English

Modbus Register Table
(User Version)

S461



S461 Modbus Register Table and Documentation

Addr.	Data type	Data Length	Description	Contents/ Example	R
System information					
2000	INT16U	2-Byte	Group ID		R
2001	INT16U	2-Byte	Device ID		R
2002	INT32U	4-Byte	Serial number		R
2004	INT16U	2-Byte	High byte FW ver, Low byte HW ver		R
2005	DOUBLE	8-Byte	Calibration date		R
2009	INT16U	2-Byte	Valid days from calibration date		R
2010	INT16U	2-Byte	Measuring Channel number	15	R
2011	String	16-Byte	Device name	”S461”	R
Unit+Resolution+Type information					
2200	INT16U	2-Byte	Flow		R
2201	INT16U	2-Byte	Velocity		R
2202	INT16U	2-Byte	Consumption (Forward)		R
2203	INT16U	2-Byte	Consumption (Reverse)	Flow meter only	R
2205	INT16U	2-Byte	Energy Flow (instant. energy)	Energy meter only	R
2206	INT16U	2-Byte	Heat accumulated	Energy meter only	R
2207	INT16U	2-Byte	Cold accumulated	Energy meter only	R
2208	INT16U	2-Byte	Delta T	Energy meter only	R
2209	INT16U	2-Byte	Temperature inlet	Energy meter only	R
2210	INT16U	2-Byte	Temperature outlet	Energy meter only	R
2211	INT16U	2-Byte	Signal strength Upstream		R
2212	INT16U	2-Byte	Signal strength Downstream		R
2213	INT16U	2-Byte	Signal quality		R
2214	INT16U	2-Byte	Measurement status (E, G, N)		R
2215	INT16U	2-Byte	Sound velocity ratio		R
Status and Channel value					
2300	INT16U	2-Byte	Status	Status	R
2301	Float	4-Byte	Flow	Value	R
2303	Float	4-Byte	Velocity		R
2305	Float	4-Byte	Consumption (Forward)		R
2307	Float	4-Byte	Consumption (Reverse)	Flow meter only	R
2311	Float	4-Byte	Energy Flow (instant. energy)	Energy meter only	R
2313	Float	4-Byte	Heat accumulated	Energy meter only	R

Addr.	Data type	Data Length	Description	Contents/ Example	R
2315	Float	4-Byte	Cold accumulated	Energy meter only	R
2317	Float	4-Byte	Delta T	Energy meter only	R
2319	Float	4-Byte	Temperature inlet	Energy meter only	R
2321	Float	4-Byte	Temperature outlet	Energy meter only	R
2323	Float	4-Byte	Signal strength Upstream		R
2325	Float	4-Byte	Signal strength Downstream		R
2327	INT32	4-Byte	Signal quality		R
2329	String	2-Byte	Measurement status (E, G, N)		R
2331	INT16U	2-Byte	Status	Status	R
2332	Float	4-Byte	Sound velocity ratio	Value	R

Explanation:

- Unit+Resolution+type

First byte is unit.

Channel	Unit	Coded unit (decimal)
Flow	m^3/h	14
	m^3/min	15
	l/min	16
	cfm	18
	cfs	83
	USG/min	143
	IG/min	144
	bbl/min	145
Velocity	m/s	10
	ft/min	11
Consumption	m^3	24
	l	25
	cf	26
	IG	148
	UG	146
	bbl	147
Energy Flow	GJ/h	133
	kcal/h	134
	MBtu/h	135
	KJ/h	136

	Btu/h	137
	kW	102
	MW	121
Energy	GJ	138
	kcal	139
	MBtu	140
	KJ	141
	Btu	142
	kWh	105
	MWh	122
Temperature	°C	1
	°F	2

Second byte is data type and resolution:

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Data type: 0 float, 1 4-byte unsigned integer 2 double				Resolution: 0 0 1 0.0 2 0.00 3 0.000 4 0.0000			

