SIEMENS

Duct temperature and humidity sensor:

– QFM9150/MO

Duct air quality sensor:

– QPM9152/MO

Modbus RTU (RS-485)

Basic Documentation

Table of Contents

1 About this document

1.1 Revision history

Edition	Date	Changes	Section
a	2022-12	First version.	All

1.2 Before you start

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Conventions for text marking

Markups

Special markups are indicated in the document as follows:

●	Numbered lists and instructions with an operation sequence
1. 2.	Procedures must be performed in the specified order.
[➜ X]	Reference to a page number

Symbol identifications

⚠ WARNING	
⚠	This is the symbol for hazard. It warns you of **Risks of injury.** Comply with all measures designated by this symbol to prevent injury or death.

NOTICE	
!	This symbol identifies an important notice that you should be aware of when you are using the product.

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2 Product overview

The sensors are used in ventilation and air conditioning plants.

2.1 Type summary

Product number	SSN no.	Measurement parameter			Output signal
		CO$_2$	Temperature	Relative humidity	
QFM9150/MO	S55720-S584	-	-40…70 °C	0…100 % r.h.	Modbus RTU
QPM9152/MO	S55720-S585	0…2000 ppm	-35…50 °C	0…100 % r.h.	Modbus RTU

2.2 Product documentation

Product number	Datasheet	Mounting instructions
QFM9150/MO	A6V13841476	A6V13795234
QPM9152/MO	A6V13855685	A6V13797617

See the datasheets and mounting instructions for detailed information. You can download the above documents at http://siemens.com/bt/download.

3 Wiring
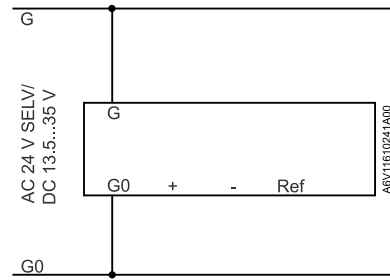
| G	Operating voltage AC 24 V ±20 % or DC 13.5...35 V
G0	GND
+	RS485 Modbus A
-	RS485 Modbus B
Ref	GND_ISO

4 Configurations

4.1 DIP switch for configuration method selection

The sensor is a Modbus RTU (RS-485) slave device. It can be configured with a Modbus master when DIP2-Position 7 is OFF (default setting).

The sensor has two sets of DIP switches: DIP1 and DIP2. It can be manually configured with DIP switches when DIP2-Position 7 is ON.

For details, see DIP switch configuration [→ 11].
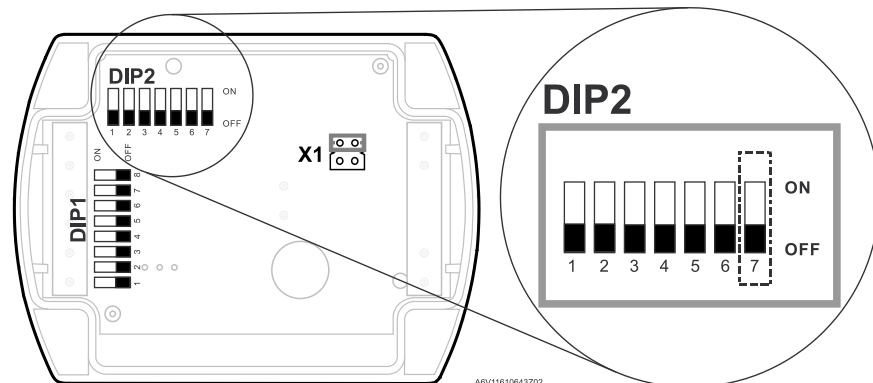
4.2 Modbus configuration parameters

	Name	Range/numeration	Default
Configurable	Modbus address	1...247	1
	Baud rate (bps)	0 = Auto 1 = 9600 2 = 19200 3 = 38400 4 = 57600 5 = 76800 6 = 115200	0
	Transmission format (start bits-data bits-parity-stop bits)	0 = 1-8-E-1 1 = 1-8-O-1 2 = 1-8-N-1 3 = 1-8-N-2	0
	Bus configuration command	0 = Ready 1 = Load 2 = Discard	0
Basic	Parity	Even Odd None	Even
	Stop bits	1 / 2	1
	Data	8 bits (0...255)	-
	Identity	Slave	-
	Cable length	< 600 m	-

NOTES:

- Register 764 (Modbus address) cannot be configured as 246 via a master. Address 246 is reserved for on-event addressing.
- Bus configuration command (768) is for on-event addressing only.

