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English

Modbus protocol

Wireless data logging system

HD35 series

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Keep for future reference.

In MODBUS communication the base unit works as a multiplexer (i.e., as an interface) to address MODBUS commands from PC/PLC to wireless network devices. That means that the address of a wireless device (for ex. a data logger) which is not physically connected to the RS485 (MODBUS-RTU) or LAN (MODBUS TCP/IP) network can be added to the MODBUS command: the base unit, physically connected to the RS485 or LAN network, will intercept the command and will send it to the interested wireless device. The wireless device will execute the command and reply to the base unit; this will send back the reply to the PC/PLC. In order for a wireless device to be addressed successfully, devices with the same MODBUS address as that of wireless devices should not be present in RS485 or LAN network.

The device general information can be read through the function code **0x2B/0x0E.** It consists of: manufacturer (Delta OHM), model and firmware version.

The complete list of MODBUS registers is shown below. According to the device model, some of the listed registers could not be present if not significant for that particular model (for ex., CO_2 measurement will not be available if it is not measured by the data logger). If you try to read a register that is not present, the instrument returns the fixed value 32767. In case of doubt on the registers actually available in a particular model, use the function " *Download the list of MODBUS registers of the device* " included in the *Settings* sections of HD35AP-S software (see software instructions).

The following conventions have been used in the tables:

- **AP** = base unit, **ED** = data logger, **RE** = repeater, **AL** = alarm module
  AP, ED, RE, AL columns indicate the device where the parameter is available.
- Type: **b** = bit, **B** = 8 bits (Byte), **W** = 16 bits without sign (Word), **SW** = 16 bits with sign
- **(x10)** = decimal value expressed as an integer (e.g., if the content of the register is 184, the value is to be intended as 18,4).
- **(x100)** = centesimal value expressed as an integer (e.g., if the content of the register is 500, the value is to be intended as 5,00).

The commands for requesting units of measurement return an index according to the correspondence indicated in the table below:

Indexes of the units of measurement

Index	Unit of meas.	Index	Unit of meas.	Index	Unit of meas.	Index	Unit of meas.	Index	Unit of meas.
0	°C	13	inchHg	26	J/m^2	39	inch	52	l/min
1	°F	14	$inchH_2O$	27	$\mu J/cm^2$	40	counts	53	gallon/min
2	%UR	15	kgf/cm^2	28	V	41	mm/h	54	m^3/min
3	g/m^3	16	PSI	29	mV	42	inch/h	55	m^3/h
4	g/kg	17	m/s	30	mA	43	counts/h	56	$\mu mol/(m^2s)$
5	mbar	18	km/h	31	ppm	44	mW/m^2	57	mm/day
6	bar	19	ft/s	32	Hz	45	m	58	kV
7	Pa	20	mph	33	%	46	s	59	A
8	hPa	21	knot	34	degrees	47	µW/lumen	60	kA
9	kPa	22	W/m^2	35	lux	48	dB	61	cm/s
10	atm	23	$\mu W/cm^2$	36	m^2/s	49	dBA	62	klux
11	mmHg	24	Wh/m^2	37	g (*)	50	kWh		
12	mmH_2O	25	kWh/m^2	38	mm	51	l/s	255	Undefined

(*) Gravity acceleration

DISCRETE INPUTS

Address	Type	Discrete Input description	AP	ED	RE	AL
0	b	If 1, the device is subjected to RF interference due to the transmission of more covering repeaters.		✓	✓	✓
1	b	If 1, the last transmitted measurement packet has been lost		✓		
2	b	Flag PENDING_CONF. If 1, there is a pending configuration change request.	✓	✓	✓	✓
3	b	If 1, there are more devices with the same Modbus address in the network. The conflict must be solved.	✓			
4	b	If 1, there is a RF scheduling problem. The set transmission interval is too short.		✓		✓
5	b	If 1, a network migration to another RF channel is in progress.	✓	✓	✓	✓
6	b	If 1, the device supports a rechargeable battery.	✓		✓	

COILS

Address	Type	Coil description	AP	ED	RE	AL
0	b	Waiting time after Modbus transmission: 0= immediate reception, 1=waiting time for 3.5 characters	✓			
1	b	Logging status: 0=active, 1=inactive		✓		
2	b	Logging mode: 0=non cyclic, 1=cyclic		✓		
3	b	Set 1 to delete the device logging memory. Bit zeroing is automatic.	✓	✓		
4	b	Buzzer activation (for AP and ED) or relays activation (for AL) in case of measurement alarm: 0=no, 1=yes	✓	✓		✓
5	b	If 1, there are unsaved device parameters in the flash memory. Set 0 to force storage.	✓			
6	b	If 1, there is a pending RF rescheduling (RF transmission sequence of devices). Set 0 to force rescheduling.	✓			
7	b	Flag CMD_FAILURE. If 1, at least a command sent to the device has failed. Set 0 to reinitialize the flag.	✓	✓	✓	✓
8	b	Buzzer activation in case of RF alarm: 0=no, 1=Yes	✓			
9	b	Protection of configuration with password: 0=no, 1=yes Changing the parameter requires the Administrator password (see Holding Register 10036).	✓			
13	b	Set 1 to reinitialize the counter in HD35EDH model with counter input. Bit zeroing is automatic.		✓		
14	b	If 1, some device parameters in the base unit could be not updated. Set 0 to force the update.		✓	✓	✓
15	b	CO_2 sensor autocalibration: 0=OFF, 1=ON		✓		
16	b	Relay #1 activation in case of measurement alarm: 0=no, 1=yes				✓
17	b	Relay #1 activation in case of RF alarm: 0=no, 1=yes				✓
18	b	If 1, relay #1 is always active as long as the alarm persists				✓
19	b	Relay #2 activation in case of measurement alarm: 0=no, 1=yes				✓
20	b	Relay #2 activation in case of RF alarm: 0=no, 1=yes				✓
21	b	If 1, relay #2 is always active as long as the alarm persists				✓
22	b	Wind speed when the measurement is below the minimum threshold of the sensors: 0=0 m/s, 1= threshold value in m/s		✓		

INPUT REGISTERS

Address	Type	Input Register description	AP	ED	RE	AL
Measured values and status of measurement alarms						
0	SW	**TEMPERATURE** with **NTC10K** sensor of channel **1** in the set measurement unit (x10).		✓		
1	B	Alarm for temperature with NTC10K sensor of channel 1: 0=OFF, 1= lower threshold alarm, 2= higher threshold alarm		✓		
2	SW	**RELATIVE HUMIDITY** in % (x10). Only for **models ...TC and ...TV**.		✓		
3	B	Relative humidity alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm. Only for models …TC and …TV.		✓		
4	SW	**DEW POINT** in the set measurement unit (x10).		✓		
5	B	Dew Point alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
6	SW	**PARTIAL VAPOR PRESSURE** in hPa (x100).		✓		
7	B	Partial vapor pressure alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
8	SW	**MIXING RATIO** in g/Kg (x10).		✓		
9	B	Mixing ratio alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
10	SW	**ABSOLUTE HUMIDITY** in g/m^3 (x10).		✓		
11	B	Absolute humidity alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
12	SW	**WET BULB TEMPERATURE** in the set measurement unit (x10).		✓		
13	B	Wet bulb temperature alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
16	SW	**TEMPERATURE** with **NTC10K** sensor of channel **2** in the set measurement unit (x10).		✓		
17	B	Alarm for temperature with NTC10K sensor of channel 2: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
18	SW	**SOLAR RADIATION** in W/m^2.		✓		
19	B	Alarm for solar radiation: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
20	SW	**ILLUMINANCE** in lux (low range, models HD35ED...I...).		✓		
21	B	Illuminance (low range, models HD35ED...I...) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
22	SW	**CO** in ppm.		✓		
23	B	CO alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
24	SW	**ATMOSPHERIC PRESSURE** in the set measurement unit (the multiplier depends on the set unit).		✓		
25	B	Atmospheric pressure alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
30	SW	**DAILY SOLAR RADIATION** in Wh/m^2.		✓		
31	B	Alarm for daily solar radiation: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
32	SW	**CO_2** in ppm.		✓		
33	B	CO_2 alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
34	SW	**SOIL VOLUMETRIC WATER CONTENT** (**VWC**) in % (x10).		✓		
35	B	Soil volumetric water content alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
36	SW	**VWC PROBE OUTPUT** in mV (x10).		✓		

