Modbus Datapoint Table
Fume Cupboard Controller iCM500

1   Modbus General Information

1.1   Register Types

The Modbus specification supports multiple register types. Most SCHNEIDER devices use the *Holding Register* and *Input Register* types. Every holding register can store a 16-bit word (for example, an integer value between 0 and 65535). This value can be read using function code 03 ("Read Holding Registers") and can be modified using function code 06 ("Write Single Register") as well as function code 16 ("Write Multiple Registers").

The second important register type is the *Input Register*. Input registers are read-only and cannot be modified by a client. They represent the current state or a measurement from the device, and can be read using function code 04 ("Read Input Registers").

1.2   Data Types

1.2.1   Scaled Integers

The interpretation of a register value is not defined by Modbus itself but must be determined using the data point table. Where possible, integer values are used—sometimes with a scaling factor—to fit them into the range of 0 to 65535. For example, most volumetric flow rates in m^3/h can be accurately represented using such an integer without any loss of resolution. In contrast, storing a face velocity in m/s without a scaling factor is impractical because these values are typically between 0 m/s and 1 m/s. In this case, a scaling factor of *0.001* applied to a register value of, for example, *526* yields

$$0.001\,m/s \times 526 = 0.526\,m/s.$$

1.2.2   Enumerations

Some values are not continuous but represent discrete states. For each possible value, a predetermined meaning is assigned. The range of values and their corresponding meanings are described in the Descriptions section.

1.2.3   Text

Modbus does not natively support text. However, it is common practice to represent text by encoding two ASCII characters per register and using consecutive registers for longer texts. Since this method is not very efficient, it is used sparingly. For example, Input Registers 1 through 3 encode the firmware version, providing enough space for six ASCII characters.

2   Modbus Data Point Table

Type	Index	Name	Resolution	Unit	Description
Holding Register	0	Light	1		(3.36)
Holding Register	1	Night Mode Local	1		(3.2)
Holding Register	2	Override Mode Local	1		(3.3)
Holding Register	3	Off Mode Local	1		(3.4)
Holding Register	4	Night Mode Permanent	1		(3.5)
Holding Register	5	Override Mode Permanent	1		(3.6)
Holding Register	6	Off Mode Permanent	1		(3.7)
Holding Register	7	Button Quit Pressed	1		(3.8)
Holding Register	8	Button Light Pressed	1		(3.9)
Holding Register	9	Button On/Off Pressed	1		(3.10)
Holding Register	10	Setpoint Relay 1	1		(3.11)
Holding Register	11	Setpoint Relay 2	1		(3.12)
Holding Register	12	Setpoint Analog Output	0.001	V	(3.13)
Holding Register	13	Setpoint Damper	1	%	(3.14)
Holding Register	14	Operating Mode Forced	1		(3.15)
Holding Register	15	Open Sash Request	1		(3.16)
Holding Register	16	Close Sash Request	1		(3.17)
Input Register	0	Device Type	1		(3.18)
Input Register	1	Version (1/3)	1		(3.19)
Input Register	2	Version (2/2)	1		(3.20)
Input Register	3	Version (3/3)	1		(3.21)
Input Register	4	Alarms and Warnings	1		(3.22)
Input Register	5	Total Current [2/2]	45.51039912620034	Day	(3.23)
Input Register	6	Total Current [1/2]	1	min	(3.24)
Input Register	7	Face Velocity	0.01	m/s	(3.25)

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Type	Index	Name	Resolution	Unit	Description
Input Register	8	Volume Flow	1	m³/h	(3.26)
Input Register	9	Pressure Volume Flow	0.1	Pa	(3.27)
Input Register	10	Actuator Position	1	%	(3.28)
Input Register	11	Position	1	%	(3.29)
Input Register	12	Sash State	1		(3.30)
Input Register	13	DIN 1 Value	1		(3.31)
Input Register	14	DIN 2 Value	1		(3.32)
Input Register	15	Relay 1 State	1		(3.33)
Input Register	16	Relay 2 State	1		(3.34)
Input Register	17	Analog Output	0.001	V	(3.35)
Input Register	18	Light	1		(3.36)
Input Register	19	Alarm	1		(3.37)
Input Register	20	Buzzer	1		(3.38)
Input Register	21	Operating Mode	1		(3.39)
Input Register	22	Day Mode	1		(3.40)
Input Register	23	Night Mode	1		(3.41)
Input Register	24	Override Mode	1		(3.42)
Input Register	25	Off Mode	1		(3.43)
Input Register	26	Runtime Current [2/2]	45.51039912620034	Day	(3.44)
Input Register	27	Runtime Current [1/2]	1	min	(3.45)
Input Register	28	Air Controller Type	1		(3.46)
		End of Table			

3   Descriptions

3.1   Light (Holding Register 0)

Returns true if the fume cupboard light is enabled. Writing to this register has the same priority as pressing a button locally.

3.2   Night Mode Local (Holding Register 1)

Returns true if Night-mode is requested locally. Writing to this register has the same priority as pressing a button locally.

3.3   Override Mode Local (Holding Register 2)

Returns true if Override-mode is requested locally. Writing to this register has the same priority as pressing a button locally.

3.4   Off Mode Local (Holding Register 3)

Returns true if Off-mode is requested locally. Writing to this register has the same priority as pressing a button locally.

3.5   Night Mode Permanent (Holding Register 4)

If set to true, a prioritized request for Night-mode is issued.