4.3 Modbus registers

Holding Register (16-bit) No.	Description	Range	Unit	Scaling	Default	R/W
1	Temperature value	-327…327 °C -556.6…620.6 °F	°C °F	0.01	-	R
2	Temperature reliability	0 – No error 1 – Bad reliability, unavailable	-	-	-	R
3	Relative humidity value	0…100 %	%	0.01	-	R
4	Humidity reliability	0 – No error 1 – Bad reliability, unavailable	-	-	-	R
5	CO_2 value	0…2000 ppm	ppm	-	-	R
6	CO_2 reliability	0 – No error 1 – Bad reliability, unavailable	-	-	-	R
7	IAQ value	0…100 %	%	0.01	-	R
8	IAQ reliability	0 – No error 1 – Bad reliability, unavailable	-	-	-	R
15	VOC value	0…100 %	%	0.01	-	R
16	VOC reliability	0 – No error 1 – Bad reliability, unavailable	-	-	-	R
212	VOC sensitive	0 – Slow 1 – Medium 2 - Fast	-	-	1	RW
223	Temperature offset	-100...100 °C -180...180 °F	°C °F	0.1	0	RW
224	Relative humidity offset	-100...100 %	%	0.1	0	RW
225	CO_2 offset	-2000...2000 ppm	ppm	1.0	0	RW
226	IAQ offset	-100...100 %	%	1.0	0	RW
227	VOC pure offset	-100...100 %	%	1.0	0	RW
401	System unit	0 – Celsius 1 – Fahrenheit others - invalid value to be discard	-	-	0	RW
1286	SW version: Major & Minor versions	-	-	-	-	R
1287	SW version: Build version	-	-	-	-	R
764	Modbus address	1…247	-	-	1	RW

Holding Register (16-bit) No.	Description	Range	Unit	Scaling	Default	R/W
765	Baud rate	0 = Auto 1 = 9600bps 2 = 19200bps 3 = 38400bps 4 = 57600bps 5 = 76800bps 6 = 115200bps	-	-	0	RW
766	Transmission format (start bits-data bits-parity-stop bits)	0 = 1-8-E-1 1 = 1-8-O-1 2 = 1-8-N-1 3 = 1-8-N-2	-	-	0	RW
767	Reserve	-	-	-	-	RW
768	Bus configuration command	0 = Ready 1 = Load 2 = Discard	-	-	0	RW

NOTES:

● The register number is counted from 1.

● 764 (Modbus address) cannot be configured as 246 via a master. Address 246 is reserved for on-event addressing.

● In the case of a multiple writing command from the master with invalid values, the sensor rejects the command with an error notice. The register values remain unchanged.

● Bus configuration command (768) is for on-event addressing only.

● Software version format: major version is 1 byte, minor version is 1 byte and build version is 2 bytes, such as [2.01.33] = 0x02010021.

4.4 LED colors and patterns

Color	Pattern	Description
Green	Constant until device boots	Power up
	Flashing (1 s on / 5 s off)	● Power-up is completed. ● Working properly ● Modbus is configured.
	Flickering	Bus communication
Orange	Flashing (1 s on / 5 s off)	Bus communication failure
	Flashing (1 s on / 1 s off)	● Power-up is completed. ● Working properly ● Modbus is not configured.
	Constant	Waiting configuration via Modbus in on-event addressing mode
Red	Flashing (0.1 s on / 1 s off)	Invalid parameter value received from master
	Flashing (1 s on / 5 s off)	Internal error: ● Sensing element malfunction ● Sensing element is not connected.

4.5 Push button configuration

When DIP2-Position 7 is OFF (default setting), push button function is activated.

Push button
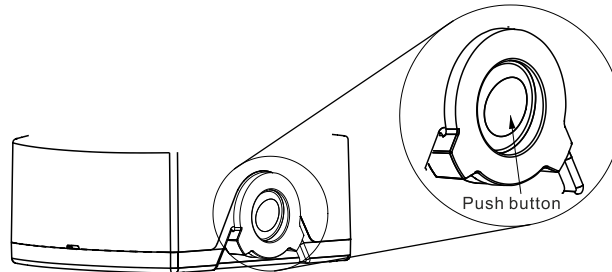
Push button

The following can be operated via push button:

● On-event addressing
● Resetting the Modbus parameters to factory default settings

4.5.1 On-event addressing (Climatix™ controllers configuration)

On-event addressing is a rapid configuration approach working together with Siemens Climatix™ controllers.

The sensor is wired and connected to the Climatix ™ controller via Modbus.

Enter addressing mode and configuration workflow via push button

Press the push button for	LED	Action	More details
1…5 s	Constant red	Press and hold the button	
5…10 s	LED off	Release the button	Entering the addressing mode, LED is constant orange. ● Address is set to 246 temporarily. ● Baud rate is set to Auto and then auto baud rate recognition is done. ● Format is set to 1-8-E-1 temporarily. Communication is established. ● Master writes the Modbus parameters. [1] ● Master writes "1" into register 4x0768 ("Bus configuration. command") to activate the change. After a successful pairing, the LED flashes green (1 s on / 5 s off). Otherwise the LED turns back to its original state. ● Time out after 30 s [2]
< 10 min	Constant orange in addressing mode	Press once and release the button	If the LED is constant orange, a short press of the push button stops and exits the on-event addressing mode. After exiting addressing mode, the LED turns back to its original state.