Address	Type	Input Register description	AP	ED	RE	AL
37	B	VWC probe output alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
46	SW	**TEMPERATURE** with sensor integrated in RH module in the set measurement unit (x10). *Only for models …TVI and indoor models …B[V].*		✓		
47	B	Alarm for temperature with sensor integrated in RH module: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm. *Only for models …TVI and indoor models …B[V].*		✓		
48	SW	**RELATIVE HUMIDITY** in % (x10). *Only for models …TVI and indoor models …B[V].*		✓		
49	B	Relative humidity alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm. *Only for models …TVI and indoor models …B[V].*		✓		
50	SW	**TEMPERATURE** with **NTC10K** sensor of channel **3** in the set measurement unit (x10).		✓		
51	B	Alarm for temperature with NTC10K sensor of channel 3: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
56	SW	**DIFFERENTIAL PRESSURE** for the range **r3** in the set measurement unit (the multiplier depends on the set unit).		✓		
57	B	Differential pressure alarm for the range r3: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
60	SW	**DIFFERENTIAL PRESSURE** for ranges **r1** and **r2** in the set measurement unit (the multiplier depends on the set unit).		✓		
61	B	Differential pressure alarm for ranges r1 and r2: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
62	SW	**DIFFERENTIAL PRESSURE** for the range **r4** in the set measurement unit (the multiplier depends on the set unit).		✓		
63	B	Differential pressure alarm for the range r4: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
64	SW	**TEMPERATURE** with **Pt100 sensor** of HP3517E… probe in the set measurement unit (x10).		✓		
65	B	Alarm for temperature with Pt100 sensor of HP3517E… probe: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
66	SW	**PYRANOMETER OUTPUT** in mV (x100).		✓		
67	B	Pyranometer output alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
68	SW	**UVA IRRADIANCE** (low range) in mW/m^2.		✓		
69	B	UVA irradiance (low range) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
70	SW	**PROPORTION OF UV PRESENT** in µW/lumen.		✓		
71	B	Proportion of UV present alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
72	SW	**WET BULB TEMPERATURE** measured by the natural ventilation wet bulb probe, in the set measurement unit (x10).		✓		
73	B	Wet bulb temperature alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
74	SW	**GLOBE THERMOMETER TEMPERATURE** in the set measurement unit (x10).		✓		
75	B	Globe thermometer temperature alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
76	SW	**INDOOR WBGT INDEX** in the set measurement unit (x10).		✓		
77	B	Indoor WBGT index alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
78	SW	**OUTDOOR WBGT INDEX** in the set measurement unit (x10).		✓		
79	B	Outdoor WBGT index alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		

Address	Type	Input Register description	AP	ED	RE	AL
80	SW	**ILLUMINANCE** in lux (high range, models HD35ED...I2...).		✓		
81	B	Illuminance (high range, models HD35ED...I2...) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
82	SW	**WIND GUST** in m/s.		✓		
83	B	Wind gust alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
86	SW	**RAIN RATE** in counts/h.		✓		
87	B	Rain rate alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
88	SW	**DAILY RAIN** in counts.		✓		
89	B	Daily rain alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
92	SW	**WIND SPEED** (HD52.3D anemometer) in m/s (x100).		✓		
93	B	Wind speed (HD52.3D anemometer) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
94	SW	**WIND DIRECTION** (HD52.3D anemometer) in degrees (x10).		✓		
95	B	Wind direction (HD52.3D anemometer) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
96	SW	**MEAN KINETIC TEMPERATURE** of channel **1** in the set measurement unit (x10).		✓		
97	B	Alarm for mean kinetic temperature of channel 1: 0=OFF, 1= lower threshold alarm, 2= higher threshold alarm		✓		
98	SW	**MEAN KINETIC TEMPERATURE** of channel **2** in the set measurement unit (x10).		✓		
99	B	Alarm for mean kinetic temperature of channel 2: 0=OFF, 1= lower threshold alarm, 2= higher threshold alarm		✓		
100	SW	**MEAN KINETIC TEMPERATURE** of channel **3** in the set measurement unit (x10).		✓		
101	B	Alarm for mean kinetic temperature of channel 3: 0=OFF, 1= lower threshold alarm, 2= higher threshold alarm		✓		
102	SW	**STATE OF THE CONTACT INPUT**.		✓		
103	B	Contact input alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
104	SW	**FLOW** in l/s.		✓		
105	B	Flow (l/s) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
106	SW	**FLOW** in l/min.		✓		
107	B	Flow (l/min) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
108	SW	**FLOW** in m^3/min.		✓		
109	B	Flow (m^3/min) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
110	SW	**SOIL VOLUMETRIC WATER CONTENT** (**VWC**) in % (x10) – channel **2**.		✓		
111	B	Soil volumetric water content alarm – channel 2: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
112	SW	**VWC PROBE OUTPUT** in mV (x10) – channel **2**.		✓		
113	B	VWC probe output alarm – channel 2: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
114	SW	**SOIL VOLUMETRIC WATER CONTENT** (**VWC**) in % (x10) – channel **3**.		✓		
115	B	Soil volumetric water content alarm – channel 3: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
116	SW	**VWC PROBE OUTPUT** in mV (x10) – channel **3**.		✓		

Address	Type	Input Register description	AP	ED	RE	AL
117	B	VWC probe output alarm – channel 3: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
118	SW	**AIR SPEED** (HD404…SR transmitter) in m/s (x100).		✓		
119	B	Air speed (HD404…SR transmitter) alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
122	SW	**RAINFALL QUANTITY IN THE LAST HOUR** in counts.		✓		
123	B	Alarm for rainfall quantity in the last hour: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
126	SW	**WET BULB TEMPERATURE** calculated by HD35EDWWBGT, in the set measurement unit (x10).		✓		
127	B	Alarm for wet bulb temperature calculated by HD35EDWWBGT: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
128	SW	**POWER SUPPLY VOLTAGE** in V (x100).		✓		
129	B	Power supply voltage alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
130	SW	**AMOUNT OF RAIN** in counts.		✓		
131	B	Amount of rain alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
132	SW	**SUNSHINE DURATION SENSOR** - Sun presence: 0=SRD < 120 W/m^2, 1=SRD ≥ 120 W/m^2		✓		
133	B	Sunshine duration sensor – Sun presence alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
134	SW	**SUNSHINE DURATION SENSOR** - Number of seconds in the last minute with SRD ≥ 120 W/m^2		✓		
135	B	Sunshine duration sensor – Number of seconds in the last minute with SRD ≥ 120 W/m^2: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
136	SW	**SUNSHINE DURATION SENSOR** - Number of tens of seconds in the last 10 minutes with SRD ≥ 120 W/m^2		✓		
137	B	Sunshine duration sensor – Number of tens of seconds in the last 10 minutes with SRD ≥ 120 W/m^2: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
142	SW	**EVAPOTRANSPIRATION** in mm/h (x100).		✓		
143	B	Hourly evapotranspiration alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
144	SW	**EVAPOTRANSPIRATION** in mm/day (x100).		✓		
145	B	Daily evapotranspiration alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
146	SW	**SOLAR NET RADIATION** in W/m^2.		✓		
147	B	Solar net radiation alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
148	SW	**RELATIVE PRESSURE** in hPa measured by HD35EDWDPTC.		✓		
149	B	Alarm for relative pressure measured by HD35EDWDPTC: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
150	SW	**FLUID LEVEL** in m (x100) calculated by HD35EDWDPTC.		✓		
151	B	Alarm for fluid level calculated by HD35EDWDPTC: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
152	SW	**LOWER SURFACE LEAF WETNESS** in % (x10).		✓		
153	B	Lower surface leaf wetness: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
154	SW	**UPPER SURFACE LEAF WETNESS** in % (x10).		✓		
155	B	Upper surface leaf wetness: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
156	SW	**WIND GUST** in m/s (x100).		✓		

