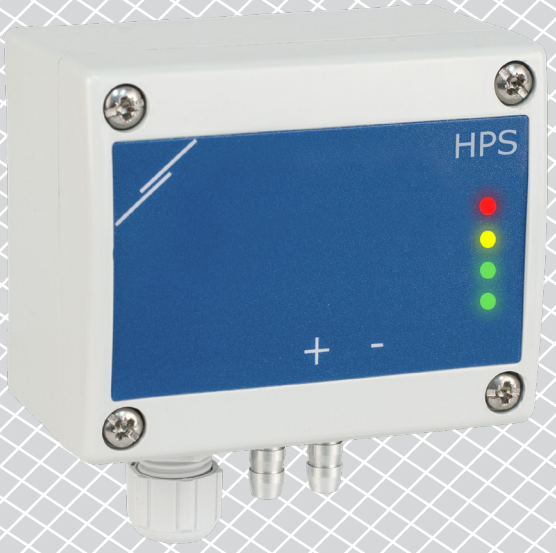
HPSPX-LP | DIFFERENTIAL PRESSURE PI CONTROLLER

Modbus register map



MODBUS REGISTER MAP

INPUT REGISTERS

		Data type	Description	Raw data range	Values
1	Differential pressure	signed integer	Measured differential pressure	-1.250—1.250	100 = 10,0 Pa
2			Reserved, returns 0		
3	Volume flow rate low	unsigned integer	Air Volume flow rate in m^3/h. The value in this registers is equal to the K-factor (holding register 62) of the motor / fan multiplied by square root of measured differential pressure. If K-factor is not known, volume flow rate is calculated from a duct cross sectional area (holding register 63) multiplied by air flow velocity (Pitot air velocity (holding register 64) should be enabled and Pitot tube connected)	0— 5.000	1.000 = 1.000 m^3/h
4	Air velocity	unsigned integer	Measured air velocity. **Active only if holding register 64 is set to 1**	0—150	100 = 10,0 m/s
5	Output	unsigned integer	Output value in percentage	0—1.000	100 = 10,0 %
6			Reserved, returns 0		
7	Calculated maximum of volume flow rate	unsigned integer	The maximum possible volume flow rate calculated from according to selected K factor or a duct cross sectional area	0—5.000	1.000 = 1.000 m^3/h
8	Air pressure/ volume/velocity span flag	unsigned integer	Flag indicates that measured air pressure, volume or velocity is outside set setpoint span values. Set to '1' when the measured value is outside the pressure, volume or velocity setpoint span values set defined by holding registers 13, 14, 20, 21, 22, 23, 28 and 29. Inactive during Auto-Tune function is in progress	0—1	0 = Pressure/Volume/Velocity setpoint inside alarm range 1 = Pressure/Volume/Velocity setpoint out of alarm range
9	Air pressure/ volume/velocity alarm flag	unsigned integer	Flag indicates that measured air pressure, volume or velocity is outside set setpoint alarm values. Set to '1' when the measured value is outside the pressure, volume or velocity setpoint alarm values set defined by holding registers 11, 12, 16, 17, 18, 19, 26 and 27. Inactive during Auto-Tune function is in progress	0—1	0 = Pressure/Volume/Velocity setpoint inside alarm range 1 = Pressure/Volume/Velocity setpoint out of alarm range
10	Feedback lost	unsigned integer	Indicates differential pressure feedback lost	0—1	0 = Pressure Feedback OK 1 = Pressure Feedback Lost (Red LED flashing)
11	Sensor fault	unsigned integer	Indicates a failure in pressure sensor element	0—1	0 = Sensor OK 1 = Sensor Fault (Red LED flashing)
12—20			Reserved, return 0		

Note: The input registers can be read via the Modbus command: “Read input registers”.