NOTES:

[1] The master cannot change the Modbus address (register 764) to 246.

[2] The interval between every configuration command for register 764…768 from Climatix™ is not more than 30 s. If it exceeds 30 s, the addressing mode ends automatically.

[3] 10-minute countdown starts from entering addressing mode.

4.5.2 Resetting Modbus parameters

Reset Modbus parameters to factory default settings

| Press the push button for	LED	Action	More details
1…5 s	Constant red	Press and hold the button	
5…10 s	LED off	Press and hold the button	
10…13 s	LED flashes orange	Release the button	Release the button while LED still flashes orange. LED keeps flashing orange for 3 s, then turns red for 1s. The reset to factory default 1) is completed. LED turns to permanent orange.
> 13 s	Returns to the initial status	Release the button	Release after 13 s, resetting is cancelled.

NOTE:

[1] Only Modbus address, baud rate and transmission format are reset to factory default.

4.6 DIP switch configuration

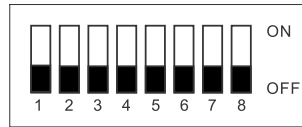The Modbus setting can be configured via DIP switches when DIP2-position 7 is ON.

NOTICE	
!	Modbus registers 764…768 are not writable via a master under DIP switches configuration.
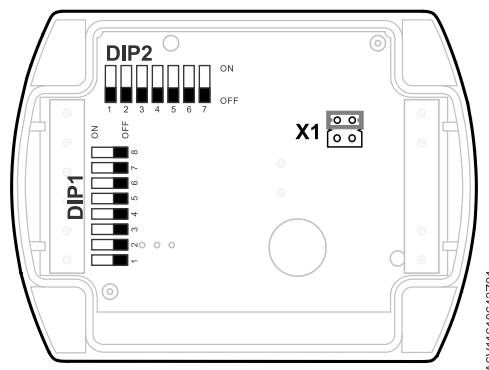
The sensor has two sets of DIP switches: DIP1 and DIP2.

DIP1
Address configuration

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	Address
1	2	3	4	5	6	7	8	
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0 (default)
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	1
OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	2
OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	3
OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	4
…	…	…	…	…	…	…	…	…
ON	ON	ON	ON	ON	ON	ON	ON	255

NOTES:

● Modbus address configuration: Valid address range 1…247, others = 0
● If an invalid address is set, the newly set values of register 764…768 are not activated. The registers keep the previous value.

DIP2
**Baud rate, transmission format, configuration**
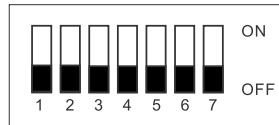
Baud rate			Parity		Stop bit [1]	Configuration	Function
1	2	3	4	5	6	7	
OFF	OFF	OFF					0 = Auto
OFF	OFF	ON					1 = 9600
OFF	ON	OFF					2 = 19200
OFF	ON	ON					3 = 38400
ON	OFF	OFF					4 = 57600
ON	OFF	ON					5 = 76800
ON	ON	OFF					6 = 115200
ON	ON	ON					others = Auto
			OFF	OFF			0 = Even (default)
			OFF	ON			1 = Odd
			ON	OFF			2 = No parity
			ON	ON			others = Even
					OFF		1 (default)
					ON		2
						OFF	Configurable via master or push button / on-event addressing
						ON	DIP switches

NOTE:
[1] Parity + Stop bit only support following combinations: 1-8-E-1, 1-8-O-1, 1-8-N-1 and 1-8-N-2. Others will be treated as 1-8-E-1.

4.7 Bus termination

Bus termination resistor
120 Ω (jumper)
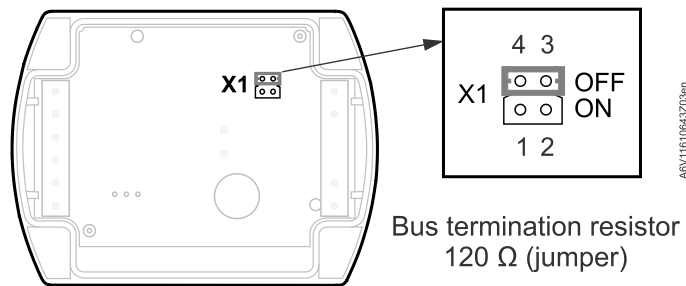
Jumper position descriptions:

●   Jumper position (OFF) = disable terminating resistor (factory setting)
●   Jumper position (ON) = enable terminating resistor

5 Maintenance

5.1 Disposal

	This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation. For additional details, refer to [Siemens information on disposal]().

6 Appendices

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https://www.siemens.com/cert/ => 'Siemens Security Advisories'

6.2 Regulatory compliance information

European Union conformity

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United Kingdom conformity assessed

Contact for regulatory topics: (GB) Siemens plc, Sir William Siemens House, Princess Road, Manchester, M20 2UR

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

● Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

● Consult the dealer or an experienced radio/TV technician for help.

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2. this device must accept any interference received, including interference that may cause undesired operation

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