Resolution and units S461

Parameter	Unit	Resolution	Range	Remarks
Flow	m^3/h	0.1	0.1 ... 9999.9	
		1	10000 ... 99999	
	m^3/min	0.1	0.1 ... 9999.9	
		1	10000 ... 99999	
	l/min	0.1	0.1 ... 9999.9	
		1	10000 ... 99999	
	cfm	0.01	0.01 ... 999.99	
	cfs	0.1	0.1 ... 9999.9	
		1	10000 ... 99999	
	USG/min	0.1	0.1 ... 9999.9	
		1	10000 ... 99999	
	IG/min	0.1	0.1 ... 9999.9	
		1	10000 ... 99999	
	bbl/min	0.1	0.1 ... 9999.9	
		1	10000 ... 99999	

Velocity	m/s	0.01	0.01 ... 10.00	
	ft/min	1	1 ... 2000	
Consumption	m^3	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
	l	1	1 ... 9999999	
	cf	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
	IG	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
	UG	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
	bbl	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
Energy Flow	GJ/h	0.01	0.01 ... 999.99	
	kcal/h	1	1 ... 99999	
	MBtu/h	0.01	0.01 ... 999.99	
	KJ/h	1	1 ... 99999	
	Btu/h	1	1 ... 99999	
	kW	0.1	0.1 ... 9999.9	
	MW	0.001	0.001 ... 99.999	
Energy	GJ	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
	kcal	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
	MBtu	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
	KJ	0.1	0.1 ... 99999.9	
		1	100000 - 9999999	
	Btu	0.1	0.1 … 99999.9	
		1	100000 ... 9999999	
	kWh	0.1	99999.9	
		1	100000 ... 9999999	
	MWh	0.1	0.1 ... 99999.9	
		1	100000 ... 9999999	
Temperature	°C	0.1	-50.0 ... 200.0	
	°F	0.1	-50.0 ... 400.0	
Signal strength Upstream	–	0.1	0.1 ... 99.9	

Signal strength Downstream	_	0.1	0.1 ... 99.9	
Signal quality	_	1	1 ... 99	
Measurement status	_	_	E, G, N	'E', 'G', 'N' : ASCII code. E: Error G: Gain adjustment N: Normal
Sound velocity ratio	_	0.1	0.1 ... 99	

- Status

The highest bit is used for indicating if sensor setting is changed by user. The resting bits are used for indicating is following measuring change is OK not not. So every 15 measuring channels we have a status at top.

Bit15	Bit15: 0, sensor setting is never changed since last reading from master Bit15: 1, sensor setting is changed since last reading from master
Bit0 ... Bit14	Bit0: 0, the first following measuring channel is OK; 1, the first following measuring channel is NG. Bit1: 0, the second following measuring channel is OK; 1, the second following measuring channel is NG.

- Channel value

Channel value is arranged from channel1 to channel50 (Max), the length and data type is defined in section of Unit+Resolution+type. Maximum 50 channel is supported.

Channels of S461		
Sensor	**Group ID**	**Channels**
S461 Flow	2	Flow Velocity Consumption (Forward) Consumption (Reverse) Signal strength Upstream Signal strength Downstream Signal quality Measurement status (E, G, N) Sound velocity ratio
S461 Energy	2	Flow Velocity Consumption (Forward) Energy Flow (instantaneous energy) Heat accumulated Cold accumulated Delta T Temperature inlet Temperature outlet Signal strength Upstream Signal strength Downstream Signal quality Measurement status (E, G, N) Sound velocity ratio

Group IDs

Group ID	Description	Remarks
1	Gas Flow Sensor	S401/421, S450/452, S415/418, S430/431
2	Water Flow sensor	S461
3	Dew Point Sensor	S217-M, S215/211/220, S230/231
4	Oil Vapor Sensor	S120, S120-ambient
5	Particle Counter	S130, 132
6	Gas Purity Sensor	S150
7	Air quality sensor	S600, S601, S602
8	Power Meter	S110-V2
9	Temperature Sensor	
10	Pressure Sensor	
15	Others	

Multi-Byte data order

2-byte	4-byte	8-byte
Byte1 Byte0	Byte1 Byte0 Byte3 Byte2	Byte1 Byte0 Byte3 Byte2 Byte5 Byte4 Byte7 Byte6

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