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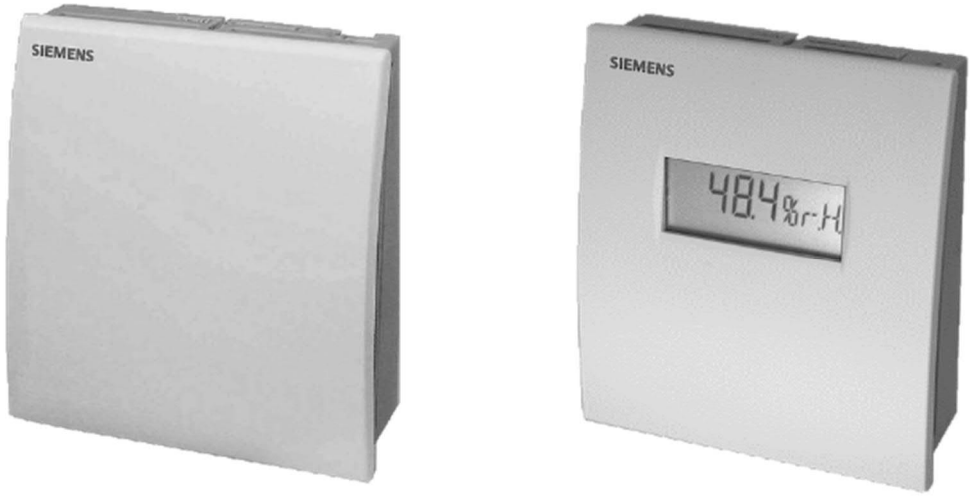

Room Humidity and Air Quality Sensors:

- QFA2050/MO, QFA2050D/MO
- QPA2052/MO

Modbus RTU (RS-485)

Basic Documentation

A6V12045847_en--_a

Smart Infrastructure

2020-07-23

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1 About this document

1.1 Revision history

Edition	Date	Changes	Section
a	2020-07	First version.	All

1.2 Before you start

Copyright

Quality assurance

These documents were prepared with great care.

- The content of all documents is checked at regular intervals.
- All necessary corrections are included in subsequent versions.
- Documents are automatically amended as a consequence of modifications and corrections to the products described.

Please ensure that you have the latest document revision.

If you have any questions or suggestions about this document, or if you have any criticisms or suggestions, please contact your local point of contact (POC) at the nearest branch office. Addresses for Siemens RCs are available at www.siemens.com/sbt.

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

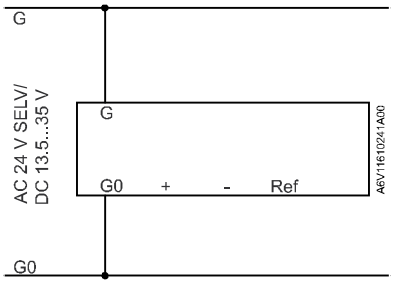
Product number	SSN No.	Measurement parameter			Output signal
		CO_2	Temperature	Relative humidity	
QFA2050/MO	S55720-S508	-	-40...70 °C	0…100 % r.h.	Modbus RTU
QFA2050D/MO	S55720-S509	-	-40…70 °C	0…100 % r.h.	Modbus RTU
QPA2052/MO	S55720-S510	0…2000 ppm	-40…70 °C	0…100 % r.h.	Modbus RTU

2.2 Product documentation

Product number	Datasheet	Mounting instructions
QFA2050/MO, QFA2050D/MO	A6V12046135	A6V12031740
QPA2052/MO	A6V12046144	A6V12031740

