

**Modbus table for
connecting S21
automation to BMS**

TO ENABLE OPERATION VIA THE MODBUS RTU PROTOCOL THROUGH THE RS-485 INTERFACE, DISCONNECT ALL THE WIRED CONTROL PANELS CONNECTED TO THE AIR HANDLING UNIT THROUGH THIS INTERFACE

SIMULTANEOUS OPERATION THROUGH RS-485, WI-FI, AND ETHERNET INTERFACES IS POSSIBLE

TO USE WIRED CONTROL PANELS, THE BMS MUST BE CONNECTED THROUGH WI-FI AND/OR ETHERNET INTERFACES VIA MODBUS TCP PROTOCOL

MODBUS PARAMETERS

Modbus RTU				
Baud rate	Number of data bits	Stop bits	Parity type	Address
9600	8	1	None (by default)	1-16
14400		1.5	even	1 (by default)
19200		2 (by default)	odd	
38400				
57600				
115200 (by default)				
Modbus TCP				
IP address*	Port	Maximum number of simultaneous TCP connections	TCP connection timeout	
Static	502	For Ethernet = 1, for Wi-Fi = 1	30 seconds	
DHCP (by default)				

*Wi-Fi IP address in access point mode – 192.168.4.1

The RS-485, Wi-Fi, and Ethernet network parameters for air handling units are configured using a mobile application. Maximum number of registers in one package: 125 (for 16-bit registers) and 2000 (for 1-bit registers). Supported modbus functions: 1, 2, 3, 4, 5, 6, 15, 16.