Address	Type	Input Register description	AP	ED	RE	AL
157	B	Wind gust alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
158	SW	**WIND GUST DIRECTION** in degrees (x10).		✓		
159	B	Wind gust direction alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
170	SW	**MAXIMUM RAIN RATE** in mm/h (x10).		✓		
171	B	Maximum rain rate alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
172	SW	**ALBEDO** in % (x10).		✓		
173	B	Albedo alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
174	SW	**TEMPERATURE** with **Pt100 sensor** of HP3517E… probe in the set measurement unit (x100).		✓		
175	B	Alarm for temperature with Pt100 sensor of HP3517E… probe: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
176	SW	**PM1** in µg/m^3 (x10).		✓		
177	B	PM1 alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
178	SW	**PM2.5** in µg/m^3 (x10).		✓		
179	B	PM2.5 alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
182	SW	**PM10** in µg/m^3 (x10).		✓		
183	B	PM10 alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
186	SW	**VOC INDEX**.		✓		
187	B	VOC index alarm: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
Measured values and status of measurement alarms for configurable inputs						
1000 + 200 x (**N**-1)	SW	**TEMPERATURE** with 2-wire **Pt100 sensor** of channel **N** in the set measurement unit (x10).		✓		
1001 + 200 x (**N**-1)	B	Alarm for temperature with 2-wire Pt100 sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1002 + 200 x (**N**-1)	SW	**TEMPERATURE** with 3-wire **Pt100 sensor** of channel **N** in the set measurement unit (x10).		✓		
1003 + 200 x (**N**-1)	B	Alarm for temperature with 3-wire Pt100 sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1004 + 200 x (**N**-1)	SW	**TEMPERATURE** with 4-wire **Pt100 sensor** of channel **N** in the set measurement unit (x10).		✓		
1005 + 200 x (**N**-1)	B	Alarm for temperature with 4-wire Pt100 sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1006 + 200 x (**N**-1)	SW	**TEMPERATURE** with 2-wire **Pt1000 sensor** of channel **N** in the set measurement unit (x10).		✓		
1007 + 200 x (**N**-1)	B	Alarm for temperature with 2-wire Pt1000 sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1008 + 200 x (**N**-1)	SW	**TEMPERATURE** with 3-wire **Pt1000 sensor** of channel **N** in the set measurement unit (x10).		✓		
1009 + 200 x (**N**-1)	B	Alarm for temperature with 3-wire Pt1000 sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1010 + 200 x (**N**-1)	SW	**TEMPERATURE** with 4-wire **Pt1000 sensor** of channel **N** in the set measurement unit (x10).		✓		
1011 + 200 x (**N**-1)	B	Alarm for temperature with 4-wire Pt1000 sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1012 + 200 x (**N**-1)	SW	**TEMPERATURE** with **TC_K** sensor of channel **N** in the set measurement unit (x10).		✓		
1013 + 200 x (**N**-1)	B	Alarm for temperature with TC_K sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		

Address	Type	Input Register description	AP	ED	RE	AL
1014 + 200 x (**N**-1)	SW	**TEMPERATURE** with **TC_J** sensor of channel **N** in the set measurement unit (x10).		✓		
1015 + 200 x (**N**-1)	B	Alarm for temperature with TC_J sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1016 + 200 x (**N**-1)	SW	**TEMPERATURE** WITH **TC_T** sensor of channel **N** in the set measurement unit (x10).		✓		
1017 + 200 x (**N**-1)	B	Alarm for temperature with TC_T sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1018 + 200 x (**N**-1)	SW	**TEMPERATURE** with **TC_N** sensor of channel **N** in the set measurement unit (x10).		✓		
1019 + 200 x (**N**-1)	B	Alarm for temperature with TC_N sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1026 + 200 x (**N**-1)	SW	**TEMPERATURE** with **TC_E** sensor of channel **N** in the set measurement unit (x10).		✓		
1027 + 200 x (**N**-1)	B	Alarm for temperature with TC_E sensor of channel **N**: 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1028 + 200 x (**N**-1)	SW	Input value in **mV** of channel **N** (x10). Only if channel **N** is configured as **0...1 V** input (HD35EDH).		✓		
1029 + 200 x (**N**-1)	B	Alarm for channel **N** if the channel is configured as 0…1 V input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1030 + 200 x (**N**-1)	SW	Input value in **mV** of channel **N** (x100). Only if channel **N** is configured as **0...50 mV** input (HD35EDH).		✓		
1031 + 200 x (**N**-1)	B	Alarm for channel **N** if the channel is configured as 0…50 mV input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1032 + 200 x (**N**-1)	SW	Input value in **mA** of channel **N** (x100). Only if channel **N** is configured as 4…20 mA input (HD35EDH).		✓		
1033 + 200 x (**N**-1)	B	Alarm for channel **N** if the channel is configured as 4…20 mA input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1034 + 200 x (**N**-1)	SW	Position of **potentiometer** in % of channel **N**. Only if channel **N** is configured as potentiometric input (HD35EDH).		✓		
1035 + 200 x (**N**-1)	B	Alarm for channel **N** if the channel is configured as potentiometric input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1036 + 200 x (**N**-1)	SW	Value of quantity associated to channel **N** if the channel is configured as 0…1 V input (HD35EDH).		✓		
1037 + 200 x (**N**-1)	B	Alarm for quantity associated to channel **N** if the channel is configured as 0…1 V input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1038 + 200 x (**N**-1)	SW	Value of quantity associated to channel **N** if the channel is configured as 0…50 mV input (HD35EDH).		✓		
1039 + 200 x (**N**-1)	B	Alarm for quantity associated to channel **N** if the channel is configured as 0…50 mV input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1040 + 200 x (**N**-1)	SW	Value of quantity associated to channel **N** if the channel is configured as 4…20 mA input (HD35EDH).		✓		
1041 + 200 x (**N**-1)	B	Alarm for quantity associated to channel **N** if the channel is configured as 4…20 mA input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1042 + 200 x (**N**-1)	SW	Value of quantity associated to channel **N** if the channel is configured as potentiometric input (HD35EDH).		✓		
1043 + 200 x (**N**-1)	B	Alarm for quantity associated to channel **N** if the channel is configured as potentiometric input (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1044 + 200 x (**N**-1)	SW	Input value in **mV** of channel **N**. Only if channel **N** is configured as **0...10 V** input (HD35EDWH).		✓		