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

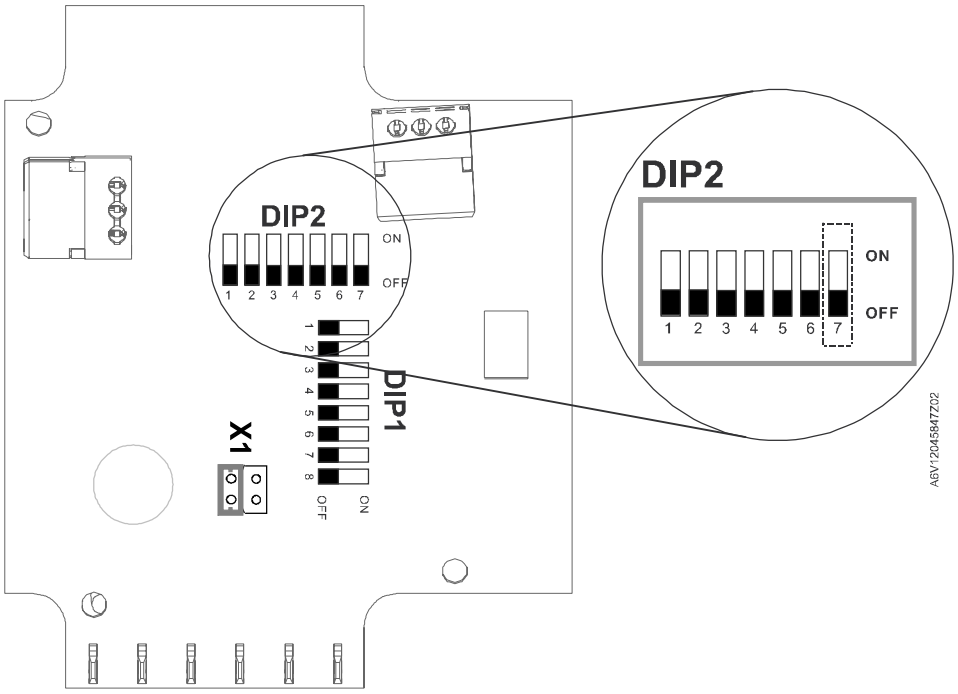
4 Configuration

4.1 DIP switch to configure method selection

The sensor is a Modbus RTU (RS-485) slave device and 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 and can be manually configured with DIP switches when DIP2-Position 7 is ON.

For details, see DIP switch configuration [→ 9].



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
Basic	Parity	Even Odd None	Even
	Stop bits	1 / 2	1
	Data	8 bits (0…255)	-

	Name	Range/numeration	Default
	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.

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
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	CO2 offset	-2000...2000 ppm	ppm	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
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

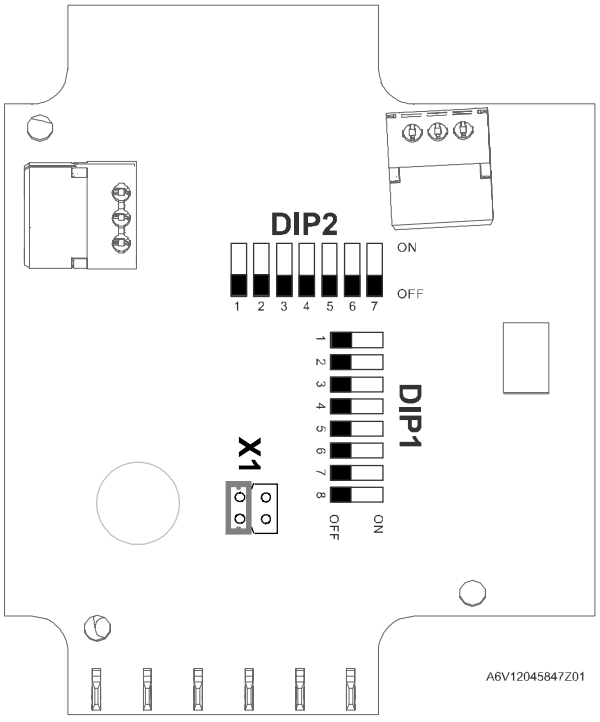
NOTES:

- The register number starts at 1.
- The sensor rejects a command with an error notice in the event of a multiple-writing command from the master with invalid values. The register values remain unchanged.
- 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.
- Supports only the holding register.

4.4 DIP switch configuration

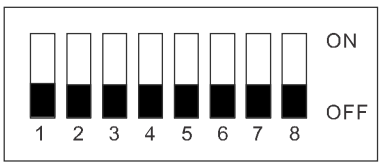
The Modbus setting can be configured via DIP switches (DIP2-position 7 must be set to ON).