3.6   Override Mode Permanent (Holding Register 5)

If set to true, a prioritized request for Override-mode is issued.

3.7   Off Mode Permanent (Holding Register 6)

If set to true, a prioritized request for Off-mode is issued.

3.8   Button Quit Pressed (Holding Register 7)

Automatically reset to false after true has been read. Writing this register has the same effect as pressing the quit button a function display.

3.9   Button Light Pressed (Holding Register 8)

Automatically reset to false after true has been read. Writing this register has the same effect as pressing the light button a function display.

3.10   Button On/Off Pressed (Holding Register 9)

Automatically reset to false after true has been read. Writing this register has the same effect as pressing the On/Off button a function display.

3.11   Setpoint Relay 1 (Holding Register 10)

Directly sets digital output. Only available if Relay is configured to use "Modbus" as its source.

3.12   Setpoint Relay 2 (Holding Register 11)

Directly sets digital output. Only available if Relay is configured to use "Modbus" as its source.

3.13   Setpoint Analog Output (Holding Register 12)

Directly sets the analog output. Only available if the analog output is configured to use "Modbus" as its source.

3.14   Setpoint Damper (Holding Register 13)

Directly sets the damper position. Only available if the damper mode is set the "Modbus" for the current Operating Mode.

3.15   Operating Mode Forced (Holding Register 14)

Forces the Operating Mode. Overrides request from all other sources.

Value Range
0: None No operating mode forced.
1: Day
2: Night
3: Override
4: Off

3.16 Open Sash Request (Holding Register 15)

Writing this register generates an sash opened button press event. Automatically resets to 0 after end of button press event.

3.17 Close Sash Request (Holding Register 16)

Writing this register generates an sash close button press event. Automatically resets to 0 after end of button press event.

3.18 Device Type (Input Register 0)

Shows the device type ID.

3.19 Version (1/3) (Input Register 1)

The three Version Input Register show each two ASCII encoded characters of the Firmware Version.

3.20 Version (2/2) (Input Register 2)

The three Version Input Register show each two ASCII encoded characters of the Firmware Version.

3.21 Version (3/3) (Input Register 3)

The three Version Input Register show each two ASCII encoded characters of the Firmware Version.

3.22 Alarms and Warnings (Input Register 4)

Number of active Notification with priority 'Warning' or 'Alarm'.

3.23 Total Current [2/2] (Input Register 5)

'Runtime Total [2/2]' x 65536 + 'Total Runtime [1/2]' shows the total runtime of the device.

3.24 Total Current [1/2] (Input Register 6)

'Runtime Total [2/2]' x 65536 + 'Total Runtime [1/2]' shows the total runtime of the device.

3.25   Face Velocity (Input Register 7)

The current face velocity, measured with the connected airflow sensor.

3.26   Volume Flow (Input Register 8)

The current volume flow, determined from the current differential pressure.

3.27   Pressure Volume Flow (Input Register 9)

The current differential pressure.

3.28   Actuator Position (Input Register 10)

The current actuator position in %.

3.29   Position (Input Register 11)

The current sash position in percent, measured with the connected position sensor.

3.30   Sash State (Input Register 12)

The current sash state.

Value Range
0: Unknown   The position sensor is not calibrated or the configuration is incorrect.
1: Not Connected   The position sensor is not connected.
2: Broken   The position sensor is outside the calibrated range, the cable may have broken.
3: Closed   The sash is completely closed.
4: Below Working Height   The sash is not closed, but below working height.
5: Working Height   The sash is at working height.
6: Above Working Height   The sash is above working height.

3.31   DIN 1 Value (Input Register 13)

The current the state of the digital input.

3.32   DIN 2 Value (Input Register 14)

The current the state of the digital input.

3.33   Relay 1 State (Input Register 15)

The current state of the relay.

3.34   Relay 2 State (Input Register 16)

The current state of the relay.

3.35   Analog Output (Input Register 17)

The current voltage on the analog output.

3.36   Light (Input Register 18)

The current status of the fume cupboard light relay (On or Off).

3.37   Alarm (Input Register 19)

The current alarm state of the device (Active or Inactive).

3.38   Buzzer (Input Register 20)

Current state ot the buzzer (aktive or inactive)

3.39   Operating Mode (Input Register 21)

The current operating mode (Day, Night, Override, Off).

Value Range
0: Day
1: Night
2: Override
3: Off

3.40   Day Mode (Input Register 22)

Shows if the operating mode is in day mode.

3.41   Night Mode (Input Register 23)

Shows if the operating mode is in night mode.

3.42   Override Mode (Input Register 24)

Shows if the operating mode is in override mode.

3.43   Off Mode (Input Register 25)

Shows if the operating mode is in off mode.

3.44   Runtime Current [2/2] (Input Register 26)

'Runtime Current [2/2]' x 65536 + 'Runtime Current [1/2]' shows the current uptime since the last reboot.

3.45   Runtime Current [1/2] (Input Register 27)

'Runtime Current [2/2]' x 65536 + 'Runtime Current [1/2]' shows the current uptime since the last reboot.

3.46   Air Controller Type (Input Register 28)

Shows the air controller type of the device.

The information and data contained in this documentation have been compiled to the best of our knowledge and in accordance with the current state of the art (subject to technical changes). The currently valid version applies. The proven properties of SCHNEIDER products are based on the use of the products recommended in this documentation. Diverging situations and individual cases are not taken into account, so that we cannot assume any warranty and liability.

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Do you have any questions? We look forward to your message:

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