Address	Type	Input Register description	AP	ED	RE	AL
1045 + 200 x (**N**-1)	B	Alarm for channel **N** if the channel is configured as 0…10 V input (HD35EDWH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
1046 + 200 x (**N**-1)	SW	Value of quantity associated to channel **N** if the channel is configured as 0…10 V input (HD35EDWH).		✓		
1047 + 200 x (**N**-1)	B	Alarm for quantity associated to channel **N** if the channel is configured as 0…10 V input (HD35EDWH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
4000 to 4001	SW	**Number of counts**. Only if the channel is configured as counter (HD35EDH).		✓		
4002 to 4003	B	Alarm for number of counts if the channel is configured as counter (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
da 4004 a 4005	SW	Value of quantity associated to the channel if the channel is configured as counter (HD35EDH).		✓		
4006 to 4007	B	Alarm for quantity associated to the channel if the channel is configured as counter (HD35EDH): 0=OFF, 1=lower threshold alarm, 2=higher threshold alarm.		✓		
Total amount of rain counter						
4128	W	CNT_0		✓		
4129	W	CNT_1		✓		
4130	W	CNT_2		✓		
		The total amount of rain in counts is: CNT_0 + (CNT_1 x 2^{16}) + (CNT_2 x 2^{32})				
Measurement units and resolution						
5000	W	Unit of measurement for **TEMPERATURE** with **NTC10K** sensor of channel **1**: 0=°C, 1=°F.		✓		
5004	W	**DEW POINT** measurement unit: 0=°C, 1=°F.		✓		
5012	W	**WET BULB TEMPERATURE** measurement unit: 0=°C, 1=°F.		✓		
5016	W	Unit of measurement for **TEMPERATURE** with **NTC10K** sensor of channel **2**: 0=°C, 1=°F.		✓		
5021	SW	**ILLUMINANCE** resolution: -2=100, -1=10, 0=1		✓		
5024	W	**ATMOSPHERIC PRESSURE** measurement unit: see TAB 12.1		✓		
5025	SW	**ATMOSPHERIC PRESSURE** resolution: …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
5046	W	Unit of measurement for **TEMPERATURE** with sensor integrated in RH module: 0=°C, 1=°F. Only for **models …TVI** and **…AB**.		✓		
5050	W	Unit of measurement for **TEMPERATURE** with **NTC10K** sensor of channel **3**: 0=°C, 1=°F.		✓		
5052	W	**WIND SPEED** measurement unit: see TAB 12.1		✓		
5053	SW	**WIND SPEED** resolution: …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
5056	W	**DIFFERENTIAL PRESSURE** measurement unit for range **r3**: see TAB 12.1		✓		
5057	SW	**DIFFERENTIAL PRESSURE** resolution for range **r3**: …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
5058	W	**WIND CHILL** measurement unit: 0=°C, 1=°F.		✓		
5060	W	**DIFFERENTIAL PRESSURE** measurement unit for ranges **r1** and **r2**: see TAB 12.1		✓		
5061	SW	**DIFFERENTIAL PRESSURE** resolution for ranges **r1** and **r2**: …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
5062	W	**DIFFERENTIAL PRESSURE** measurement unit for range **r4**: see TAB 12.1		✓		

Address	Type	Input Register description	AP	ED	RE	AL
5063	SW	**DIFFERENTIAL PRESSURE** resolution for range **r4**: …, -2=100, -1=10, 0=1, 1=0,1, 2=0,01, …		✓		
5064	W	Unit of measurement for **TEMPERATURE** with **Pt100** sensor of HP3517E… probe: 0=°C, 1=°F.		✓		
5072	W	Unit of measurement for **WET BULB TEMPERATURE** measured by the natural ventilation wet bulb probe: 0=°C, 1=°F.		✓		
5074	W	Unit of measurement for **GLOBE THERMOMETER TEMPERATURE**: 0=°C, 1=°F.		✓		
5076	W	Unit of measurement for **INDOOR WBGT INDEX**: 0=°C, 1=°F.		✓		
5078	W	Unit of measurement for **OUTDOOR WBGT INDEX**: 0=°C, 1=°F.		✓		
5126	W	Unit of measurement for **WET BULB TEMPERATURE** calculated by HD35EDWWBGT: 0=°C, 1=°F.		✓		
6000 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **2-wire Pt100** sensor of channel **N**: 0=°C, 1=°F.		✓		
6002 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **3-wire Pt100** sensor of channel **N**: 0=°C, 1=°F.		✓		
6004 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **4-wire Pt100** sensor of channel **N**: 0=°C, 1=°F.		✓		
6006 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **2-wire Pt1000** sensor of channel **N**: 0=°C, 1=°F.		✓		
6008 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **3-wire Pt1000** sensor of channel **N**: 0=°C, 1=°F.		✓		
6010 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **4-wire Pt1000** sensor of channel **N**: 0=°C, 1=°F.		✓		
6012 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **TC_K** sensor of channel **N**: 0=°C, 1=°F.		✓		
6014 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **TC_J** sensor of channel **N**: 0=°C, 1=°F.		✓		
6016 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **TC_T** sensor of channel **N**: 0=°C, 1=°F.		✓		
6018 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **TC_N** sensor of channel **N**: 0=°C, 1=°F.		✓		
6026 + 200 x (**N**-1)	W	Unit of measurement for **TEMPERATURE** with **TC_E** sensor of channel **N**: 0=°C, 1=°F.		✓		
6036 + 200 x (**N**-1)	W	Measurement unit of the quantity associated to channel **N** if the channel is configured as 0…1 V input (HD35EDH). See TAB 12.1		✓		
6037 + 200 x (**N**-1)	SW	Resolution of the quantity associated to channel **N** if the channel is configured as 0…1 V input (HD35EDH): …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
6038 + 200 x (**N**-1)	W	Measurement unit of the quantity associated to channel **N** if the channel is configured as 0…50 mV (HD35EDH). See TAB 12.1		✓		
6039 + 200 x (**N**-1)	SW	Resolution of the quantity associated to channel **N** if the channel is configured as 0…50 mV (HD35EDH): …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
6040 + 200 x (**N**-1)	W	Measurement unit of the quantity associated to channel **N** if the channel is configured as 4…20 mA input (HD35EDH). See TAB 12.1		✓		
6041 + 200 x (**N**-1)	SW	Resolution of the quantity associated to channel **N** if the channel is configured as 4…20 mA input (HD35EDH): …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
6042 + 200 x (**N**-1)	W	Measurement unit of the quantity associated to channel **N** if the channel is configured as potentiometric input (HD35EDH). See TAB 12.1		✓		
6043 + 200 x (**N**-1)	SW	Resolution of the quantity associated to channel **N** if the channel is configured as potentiometric input (HD35EDH): …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		

Address	Type	Input Register description	AP	ED	RE	AL
6046 + 200 x (**N**-1)	W	Measurement unit of the quantity associated to channel **N** if the channel is configured as 0…10 V input (HD35EDWH). See TAB 12.1		✓		
6047 + 200 x (**N**-1)	SW	Resolution of the quantity associated to channel **N** if the channel is configured as 0…10 V input (HD35EDWH): …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
9002	W	Measurement unit of the quantity associated to channel **N** if the channel is configured as counter (HD35EDH). See TAB 12.1		✓		
9003	SW	Resolution of the quantity associated to channel **N** if the channel is configured as counter (HD35EDH): …, -2=100, -1=10, 0=1, 1=0.1, 2=0.01, …		✓		
General information						
10000	W	Year of last measurement.		✓		
10001	W	Month of last measurement.		✓		
10002	W	Day of last measurement.		✓		
10003	W	Hour of last measurement.		✓		
10004	W	Minutes of last measurement.		✓		
10005	W	Seconds of last measurement.		✓		
10006	W	Packet Error Rate in % of the device (x10).		✓	✓	✓
10007	W	Number of RF hops of the last transmitted packet.		✓	✓	✓
10008	SW	RF signal level in dBm (relating to last RF hop).		✓	✓	✓
10009	W	Battery level: 0=empty, 1=half full , 2=full, 3=external power supply	✓	✓	✓	✓
10010	W	Time, in seconds, elapsed since the last transmitted packet.		✓	✓	✓
10011	W	RF signal level expressed as 0 to 7 scale.		✓	✓	✓
10012	W	Modbus address of the AP to which the device is connected.		✓	✓	✓
10013	W	Password level for the current connection: 0=no password, 1=user level, 2= administrator level	✓			
10014	W	Battery remaining capacity in %.	✓		✓	
10015	W	Estimation of battery remaining capacity in hours (x10).	✓		✓	
10016	W	Type of power supply: 0=battery, 1=USB, 2=ext. power supply	✓		✓	
10017	W	Estimation of battery remaining capacity in weeks		✓		✓
10018	W	Alarm relay #1 status: 0=deactivated, 1=intermittent, 2=active, 3=undetermined				✓
10019	W	Alarm relay #2 status: 0=deactivated, 1=intermittent, 2=active, 3=undetermined				✓