!	*NOTICE*
	• Modbus registers 764…766 are not writable via a master under DIP switches configuration. • When DIP1-position 1...8 are set to 255 and DIP2-position 7 is ON, Modbus parameters are reset to factory default settings: Only Modbus address, baud rate and transmission format are reset to factory default.



The sensor has two sets of DIP switches: DIP1 and DIP2.

DIP1
Address configuration

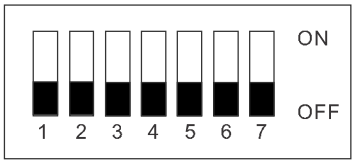


2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	Address
1	2	3	4	5	6	7	8	
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0 (default)
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	1
OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	2
OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	3
OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	4
…	…	…	…	…	…	…	…	…
ON	ON	ON	ON	ON	ON	ON	ON	255

NOTES:

- Modbus address configuration: Valid address range 1…247, others = 0
- Newly set values of register 764…766 are not activated for an invalid address; the registers retain the previous value.

DIP2
Baud rate, transmission format, configuration

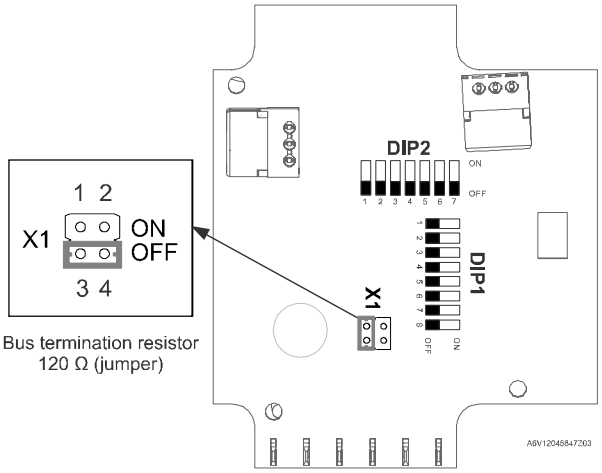


Baud rate			Parity		Stop bit [1]	Configuration	Function
1	2	3	4	5	6	7	
OFF	OFF	OFF					0 = Auto
OFF	OFF	ON					1 = 9600
OFF	ON	OFF					2 = 19200
OFF	ON	ON					3 = 38400
ON	OFF	OFF					4 = 57600
ON	OFF	ON					5 = 76800
ON	ON	OFF					6 = 115200
ON	ON	ON					others = Auto
			OFF	OFF			0 = Even (default)
			OFF	ON			1 = Odd
			ON	OFF			2 = No parity
			ON	ON			others = Even
					OFF		1 (default)
					ON		2
						OFF	Configurable via master
						ON	DIP switches

NOTE:

[1] Parity + Stop bit only support the 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.

4.5 Bus termination



Jumper position descriptions:

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

5 Maintenance

5.1 Disposal

	The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage. • Dispose of the device through channels provided for this purpose. • Comply with all local and currently applicable laws and regulations.

6 Appendices

6.1 Cyber security disclaimer

Siemens provides a portfolio of products, solutions, systems and services that includes security functions that support the secure operation of plants, systems, machines and networks. In the field of Building Technologies, this includes building automation and control, fire safety, security management as well as physical security systems.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art security concept. Siemens' portfolio only forms one element of such a concept.

You are responsible for preventing unauthorized access to your plants, systems, machines and networks which should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place. Additionally, Siemens' guidance on appropriate security measures should be taken into account. For additional information, please contact your Siemens sales representative or visit https://www.siemens.com/global/en/home/company/topic-areas/future-of-manufacturing/industrial-security.html.

Siemens' portfolio undergoes continuous development to make it more secure. Siemens strongly recommends that updates are applied as soon as they are available and that the latest versions are used. Use of versions that are no longer supported, and failure to apply the latest updates may increase your exposure to cyber threats. Siemens strongly recommends to comply with security advisories on the latest security threats, patches and other related measures, published, among others, under https://www.siemens.com/cert/en/cert-security-advisories.htm.

6.2 FCC

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference;
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 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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