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension
Coils (1 bit registers) - modbus functions: 1, 5, 15									
0	R/W	CL_POWER	Coils (1-bit registers) - modbus functions: 1, 5, 15	0	1	0	—	Bool	1
1	R/W	CL_TIMER	Unit On/Off	0	1	0	—	Bool	1
2	R/W	CL_WEEK	Main timer	0	1	0	—	Bool	1
3	R	CL_Boost_MODE	Weekly Schedule	0	1	—	—	Bool	1
4	R	CL_FPLC_MODE	Boost mode	0	1	—	—	Bool	1
5	R/W	CL_IntRH_CTRL	Fireplace mode	0	1	0	—	Bool	1
6	R/W	CL_ExtRH_CTRL	Main humidity sensor activation	0	1	0	—	Bool	1
7	R/W	CL_IntCO2_CTRL	External humidity sensor activation	0	1	0	—	Bool	1
8	R/W	CL_ExtCO2_CTRL	Main CO ₂ sensor activation	0	1	0	—	Bool	1
9	R/W	CL_IntPM2_5_CTRL	External PM2.5 sensor activation	0	1	0	—	Bool	1
10	R/W	CL_ExtPM2_5_CTRL	Main PM2.5 sensor activation	0	1	0	—	Bool	1
11	R/W	CL_IntVOC_CTRL	External VOC sensor activation	0	1	0	—	Bool	1
12	R/W	CL_ExtVOC_CTRL	Main VOC sensor activation	0	1	0	—	Bool	1
13	R/W	CL_BoostSWITCH_CTRL	External VOC sensor activation	0	1	1	—	Bool	1
14	R/W	CL_FplcSWITCH_CTRL	Input activation for the boost mode switch	0	1	1	—	Bool	1
15	R/W	CL_FireALARM_CTRL	Input activation for the fireplace mode switch	0	1	0	—	Bool	1
16	R/W	CL_10V_SENSOR_CTRL	Fire alarm sensor activation	0	1	0	—	Bool	1
17	W	CL_RESET_FILTER_TIMER	Input activation for the external control device 0-10 V	1	1	—	—	Bool	1
18	W	CL_RESET_ALARM	Reset timer countdown to filter replacement	1	1	—	—	Bool	1
19	W	CL_RESTORE_FACTORY	Reset all alarms	1	1	—	—	Bool	1
20	R/W	CL_CLOUD_CTRL	Restore everything to factory settings	0	1	0	—	Bool	1
21	R/W	CL_MinSuAirOutTEMP_CTRL	Activation of control via cloud server	0	1	1	—	Bool	1
22	R/W	CL_WaterPRESS_CTRL	Minimum room supply air temperature control	0	1	1	—	Bool	1
23	R/W	CL_WaterFLOW_CTRL	Heat medium water pressure sensor activation	0	1	0	—	Bool	1
24	R/W	CL_WaterHeaterAutoRestart	Heat medium water flow sensor activation	0	1	1	—	Bool	1
Discrete Inputs (1-bit registers) - modbus functions: 2									
0	R	DI_CurBoostSWITCH	Current input status for the Boost mode switch	0	1	—	—	Bool	1
1	R	DI_CurFplcSWITCH	Current input status for the Fireplace mode switch	0	1	—	—	Bool	1
2	R	DI_CurFireALARM	Current status of the fire alarm sensor	0	1	—	—	Bool	1
3	R	DI_StatusRH	Humidity setpoint excess indication	0	1	—	—	Bool	1
4	R	DI_StatusCO2	CO ₂ setpoint excess indication	0	1	—	—	Bool	1
5	R	DI_StatusPM2_5	PM2.5 setpoint excess indication	0	1	—	—	Bool	1
6	R	DI_StatusVOC	VOC setpoint excess indication	0	1	—	—	Bool	1
7	R	DI_StatusHEATER	Heater operation indication	0	1	—	—	Bool	1
8	R	DI_StatusCOOLER	Cooler operation indication	0	1	—	—	Bool	1
9	R	DI_StatusFanBLOWING	Electric heater blowdown indication	0	1	—	—	Bool	1