HOLDING REGISTERS

Address	Type	Holding Register description	AP	ED	RE	AL
Measurement alarm thresholds						
0	SW	Lower alarm threshold for **TEMPERATURE** with **NTC10K** sensor of channel **1** in the set measurement unit (x10).		✓		
1	SW	Higher alarm threshold for temperature with NTC10K sensor of channel 1 in the set measurement unit (x10).		✓		
2	SW	**RH** lower alarm threshold in % (x10). Only for **models …TC and …TV**.		✓		
3	SW	RH higher alarm threshold in % (x10). Only for models …TC and …TV.		✓		
4	SW	**DEW POINT** lower alarm threshold in the set measurement unit (x10).		✓		
5	SW	Dew point higher alarm threshold in the set measurement unit (x10).		✓		
6	SW	**PARTIAL VAPOR PRESSURE** lower alarm threshold in hPa (x100).		✓		
7	SW	Partial vapor pressure higher alarm threshold in hPa (x100).		✓		
8	SW	**MIXING RATIO** lower alarm threshold in g/Kg (x10).		✓		
9	SW	Mixing ratio higher alarm threshold in g/Kg (x10).		✓		
10	SW	**ABSOLUTE HUMIDITY** lower alarm threshold in g/m^3 (x10).		✓		
11	SW	Absolute humidity higher alarm threshold in g/m^3 (x10).		✓		
12	SW	**WET BULB TEMPERATURE** lower alarm threshold in the set measurement unit (x10).		✓		
13	SW	Wet bulb temperature higher alarm threshold in the set measurement unit (x10).		✓		
16	SW	Lower alarm threshold for **TEMPERATURE** with **NTC10K** sensor of channel **2** in the set measurement unit (x10).		✓		
17	SW	Higher alarm threshold for temperature with NTC10K sensor of channel 2 in the set measurement unit (x10).		✓		
18	SW	Lower alarm threshold for **SOLAR RADIATION** in W/m^2.		✓		
19	SW	Higher alarm threshold for solar radiation in W/m^2.		✓		
20	SW	**ILLUMINANCE** (low range, models HD35ED...I...) lower alarm threshold in lux.		✓		
21	SW	Illuminance (low range, models HD35ED...I...) higher alarm threshold in lux		✓		
22	SW	**CO** lower alarm threshold in ppm.		✓		
23	SW	CO higher alarm threshold in ppm.		✓		
24	SW	**ATMOSPHERIC PRESSURE** lower alarm threshold in the set measurement unit (the multiplier depends on the set unit).		✓		
25	SW	Atmospheric pressure higher alarm threshold in the set measurement unit (the multiplier depends on the set unit).		✓		
30	SW	Lower alarm threshold for **DAILY SOLAR RADIATION** in Wh/m^2.		✓		
31	SW	Higher alarm threshold for daily solar radiation in Wh/m^2.		✓		
32	SW	**CO_2** lower alarm threshold in ppm.		✓		
33	SW	CO_2 higher alarm threshold in ppm.		✓		
34	SW	Lower alarm threshold for **SOIL VOLUMETRIC WATER CONTENT** (**VWC**) in % (x10).		✓		
35	SW	Higher alarm threshold for soil volumetric water content (VWC) in % (x10).		✓		
36	SW	Lower alarm threshold for **VWC PROBE OUTPUT** in mV (x10).		✓		
37	SW	Higher alarm threshold for VWC probe output in mV (x10).		✓		

Address	Type	Holding Register description	AP	ED	RE	AL
46	SW	Lower alarm threshold for **TEMPERATURE** with sensor integrated in RH module in the set measurement unit (x10). Only for **models …TVI** and **…AB**.		✓		
47	SW	Higher alarm threshold for temperature with sensor integrated in RH module in the set measurement unit (x10). Only for models …TVI and …AB.		✓		
48	SW	**RH** lower alarm threshold in % (x10). Only for **models …TVI** and **…AB**.		✓		
49	SW	RH higher alarm threshold in % (x10). Only for models …TVI and …AB.		✓		
50	SW	Lower alarm threshold for **TEMPERATURE** with **NTC10K** sensor of channel **3** in the set measurement unit (x10).		✓		
51	SW	Higher alarm threshold for temperature with NTC10K sensor of channel 3 in the set measurement unit (x10).		✓		
52	SW	**WIND SPEED** (cup anemometer) lower alarm threshold in the set measurement unit (the multiplier depends on the set unit).		✓		
53	SW	Wind speed (cup anemometer) higher alarm threshold in the set measurement unit (multiplier depends on the set unit).		✓		
54	SW	**WIND DIRECTION** (wind vane) lower alarm threshold in degrees.		✓		
55	SW	Wind direction (wind vane) higher alarm threshold in degrees.		✓		
56	SW	**DIFFERENTIAL PRESSURE** lower alarm threshold for range **r3** in the set measurement unit (the multiplier depends on the set unit).		✓		
57	SW	Differential pressure higher alarm threshold for range r3 in the set measurement unit (multiplier depends on the set unit).		✓		
58	SW	Lower alarm threshold for **WIND CHILL** in the set measurement unit (x10).		✓		
59	SW	Higher alarm threshold for wind chill in the set measurement unit (x10).		✓		
60	SW	**DIFFERENTIAL PRESSURE** lower alarm threshold for ranges **r1** and **r2** in the set measurement unit (the multiplier depends on the set unit).		✓		
61	SW	Differential pressure higher alarm threshold for ranges r1 and r2 in the set measurement unit (the multiplier depends on the set unit).		✓		
62	SW	**DIFFERENTIAL PRESSURE** lower alarm threshold for range **r4** in the set measurement unit (the multiplier depends on the set unit).		✓		
63	SW	Differential pressure higher alarm threshold for range r4 in the set measurement unit (the multiplier depends on the set unit).		✓		
64	SW	Lower alarm threshold for **TEMPERATURE** with **Pt100** sensor of HP3517E… probe in the set measurement unit (x10).		✓		
65	SW	Higher alarm threshold for temperature with Pt100 sensor of HP3517E… probe in the set measurement unit (x10).		✓		
66	SW	Lower alarm threshold for **PYRANOMETER OUTPUT** in mV (x100).		✓		
67	SW	Higher alarm threshold for **PYRANOMETER OUTPUT** in mV (x100).		✓		
68	SW	**UVA IRRADIANCE** (low range) lower alarm threshold in mW/m^2.		✓		
69	SW	UVA irradiance (low range) higher alarm threshold in mW/m^2.		✓		
70	SW	**PROPORTION OF UV PRESENT** lower alarm threshold in µW/lumen.		✓		
71	SW	Proportion of UV present higher alarm threshold in µW/lumen.		✓		
72	SW	Lower alarm threshold for **WET BULB TEMPERATURE** measured by the natural ventilation wet bulb probe, in the set measurement unit (x10).		✓		
73	SW	Higher alarm threshold for wet bulb temperature measured by the natural ventilation wet bulb probe, in the set measurement unit (x10).		✓		

