
Slave ID address	Function code = 0x03	Data bytes n	Data	CRC LO	CRC HI
8 Bit	8 Bit	8 Bit	N * 8 Bit	8 Bit	8 Bit

Slave inaccurate response sequence				
Slave ID address	Function code = 0x03	Abnormal code = 0x02 or 0x03	CRC LO	CRC HI
8 Bit	8 Bit	8 Bit	8 Bit	8 Bit

Communication protocol example

Host dispatch sequence:	01	03	00 01	00 02	95 CB
	Slave ID	Function	Starting address	No. of Registers	CRC Check
Slave response sequence:	01	03	04	07 0A 41 4F	92 21
	Slave ID	Function	Byte Count	Data1 Data2	CRC Check
Slave inaccurate response sequence:	01	83	02	C0 F1	
	Slave ID	Function	Data length	CRC Check	

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c. Preset Single Register（Function code 0x06）

Host could input data to register and could only operate a register a time. Sequence format：

Host input requests for register sequence					
Slave ID address	Function code = 0x06	Register Address	Preset Data	CRC LO	CRC HI
8 Bit	8 Bit	16 Bit	16 Bit	8 Bit	8 Bit

Slave response sequence					
Slave ID address	Function code = 0x06	Register Address	Preset Data	CRC LO	CRC HI
8 Bit	8 Bit	16 Bit	16 Bit	8 Bit	8 Bit

Slave inaccurate response sequence				
Slave ID address	False code = 0x86	Abnormal code = 0x02 or 0x03	CRC LO	CRC HI
8 Bit	8 Bit	8 Bit	8 Bit	8 Bit

Communication protocol example

Host dispatch sequence:	01	06	00 03	00 01	B8 0A
	Slave ID	Function	Register address	Preset data	CRC Check
Slave response sequence:	01	06	00 03	00 01	B8 0A
	Slave ID	Function	Register address	Preset data	CRC Check

Slave inaccurate response sequence:	01	86	02	C3 A1
	Slave ID	Function	Data length	CRC Check

d. Broadcast preset register（Function code 0x06）

Host could input register data to all slaves of the bus with this function in the address 0x00. Slave no response. Sequence format：

Host spread broadcast to input register sequence					
Slave ID address 0x00	Function code = 0x06	Register Address	Preset Data	CRC LO	CRC HI
8 Bit	8 Bit	16 Bit	16 Bit	8 Bit	8 Bit
Slave no response					

Communication protocol example

Host dispatch sequence:	00	06	00 05	00 01	59 DA
	Slave ID	Function	Register address	Preset data	CRC Check

Note: The host could manipulate slaves' group and could modify slave ID address without knowing this slave ID address. Be careful assimilation of slave address through this function in case.

3. Register Address Table

Register address	Function	Read & write mode	Detail description
0x0001	Wind speed data	R	The wind speed data is four-byte single-precision floating-point data. For example, the current wind speed is 12.99 (decimal), 414FD70A (hexadecimal), and its transmission sequence is: D7 0A 41 4F
0x0004	Communication mode setting	R & W	1=9600bps, 2=19200bps Default:1
0x0005	Slave ID address setting	R & W	0x01~0xFF can be set, 0x00 is the broadcast receiving address. Default: 0x01

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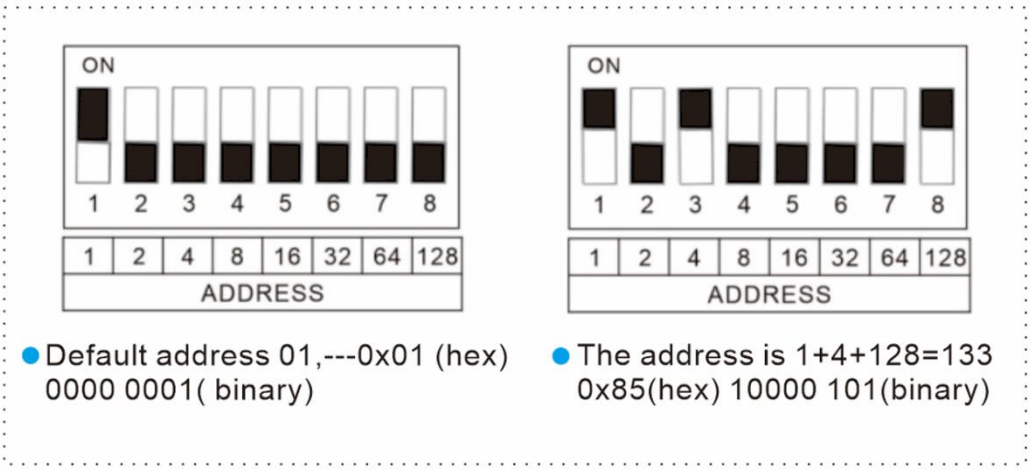
4. Analysis of Error Codes

0x02	Illegal register address
0x03	Illegal input data

DIP SWITCHES

The 8-digit DIP switch sets the slave address, the address can be set to 1-255, the factory default setting is 01, the setting method is as follows: dial to ON for 1, vice versa for 0, 1-8 digits on the dial panel represent low to high.



Note 1: To prevent product damage, it is recommended to adjust the DIP switch in the event of a power failure, and after changing the address using the DIP switch, it must be powered on again for the change to take effect.

Note 2: The address set by the DIP switch has the highest priority when modifying the slave address online, all DIP switches must be set to 0 to modify successfully, if necessary, the DIP switch is preferred to modify the address.

ADVISING NOTES

1. It is recommended to use flanges for the installation, by this way the depth can vary. Secure the mounting flange to the air duct with two screws, be careful with the flange screws, they can block the inserted probe. The opening of the duct is 15.5 mm. After installing the probe, the duct must be sealed to prevent air leakage.

2. When installing the air duct, pay special attention to the fact that the air inlet is consistent with the wind speed flow inside the duct, and the sensor is parallel to the wind speed flow.

3. Open the upper cover, connect the power wires, and signal wires into the bottom box through the waterproof connector, complete the wiring according to the wiring diagram, and install the upper cover back as it is. Pay attention to the sealing between waterproof joint and bottom box (with sealing ring) and the sealing between upper cover and bottom box (with sealing ring), so that the overall protection level can reach IP65.

4. Do not touch or rub the sensor probe, and do not use any mechanical tools to clean it.