10	R	DI_CurPreHeaterThermostat	Current input status for the preheating thermostat	0	1	—	—	Bool	1
11	R	DI_CurMainHeaterThermostat	Current input status for the reheating thermostat	0	1	—	—	Bool	1
12	R	DI_CurSuFilterPRESS	Current input status for the differential pressure switch of the supply filter	0	1	—	—	Bool	1
13	R	DI_CurExFilterPRESS	Current input status for the differential pressure switch of the extract filter	0	1	—	—	Bool	1
14	R	DI_CurWaterPRESS	Current status of the heat medium water pressure sensor	0	1	—	—	Bool	1
15	R	DI_CurWaterFLOW	Current status of the heat medium water flow sensor	0	1	—	—	Bool	1
16	R	DI_CurSuFanPRESS	Current input status for the differential pressure switch of the supply fan	0	1	—	—	Bool	1
17	R	DI_CurExFanPRESS	Current input status for the differential pressure switch of the extract fan	0	1	—	—	Bool	1
18	R	DI_WaterPreheatingStatus	Return water heating indicator before the air handling unit start-up	0	1	—	—	Bool	1
19	R	DI_AlarmCODE0	Alarm indicator with code No. 0	0	1	—	—	Bool	1
20	R	DI_AlarmCODE1	Alarm indicator with code No. 1	0	1	—	—	Bool	1
21	R	DI_AlarmCODE2	Alarm indicator with code No. 2	0	1	—	—	Bool	1
22	R	DI_AlarmCODE3	Alarm indicator with code No. 3	0	1	—	—	Bool	1
23	R	DI_AlarmCODE4	Alarm indicator with code No. 4	0	1	—	—	Bool	1
24	R	DI_AlarmCODE5	Alarm indicator with code No. 5	0	1	—	—	Bool	1
25	R	DI_AlarmCODE6	Alarm indicator with code No. 6	0	1	—	—	Bool	1
26	R	DI_AlarmCODE7	Alarm indicator with code No. 7	0	1	—	—	Bool	1
27	R	DI_AlarmCODE8	Alarm indicator with code No. 8	0	1	—	—	Bool	1
28	R	DI_AlarmCODE9	Alarm indicator with code No. 9	0	1	—	—	Bool	1
29	R	DI_AlarmCODE10	Alarm indicator with code No. 10	0	1	—	—	Bool	1
30	R	DI_AlarmCODE11	Alarm indicator with code No. 11	0	1	—	—	Bool	1
31	R	DI_AlarmCODE12	Alarm indicator with code No. 12	0	1	—	—	Bool	1
32	R	DI_AlarmCODE13	Alarm indicator with code No. 13	0	1	—	—	Bool	1
33	R	DI_AlarmCODE14	Alarm indicator with code No. 14	0	1	—	—	Bool	1
34	R	DI_AlarmCODE15	Alarm indicator with code No. 15	0	1	—	—	Bool	1
35	R	DI_AlarmCODE16	Alarm indicator with code No. 16	0	1	—	—	Bool	1
36	R	DI_AlarmCODE17	Alarm indicator with code No. 17	0	1	—	—	Bool	1
37	R	DI_AlarmCODE18	Alarm indicator with code No. 18	0	1	—	—	Bool	1
38	R	DI_AlarmCODE19	Alarm indicator with code No. 19	0	1	—	—	Bool	1
39	R	DI_AlarmCODE20	Alarm indicator with code No. 20	0	1	—	—	Bool	1
40	R	DI_AlarmCODE21	Alarm indicator with code No. 21	0	1	—	—	Bool	1
41	R	DI_AlarmCODE22	Alarm indicator with code No. 22	0	1	—	—	Bool	1
42	R	DI_AlarmCODE23	Alarm indicator with code No. 23	0	1	—	—	Bool	1
43	R	DI_AlarmCODE24	Alarm indicator with code No. 24	0	1	—	—	Bool	1