Address	Type	Holding Register description	AP	ED	RE	AL
74	SW	Lower alarm threshold for **GLOBE THERMOMETER TEMPERATURE** in the set measurement unit (x10).		✓		
75	SW	Higher alarm threshold for globe thermometer temperature in the set measurement unit (x10).		✓		
76	SW	**INDOOR WBGT INDEX** lower alarm threshold in the set measurement unit (x10).		✓		
77	SW	Indoor WBGT index higher alarm threshold in the set measurement unit (x10).		✓		
78	SW	**OUTDOOR WBGT INDEX** lower alarm threshold in the set measurement unit (x10).		✓		
79	SW	Outdoor WBGT index higher alarm threshold in the set measurement unit (x10).		✓		
80	SW	**ILLUMINANCE** (high range, models HD35ED...I2...) lower alarm threshold in lux.		✓		
81	SW	Illuminance (high range, models HD35ED...I2...) higher alarm threshold in lux		✓		
82	SW	**WIND GUST** lower alarm threshold in m/s.		✓		
83	SW	Wind gust higher alarm threshold in m/s.		✓		
86	SW	**RAIN RATE** lower alarm threshold in counts/h.		✓		
87	SW	Rain rate higher alarm threshold in counts/h.		✓		
88	SW	**DAILY RAIN** lower alarm threshold in counts.		✓		
89	SW	Daily rain higher alarm threshold in counts.		✓		
92	SW	**WIND SPEED** (HD52.3D anemometer) lower alarm threshold in m/s (x100).		✓		
93	SW	Wind speed (HD52.3D anemometer) higher alarm threshold in m/s (x100).		✓		
94	SW	**WIND DIRECTION** (HD52.3D anemometer) lower alarm threshold in degrees (x10).		✓		
95	SW	Wind direction (HD52.3D anemometer) higher alarm threshold in degrees (x10).		✓		
96	SW	Lower alarm threshold for **MEAN KINETIC TEMPERATURE** of channel **1** in the set measurement unit (x10).		✓		
97	SW	Higher alarm threshold for mean kinetic temperature of channel 1 in the set measurement unit (x10).		✓		
98	SW	Lower alarm threshold for **MEAN KINETIC TEMPERATURE** of channel **2** in the set measurement unit (x10).		✓		
99	SW	Higher alarm threshold for mean kinetic temperature of channel 2 in the set measurement unit (x10).		✓		
100	SW	Lower alarm threshold for **MEAN KINETIC TEMPERATURE** of channel **3** in the set measurement unit (x10).		✓		
101	SW	Higher alarm threshold for mean kinetic temperature of channel 3 in the set measurement unit (x10).		✓		
104	SW	**FLOW** lower alarm threshold in l/s.		✓		
105	SW	Flow higher alarm threshold in l/s.		✓		
106	SW	**FLOW** lower alarm threshold in l/min.		✓		
107	SW	Flow higher alarm threshold in l/min.		✓		
108	SW	**FLOW** lower alarm threshold in m^3/min.		✓		
109	SW	Flow higher alarm threshold in m^3/min.		✓		
110	SW	Lower alarm threshold for **SOIL VOLUMETRIC WATER CONTENT** (**VWC**) in % (x10) – channel **2**.		✓		
111	SW	Higher alarm threshold for soil volumetric water content in % (x10) – channel 2.		✓		

Address	Type	Holding Register description	AP	ED	RE	AL
112	SW	Lower alarm threshold for **VWC PROBE OUTPUT** in mV (x10) – channel **2**.		✓		
113	SW	Higher alarm threshold for VWC probe output in mV (x10) – channel 2.		✓		
114	SW	Lower alarm threshold for **SOIL VOLUMETRIC WATER CONTENT** (**VWC**) in % (x10) – channel **3**.		✓		
115	SW	Higher alarm threshold for soil volumetric water content in % (x10) – channel 3.		✓		
116	SW	Lower alarm threshold for **VWC PROBE OUTPUT** in mV (x10) – channel **3**.		✓		
117	SW	Higher alarm threshold for VWC probe output in mV (x10) – channel 3.		✓		
118	SW	**AIR SPEED** (HD404…SR transmitter) lower alarm threshold in m/s (x100).		✓		
119	SW	Air speed (HD404…SR transmitter) higher alarm threshold in m/s (x100).		✓		
122	SW	Lower alarm threshold for **RAINFALL QUANTITY IN THE LAST HOUR** in counts.		✓		
123	SW	Higher alarm threshold for rainfall quantity in the last hour in counts.		✓		
126	SW	Lower alarm threshold for **WET BULB TEMPERATURE** calculated by HD35EDWWBGT, in the set measurement unit (x10).		✓		
127	SW	Higher alarm threshold for Wet bulb temperature calculated by HD35EDWWBGT, in the set measurement unit (x10).		✓		
128	SW	**POWER SUPPLY VOLTAGE** lower alarm threshold in V (x100).		✓		
129	SW	Power supply voltage higher alarm threshold in V (x100).		✓		
130	SW	**AMOUNT OF RAIN** lower alarm threshold in counts.		✓		
131	SW	Amount of rain higher alarm threshold in counts.		✓		
132	SW	**SUNSHINE DURATION SENSOR** - Sun presence lower alarm threshold		✓		
133	SW	Sunshine duration sensor - Sun presence higher alarm threshold		✓		
134	SW	**SUNSHINE DURATION SENSOR** - Number of seconds in the last minute with SRD ≥ 120 W/m^2 lower alarm threshold		✓		
135	SW	Sunshine duration sensor - Number of seconds in the last minute with SRD ≥ 120 W/m^2 higher alarm threshold		✓		
136	SW	**SUNSHINE DURATION SENSOR** - Number of tens of seconds in the last 10 minutes with SRD ≥ 120 W/m^2 lower alarm threshold		✓		
137	SW	Sunshine duration sensor - Number of tens of seconds in the last 10 minutes with SRD ≥ 120 W/m^2 higher alarm threshold		✓		
142	SW	**EVAPOTRANSPIRATION** lower alarm threshold in mm/h (x100).		✓		
143	SW	Evapotranspiration higher alarm threshold in mm/h (x100).		✓		
144	SW	**EVAPOTRANSPIRATION** lower alarm threshold in mm/day (x100).		✓		
145	SW	Evapotranspiration higher alarm threshold in mm/day (x100).		✓		
146	SW	**SOLAR NET RADIATION** lower alarm threshold in W/m^2.		✓		
147	SW	Solar net radiation higher alarm threshold in W/m^2.		✓		
148	SW	Lower alarm threshold for **RELATIVE PRESSURE** measured by HD35EDWDPTC, in hPa.		✓		
149	SW	Higher alarm threshold for relative pressure measured by HD35EDWDPTC, in hPa.		✓		
150	SW	Lower alarm threshold for **FLUID LEVEL** calculated by HD35EDWDPTC, in m (x100).		✓		
151	SW	Higher alarm threshold for fluid level calculated by HD35EDWDPTC, in m (x100).		✓		