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
1	Device slave address	unsigned integer	Modbus device address	1—247		1
2	Modbus baud rate	unsigned integer	Modbus communication baud rate	0—6	0 = 4.800 1 = 9.600 2 = 19.200 3 = 38.400 4 = 57.600 5 = 115.200 6 = 230.400	2
3	Modbus parity check	unsigned integer	Parity check mode	0 = 8N1 1 = 8E1 2 = 8O1	0 = None 1 = Even 2 = Odd	1
4	Device type	unsigned integer	Device type. Read only	1707—1708	HPSPG-LP = 1707 HPSPF-LP = 1708	
5	HW version	unsigned integer	Hardware version of the device. Read only	XXXX	0x0100 = HW version 1.00	
6	FW version	unsigned integer	Firmware version of the device. Read only	XXXX	0x0200 = FW version 2.00	
7			Reserved, returns 0			
8	Modbus timeout	unsigned integer	After time with no Modbus communication, all outputs SET to 0 Not implemented (reserved) in -M versions	0—60	0 = no timeout 1 = 1 minute, ...	0
9	Modbus network resistor termination (NBT)	unsigned integer	Sets device as end device of the line / or not by connecting NBT	0—1	0 = NBT disconnected 1 = NBT connected	0
10	Modbus registers reset	unsigned integer	Resets Modbus Holding registers to default values. When finished this register is automatically reset to '0'	0—1	0 = Idle 1 = Reset Modbus Registers	0
11	Minimum pressure setpoint alarm	signed integer	Minimum pressure setpoint alarm, cannot be set higher than differential Pressure setpoint	-1250—Differential Pressure span minimum	100 = 10,0 Pa	0
12	Maximum pressure setpoint alarm	signed integer	Maximum pressure setpoint alarm, cannot be set lower than differential Pressure setpoint	Differential Pressure span maximum—1250	100 = 10,0 Pa	1250

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
13	Minimum pressure setpoint span	signed integer	Minimum pressure setpoint span, cannot be set higher than differential Pressure setpoint	-1250—Differential Pressure setpoint	100 = 10,0 Pa	0
14	Maximum pressure setpoint span	signed integer	Maximum pressure setpoint span, cannot be set lower than differential Pressure setpoint	Differential Pressure setpoint—1250	100 = 10,0 Pa	1250
15	Differential Pressure setpoint	signed integer	Setpoint - Desired differential pressure	-1250 — 1250	100 = 10,0 Pa	0
16			Reserved, returns 0			
17	Minimum Volume Flow Rate setpoint alarm	unsigned integer	Minimum volume flow setpoint alarm, cannot be set higher than Volume flow setpoint	0—Volume flow span minimum	1.000 = 1.000 m^3/h	0
18			Reserved, returns 0			
19	Maximum Volume Flow Rate setpoint alarm	unsigned integer	Maximum volume flow setpoint alarm, cannot be set lower than Volume flow setpoint	Volume flow span maximum —5.000	1.000 = 1.000 m^3/h	5.000
20			Reserved, returns 0			
21	Minimum Volume Flow Rate setpoint span	unsigned integer	Minimum volume flow setpoint span, cannot be set higher than Volume flow setpoint	0—Volume flow setpoint	1.000 = 1.000 m^3/h	0
22			Reserved, returns 0			
23	Maximum Volume Flow Rate setpoint span	unsigned integer	Maximum volume flow setpoint span, cannot be set lower than Volume flow setpoint	Volume flow setpoint—5.000	1.000 = 1.000 m^3/h	5.000
24			Reserved, returns 0			