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension
44	R	DI_AlarmCODE25	Alarm indicator with code No. 25	0	1	—	—	Bool	1
45	R	DI_AlarmCODE26	Alarm indicator with code No. 26	0	1	—	—	Bool	1
46	R	DI_AlarmCODE27	Alarm indicator with code No. 27	0	1	—	—	Bool	1
47	R	DI_AlarmCODE28	Alarm indicator with code No. 28	0	1	—	—	Bool	1
48	R	DI_AlarmCODE29	Alarm indicator with code No. 29	0	1	—	—	Bool	1
49	R	DI_AlarmCODE30	Alarm indicator with code No. 30	0	1	—	—	Bool	1
50	R	DI_AlarmCODE31	Alarm indicator with code No. 31	0	1	—	—	Bool	1
51	R	DI_AlarmCODE32	Alarm indicator with code No. 32	0	1	—	—	Bool	1
52	R	DI_AlarmCODE33	Alarm indicator with code No. 33	0	1	—	—	Bool	1
53	R	DI_AlarmCODE34	Alarm indicator with code No. 34	0	1	—	—	Bool	1
54	R	DI_AlarmCODE35	Alarm indicator with code No. 35	0	1	—	—	Bool	1
55	R	DI_AlarmCODE36	Alarm indicator with code No. 36	0	1	—	—	Bool	1
56	R	DI_AlarmCODE37	Alarm indicator with code No. 37	0	1	—	—	Bool	1
57	R	DI_AlarmCODE38	Alarm indicator with code No. 38	0	1	—	—	Bool	1
58	R	DI_AlarmCODE39	Alarm indicator with code No. 39	0	1	—	—	Bool	1
59	R	DI_AlarmCODE40	Alarm indicator with code No. 40	0	1	—	—	Bool	1
60	R	DI_AlarmCODE41	Alarm indicator with code No. 41	0	1	—	—	Bool	1
61	R	DI_AlarmCODE42	Alarm indicator with code No. 42	0	1	—	—	Bool	1
62	R	DI_AlarmCODE43	Alarm indicator with code No. 43	0	1	—	—	Bool	1
63	R	DI_AlarmCODE44	Alarm indicator with code No. 44	0	1	—	—	Bool	1
64	R	DI_AlarmCODE45	Alarm indicator with code No. 45	0	1	—	—	Bool	1
65	R	DI_AlarmCODE46	Alarm indicator with code No. 46	0	1	—	—	Bool	1
66	R	DI_AlarmCODE47	Alarm indicator with code No. 47	0	1	—	—	Bool	1
67	R	DI_AlarmCODE48	Alarm indicator with code No. 48	0	1	—	—	Bool	1
68	R	DI_AlarmCODE49	Alarm indicator with code No. 49	0	1	—	—	Bool	1
69	R	DI_AlarmCODE50	Alarm indicator with code No. 50	0	1	—	—	Bool	1
70	R	DI_AlarmCODE51	Alarm indicator with code No. 51	0	1	—	—	Bool	1
71	R	DI_AlarmCODE52	Alarm indicator with code No. 52	0	1	—	—	Bool	1
Input Registers (16-bit registers) - modbus functions: 4									
0	R	IR_CurSelTEMP	Current temperature of the selected sensor, which controls the air temperature (see HR53). Value 250 = 25.0 °C. -32768 - no sensor, +32767 - short circuit	-32768	+32767	—	°C	Short Int	1
1	R	IR_CurTEMP_SuAirIn	Current temperature of the main outdoor air sensor before preheating. Value 250 = 25.0 °C. -32768 - no sensor, +32767 - short circuit	-32768	+32767	—	°C	Short Int	1
2	R	IR_CurTEMP_SuAirOut	Current temperature of the main supply air temperature sensor at the unit outlet downstream of the reheater. Value 250 = 25.0 °C. -32768 - no sensor, +32767 - short circuit	-32768	+32767	—	°C	Short Int	1
3	R	IR_CurTEMP_ExAirIn	Current extract air temperature at the unit inlet. Value 250 = 25.0 °C. -32768 - no sensor, +32767 - short circuit	-32768	+32767	—	°C	Short Int	1
4	R	IR_CurTEMP_ExAirOut	Current exhaust air temperature at the unit outlet. Value 250 = 25.0 °C. -32768 - no sensor, +32767 - short circuit	-32768	+32767	—	°C	Short Int	1
5	R	IR_CurTEMP_Ext	Current temperature of the outdoor air temperature sensor (in the control panel, ...). Value 250 = 25.0 °C. -32768 - no sensor, +32767 - short circuit	-32768	+32767	—	°C	Short Int	1
8	R	IR_CurTEMP_Water	Return heat medium temperature. Value 250 = 25.0 °C. -32768 - no sensor, +32767 - short circuit	-32768	+32767	—	°C	Short Int	1
9	R	IR_CurVBAT	Current battery voltage for RTC.	0	5000	—	mV	Unsigned Short Int	1
10	R	IR_CurRH_Int	Current humidity of the main sensor. 0 – no sensor	0	100	—	%	Byte	1
11	R	IR_CurRH_Ext	Current humidity of the outdoor sensor. 0 – no sensor	0	100	—	%	Byte	1
12	R	IR_CurCO2_Int	Current CO ₂ level of the main sensor. 0 – no sensor	0	10000	—	ppm	Unsigned Short Int	1
13	R	IR_CurCO2_Ext	Current CO ₂ level of the external sensor. 0 – no sensor	0	10000	—	ppm	Unsigned Short Int	1
14	R	IR_CurPM2_5_Int	Current PM2.5 level of the main sensor. 0 – no sensor	0	1000	—	µg/m ³	Unsigned Short Int	1
15	R	IR_CurPM2_5_Ext	Current PM2.5 level of the external sensor. 0 – no sensor	0	1000	—	µg/m ³	Unsigned Short Int	1
16	R	IR_CurVOC_Int	Current VOC level of the main sensor. 0 – no sensor	0	100	—	%	Byte	1
17	R	IR_CurVOC_Ext	Current VOC level of the external sensor. 0 – no sensor	0	100	—	%	Byte	1
18	R	IR_Cur10V_SENSOR	Current value of the 0-10 V sensor	0	100	—	%	Unsigned Short Int	1
19	R	IR_CurSuAirFLOW	Current supply air flow	0	10000	—	m ³ /h	Unsigned Short Int	1
20	R	IR_CurExAirFLOW	Current exhaust air flow	0	10000	—	m ³ /h	Unsigned Short Int	1
21	R	IR_CurSuPRESS	Current pressure in the supply air duct	0	10000	—	Pa	Unsigned Short Int	1
22	R	IR_CurExPRESS	Current pressure in the exhaust air duct	0	10000	—	Pa	Unsigned Short Int	1