Address	Type	Holding Register description	AP	ED	RE	AL
152	SW	**LOWER SURFACE LEAF WETNESS** lower alarm threshold in % (x10).		✓		
153	SW	Lower surface leaf wetness higher alarm threshold in % (x10).		✓		
154	SW	**UPPER SURFACE LEAF WETNESS** lower alarm threshold in % (x10).		✓		
155	SW	Upper surface leaf wetness higher alarm threshold in % (x10).		✓		
156	SW	**WIND GUST** lower alarm threshold in m/s (x100).		✓		
157	SW	Wind gust higher alarm threshold in m/s (x100).		✓		
158	SW	**WIND GUST DIRECTION** lower alarm threshold in degrees (x10).		✓		
159	SW	Wind gust direction higher alarm threshold in degrees (x10).		✓		
170	SW	**MAXIMUM RAIN RATE** lower alarm threshold in mm/h (x10).		✓		
171	SW	Maximum rain rate higher alarm threshold in mm/h (x10).		✓		
172	SW	**ALBEDO** lower alarm threshold in % (x10).		✓		
173	SW	Albedo higher alarm threshold in % (x10).		✓		
174	SW	Lower alarm threshold for **TEMPERATURE** with **Pt100** sensor of HP3517E… probe in the set measurement unit (x100).		✓		
175	SW	Higher alarm threshold for temperature with Pt100 sensor of HP3517E… probe in the set measurement unit (x100).		✓		
176	SW	**PM1** lower alarm threshold in µg/m^3 (x10).		✓		
177	SW	PM1 higher alarm threshold in µg/m^3 (x10).		✓		
178	SW	**PM2.5** lower alarm threshold in µg/m^3 (x10).		✓		
179	SW	PM2.5 higher alarm threshold in µg/m^3 (x10).		✓		
182	SW	**PM10** lower alarm threshold in µg/m^3 (x10).		✓		
183	SW	PM10 higher alarm threshold in µg/m^3 (x10).		✓		
186	SW	**VOC INDEX** lower alarm threshold.		✓		
187	SW	VOC index higher alarm threshold.		✓		
Measurement alarm thresholds for configurable inputs						
1000 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **2-wire Pt100** sensor of channel **N** in the set measurement unit (x10).		✓		
1001 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with 2-wire Pt100 sensor of channel **N** in the set measurement unit (x10).		✓		
1002 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **3-wire Pt100** sensor of channel **N** in the set measurement unit (x10).		✓		
1003 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with 3-wire Pt100 sensor of channel **N** in the set measurement unit (x10).		✓		
1004 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **4-wire Pt100** sensor of channel **N** in the set measurement unit (x10).		✓		
1005 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with 4-wire Pt100 sensor of channel **N** in the set measurement unit (x10).		✓		
1006 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **2-wire Pt1000** sensor of channel **N** in the set measurement unit (x10).		✓		
1007 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with 2-wire Pt1000 sensor of channel **N** in the set measurement unit (x10).		✓		
1008 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **3-wire Pt1000** sensor of channel **N** in the set measurement unit (x10).		✓		
1009 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with 3-wire Pt1000 sensor of channel **N** in the set measurement unit (x10).		✓		
1010 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **4-wire Pt1000** sensor of channel **N** in the set measurement unit (x10).		✓		
1011 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with 4-wire Pt1000 sensor of channel **N** in the set measurement unit (x10).		✓		

Address	Type	Holding Register description	AP	ED	RE	AL
1012 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **TC_K** sensor of channel **N** in the set measurement unit (x10).		✓		
1013 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with TC_K sensor of channel N in the set measurement unit (x10).		✓		
1014 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **TC_J** sensor of channel **N** in the set measurement unit (x10).		✓		
1015 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with TC_J sensor of channel N in the set measurement unit (x10).		✓		
1016 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **TC_T** sensor of channel **N** in the set measurement unit (x10).		✓		
1017 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with TC_T sensor of channel N in the set measurement unit (x10).		✓		
1018 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **TC_N** sensor of channel **N** in the set measurement unit (x10).		✓		
1019 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with TC_N sensor of channel N in the set measurement unit (x10).		✓		
1026 + 200 x (**N**-1)	SW	Lower alarm threshold for **TEMPERATURE** with **TC_E** sensor of channel **N** in the set measurement unit (x10).		✓		
1027 + 200 x (**N**-1)	SW	Higher alarm threshold for temperature with TC_E sensor of channel N in the set measurement unit (x10).		✓		
1028 + 200 x (**N**-1)	SW	Channel **N** lower alarm threshold in **mV** (x10). Only if channel **N** is configured as **0...1 V** input (HD35EDH).		✓		
1029 + 200 x (**N**-1)	SW	Channel **N** higher alarm threshold in mV (x10). Only if channel **N** is configured as 0…1 V input (HD35EDH).		✓		
1030 + 200 x (**N**-1)	SW	Channel **N** lower alarm threshold in **mV** (x100). Only if channel **N** is configured as **0...50 mV** input (HD35EDH).		✓		
1031 + 200 x (**N**-1)	SW	Channel **N** higher alarm threshold in mV (x100). Only if channel **N** is configured as 0…50 mV input (HD35EDH).		✓		
1032 + 200 x (**N**-1)	SW	Channel **N** lower alarm threshold in **mA** (x100). Only if channel **N** is configured as 4…20 mA input (HD35EDH).		✓		
1033 + 200 x (**N**-1)	SW	Channel **N** higher alarm threshold in mA (x100). Only if channel **N** is configured as 4…20 mA input (HD35EDH).		✓		
1034 + 200 x (**N**-1)	SW	Channel **N** lower alarm threshold in **%**. Only if channel **N** is configured as potentiometric input (HD35EDH).		✓		
1035 + 200 x (**N**-1)	SW	Channel **N** higher alarm threshold in **%**. Only if channel **N** is configured as potentiometric input (HD35EDH).		✓		
1036 + 200 x (**N**-1)	SW	Lower alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 0…1 V input (HD35EDH).		✓		
1037 + 200 x (**N**-1)	SW	Higher alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 0…1 V input (HD35EDH).		✓		
1038 + 200 x (**N**-1)	SW	Lower alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 0…50 mV (HD35EDH).		✓		
1039 + 200 x (**N**-1)	SW	Higher alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 0…50 mV (HD35EDH).		✓		
1040 + 200 x (**N**-1)	SW	Lower alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 4…20 mA (HD35EDH).		✓		
1041 + 200 x (**N**-1)	SW	Higher alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 4…20 mA (HD35EDH).		✓		
1042 + 200 x (**N**-1)	SW	Lower alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as potentiometric input (HD35EDH).		✓		

Address	Type	Holding Register description	AP	ED	RE	AL
1043 + 200 x (**N**-1)	SW	Higher alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as potentiometric input (HD35EDH).		✓		
1044 + 200 x (**N**-1)	SW	Channel **N** lower alarm threshold in **mV**. Only if channel **N** is configured as **0...10 V** input (HD35EDWH).		✓		
1045 + 200 x (**N**-1)	SW	Channel **N** higher alarm threshold in mV. Only if channel **N** is configured as 0…10 V input (HD35EDWH).		✓		
1046 + 200 x (**N**-1)	SW	Lower alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 0…10 V input (HD35EDWH).		✓		
1047 + 200 x (**N**-1)	SW	Higher alarm threshold expressed as value of the quantity associated to channel **N** when the channel is configured as 0…10 V input (HD35EDWH).		✓		
4000 to 4001	SW	Lower alarm threshold as number of **counts**. Only if the channel is configured as counter (HD35EDH).		✓		
4002 to 4003	SW	Higher alarm threshold as number of **counts**. Only if the channel is configured as counter (HD35EDH).		✓		
4004 to 4005	SW	Lower alarm threshold expressed as value of the quantity associated to the channel when the channel is configured as counter (HD35EDH).		✓		
4006 to 4007	SW	Higher alarm threshold expressed as value of the quantity associated to the channel when the channel is configured as counter (HD35EDH).		✓		
General information						
10000 to 10019	B	User code with ASCII codification. Acceptable values are in the set {32,…,126}.	✓	✓	✓	✓
10020	W	Current year	✓			
10021	W	Current month	✓			
10022	W	Current day	✓			
10023	W	Current hour	✓			
10024	W	Current minute	✓			
10025	W	Current second	✓			
10026	W	Measurement interval: 0=1s, 1=2s, 2=5s, 3=10s, 4=15s, 5=30s, 6=1min, 7=2min, 8=5min, 9=10min, 10=15min, 11=30min, 12=1h		✓		
10027	W	Logging/RF interval: 0=1s, 1=2s, 2=5s, 3=10s, 4=15s, 5=30s, 6=1min, 7=2min, 8=5min, 9=10min, 10=15min, 11=30min, 12=1h		✓		✓
10029	W	Network RF channel. By changing this register, all network devices migrate to the new RF channel.	✓			
10030	W	Max number of RF transmissions for each command sent by AP to a remote device.	✓			
10031	W	Packet Error Rate threshold in % (x10) for RF alarms generation (for ex. 500 means 50.0%)	✓			
10032	W	Temperature measurement unit: 0=°C, 1=°F The setting is extended to all EDs except for mapped quantities in HD35EDH	✓			
10033	W	Atmospheric pressure measurement unit: see TAB 12.1. The setting extends to all EDs except for mapped quantities in HD35EDH	✓			
10034	W	Baud rate RS485: 0=9600, 1=19200, 3=38400 bit/s	✓			
10035	W	RS485 communication mode: 0=8N1, 1=8N2, 2=8E1, 3=8E2, 4=8O1, 5=8O2	✓			
10036	W	Password to be supplied to enable configuration change commands. The reading provides the fixed value 32768.	✓			
10037 to 10046	B	Device group with ASCII codification. Acceptable values are in the set {32,…,126}.	✓	✓	✓	✓