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
25	Volume Flow Rate Set Point	unsigned integer	Set Point - Desired Volume Flow Rate.	0—5.000	1.000 = 1.000 m³/h	0
26	Minimum air velocity setpoint alarm	unsigned integer	Minimum pressure setpoint alarm, cannot be set higher than Air Velocity setpoint	0—Air Velocity span minimum	100 = 10,0 m/s	0
27	Maximum air velocity setpoint alarm	unsigned integer	Maximum pressure setpoint alarm, cannot be set lower than Air Velocity setpoint	Air Velocity span maximum	100 = 10,0 m/s	150
28	Minimum air velocity setpoint span	unsigned integer	Minimum pressure setpoint span, cannot be set higher than Air Velocity setpoint	0—Air Velocity setpoint	100 = 10,0 m/s	0
29	Maximum air velocity setpoint span	unsigned integer	Maximum pressure setpoint span, cannot be set lower than Air Velocity setpoint	Air Velocity setpoint—150	100 = 10,0 m/s	150
30	Air Velocity setpoint	unsigned integer	Set-Point - desired Air velocity	0—150	100 = 10,0 m/s	0
31—50			Reserved, return 0			
51	Output type	unsigned integer	Select analogue / digital output type	1—3	1 = 0—10 VDC 2 = 0—20 mA 3 = PWM	1
52	Overwrite enable / disable	unsigned integer	Enables the direct control over output 1	0—1	0 = Disabled 1 = Enabled	0
53	Overwrite value	unsigned integer	Overwrite value for output 1. Active only if Holding register 52 is set to 1	0 —1.000	0 = 0 % 1.000 = 100 %	0
54	Internal voltage source selection	unsigned integer	Selection of internal voltage source for PWM output	0—1	0 = 3,3 VDC 1 = 12 VDC	0
55	Minimum Output Value	unsigned integer	Minimum speed of the motor (between 10 and 50 %)	100 — 500	100 = 10 %	200

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
56	Maximum Output Value	unsigned integer	Maximum speed of the motor (between 50 and 100 %)	500—1.000	500 = 50 %	1.000
57	Kp	unsigned integer	Proportional Gain	1—30		5
58	Ti	unsigned integer	Integration Period	0—1.000	10 = 10*100 ms = 1s	40
59	Auto-Tune Function Start	unsigned integer	Starting Auto -Tune function Once started cannot be aborted	0—1	0 = Function is not active 1 = Function is in progress	0
60			Reserved, returns 0			
61	Operating Mode Selection	unsigned integer	Selection of Operating Mode	0—3	0 = OFF 1 = Pressure 2 = Volume flow 3 = Air velocity	1
62	K-factor	unsigned integer	K factor according to the motor / fan specification	0—1.000		0
63	Duct cross sectional area [cm2]	unsigned integer	Used for calculation of the Volume Flow Rate when K-factor is not known	0—32.000	0 = not used 1 = 32.000 (100 = 100 cm^2)	0
64	Pitot air velocity	unsigned integer	Enables Air Velocity Readout. If '0' air velocity readout is disabled, if '1' air velocity readout is enabled and it is accessible in input register 4. Pitot tube needed (PSET-PTX-200)	0—1	0 = Disabled 1 = Enabled	0
65—69			Reserved, return 0			
70	Recalibrate sensor	unsigned integer	Recalibrate sensor	0—1	0 = Inactive 1 = Active	0
71—91			Reserved, return 0			

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
91	Measurement readout	unsigned integer	4-digit measurement indication ON / OFF	0—1	0 = LED is OFF 1 = LED is ON	1
92	Altitude	unsigned integer	Current altitude	0—5.000	1.000 = 1.000 m	0
93	Start-up timer	unsigned integer	Start-up period before setting alarm and span flags. During this period the alarm and span limits are not compared with the measured pressure/volume/velocity and alarm flag and span limit flag registers will remain '0' for this period. Timer is reloaded when operating setpoint is set to 0 or auto-tune function is performed	0—1.000	100 = 100 s	60 s
94			Reserved, returns 0			
95	LED intensity / brightness	unsigned integer	LED intensity (incrementing with step of 10 %)	0—10	0 = OFF 1 = 10 % 10 = 100 %	5
96	Feedback lost output value	unsigned integer	Value for output 1 when feedback is lost	0—1.000	0 = 0 % 1.000 = 100 %	0
97	Feedback lost timer	unsigned integer	Output is equal to feedback lost output value when feedback is lost and feedback lost timer expired	0—600	10 = 1 s	30
98	Feedback lost enable	unsigned integer	Enable feedback lost functionality	0—1	0 = Disabled 1 = Enabled	0
99—100			Reserved, return 0			

Note: The holding registers can be managed via the following Modbus commands: "Read Holding Registers", "Write Single Register" or "Write Multiple Registers".

The free Sentera configuration and monitoring software 3SModbus can be downloaded via: *https://www.sentera.eu/en/3SMCenter*