Address	Type	Holding Register description	AP	ED	RE	AL
10047	W	Wind speed measurement unit: see TAB 12.1. The setting is extended to all EDs except for the mapped quantities in HD35EDH	✓			
10048	W	Rainfall quantity measurement unit: see TAB 12.1. The setting is extended to all EDs except for the mapped quantities in HD35EDH	✓			
10049	W	Differential pressure measurement unit for ranges r1, r2 and r3: see TAB 12.1. The setting is extended to all EDs except for the mapped quantities in HD35EDH	✓			
10050	W	Differential pressure measurement unit for range r4: see TAB 12.1. The setting is extended to all EDs except for the mapped quantities in HD35EDH	✓			
10051	W	Rain gauge resolution, in thousandths of mm *Example*: 0200 ⇒ 0.200 mm		✓		
10052	W	Setting of the quantities to be displayed in the automatic viewing cycle for models HD35EDLW… without keyboard. Set the i-th bit (starting from LSB) to 1 if you wish to include the i-th quantity in the viewing cycle. *Example*: if in the model measuring and calculating: 1=Temp., 2=RH, 3=Td, 4=PVP, 5=Mix.Ratio, 6=AH, 7=Tw, the register is set to 0000 0000 0010 0010, only the relative humidity (RH) and the absolute humidity (AH) will be displayed alternatively.		✓		
10053	W	Setting of the RF quantities (RSSI, PER%) to be displayed in the automatic viewing cycle for models HD35EDLW… without keyboard. Set the i-th bit (starting from LSB) to 1 if you wish to include the i-th RF quantity in the viewing cycle.		✓		
10054	W	Period, in hours, of CO_2 sensor auto calibration.		✓		
10055	W	Period, in hours, after which the first CO_2 auto calibration after activation will occur.		✓		
10056	W	CO_2 reference value (in ppm) for auto calibration.		✓		
10057	W	CO_2 maximum acceptable variation (in ppm), with respect to the reference value, for auto calibration.		✓		
10058	W	Relay #1 activation duration in seconds (1…54000 s) in case of cyclical activation (*Coils – address 18 = 0*).				✓
10059	W	Relay #1 deactivation duration in seconds (1…54000 s) in case of cyclical activation (*Coils – address 18 = 0*).				✓
10060	W	Number of relay #1 activations in case of cyclical activation (*Coils – address 18 = 0*).				✓
10061	W	Relay #2 activation duration in seconds (1…54000 s) in case of cyclical activation *(Coils – address 21 = 0*).				✓
10062	W	Relay #2 deactivation duration in seconds (1…54000 s) in case of cyclical activation (*Coils – address 21 = 0*).				✓
10063	W	Number of relay #2 activations in case of cyclical activation (*Coils – address 21 = 0*).				✓
20000 to 20011	B	User code with ASCII codification of measurement #1. Available for models with more measurements of the same type.		✓		
20012 to 20023	B	User code with ASCII codification of measurement #2. Available for models with more measurements of the same type.		✓		
20024 to 20035	B	User code with ASCII codification of measurement #3. Available for models with more measurements of the same type.		✓		
20036 to 20047	B	User code with ASCII codification of measurement #4. Available for models with more measurements of the same type.		✓		
20048 to 20059	B	User code with ASCII codification of measurement #5. Available for models with more measurements of the same type.		✓		
20060 to 20071	B	User code with ASCII codification of measurement #6. Available for models with more measurements of the same type.		✓		
20072 to 20083	B	User code with ASCII codification of measurement #7. Available for models with more measurements of the same type.		✓		

Address	Type	Holding Register description	AP	ED	RE	AL
20084 to 20095	B	User code with ASCII codification of measurement #8. Available for models with more measurements of the same type.		✓		
20096 to20107	B	User code with ASCII codification of measurement #9. Available for models with more measurements of the same type.		✓		
20108 to 20119	B	User code with ASCII codification of measurement #10. Available for models with more measurements of the same type.		✓		
20120 to 20131	B	User code with ASCII codification of measurement #11. Available for models with more measurements of the same type.		✓		
20132 to 20143	B	User code with ASCII codification of measurement #12. Available for models with more measurements of the same type.		✓		

Warning: the execution of MODBUS commands changing the parameters setting of a device can take a certain time, due to the RF transmission between the device and the base unit. The value of the flag PENDING_CONF (Discrete Inputs – address 2) is set to 1 during the execution of a configuration change request. Only when the flag returns to 0 the request is considered as concluded. The flag CMD_FAILURE (Coils – address 7) allows to check whether the request was successful. It is recommended to check the status of the two flags before considering a device configuration changed.

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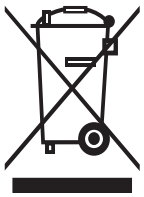
WARRANTY

Delta OHM is required to respond to the "factory warranty" only in those cases provided by Legislative Decree 6 September 2005 - n. 206. Each instrument is sold after rigorous inspections; if any manufacturing defect is found, it is necessary to contact the distributor where the instrument was purchased from. During the warranty period (24 months from the date of invoice) any manufacturing defects found will be repaired free of charge. Misuse, wear, neglect, lack or inefficient maintenance as well as theft and damage during transport are excluded. Warranty does not apply if changes, tampering or unauthorized repairs are made on the product. Solutions, probes, electrodes and microphones are not guaranteed as the improper use, even for a few minutes, may cause irreparable damages.
Delta OHM repairs the products that show defects of construction in accordance with the terms and conditions of warranty included in the manual of the product. For any dispute, the competent court is the Court of Padua. The Italian law and the "Convention on Contracts for the International Sales of Goods" apply.

TECHNICAL INFORMATION

The quality level of our instruments is the result of the continuous product development. This may lead to differences between the information reported in the manual and the instrument you have purchased. In case of discrepancies and/or inconsistencies, please write to sales@deltaohm.com.
Delta OHM reserves the right to change technical specifications and dimensions to fit the product requirements without prior notice.

DISPOSAL INFORMATION



Electrical and electronic equipment marked with specific symbol in compliance with 2012/19/EU Directive must be disposed of separately from household waste. European users can hand them over to the dealer or to the manufacturer when purchasing a new electrical and electronic equipment, or to a WEEE collection point designated by local authorities. Illegal disposal is punished by law.

Disposing of electrical and electronic equipment separately from normal waste helps to preserve natural resources and allows materials to be recycled in an environmentally friendly way without risks to human health.

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