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension	
23	R	IR_SuRPM	Supply fan speed	0	5000	—	rpm	Unsigned Short Int	1	
24	R	IR_ExRPM	Extract fan speed	0	5000	—	rpm	Unsigned Short Int	1	
25	R	IR_CurTIMER_TIME	Current countdown time of the main timer	0	59	—	Min.	Byte	2	
				0	59	—	Sec.	Byte		
				—				Byte		
				0	23	—	Hours	Byte		
27	R	IR_CurFILTER_TIMER	Countdown time of the filter replacement timer	0	23	—	Hours	Byte	2	
				0	59	—	Min.	Byte		
				0	365	—	Days	Unsigned Short Int		
				0	23	—	Hours	Byte		
29	R	IR_TotalWorkingTime	Motor hours	0	23	—	Hours	Byte	2	
				0	59	—	Min.	Byte		
				0	65535	—	Days	Unsigned Short Int		
31	R	IR_StateFILTER	Filter condition: 0 - clean, 1 - the intake supply filter is clogged, 2 - the extract filter is clogged, 3 - both filters are clogged or the filter replacement timer has gone off (highest priority)	0	3	—	—	Byte	1	
32	R	IR_CurWeekSpeed	Current speed in Weekly schedule mode: 0 - Standby 1 - Speed 1 2 - Speed 2 3 - Speed 3 4 - Speed 4 5 - Speed 5	0	5	—	—	Byte	1	
33	R	IR_CurWeekSetTemp	Current temperature setpoint in Weekly schedule mode: 0 - ventilation only, +15 ... + 30 °C	0	30	—	°C	Byte	1	
34	R	IR_VerMAIN_FMFW	Firmware version	0	255	—	Major	Byte	3	
				0	255	—	Minor	Byte		
			Firmware creation date		1	31	—	Day		Byte
			1	12	—	Month	Byte			
0	65535	—	Year	Unsigned Short Int						
37	R	IR_DeviceTYPE	Device type (controller): 1 – S21	0	65535	—	—	Unsigned Short Int	1	
38	R	IR_ALARM	Alarm/warning indicator: 0 – no 1 – alarm (highest priority) 2 – warning	0	2	—	—	Byte	1	
39	R	IR_RH_U	Control signal from the PID humidity controller	0	100	—	%	Byte	1	
40	R	IR_CO2_U	Control signal from the PID CO ₂ level controller	0	100	—	%	Byte	1	
41	R	IR_PM2_5_U	Control signal from the PID PM2.5 level controller	0	100	—	%	Byte	1	
42	R	IR_VOC_U	Control signal from the PID VOC level controller	0	100	—	%	Byte	1	
43	R	IR_PreHeater_U	Control signal from the PID preheating controller	0	100	—	%	Byte	1	
44	R	IR_MainHeater_U	Control signal from the PID reheating controller	0	100	—	%	Byte	1	
45	R	IR_BPS_ROTOR_U	Control signal from the PID bypass/rotary heat exchanger controller	0	100	—	%	Byte	1	
46	R	IR_KKB_U	Control signal from the PID condenser unit controller	0	100	—	%	Byte	1	
47	R	IR_ReturnWater_U	Control signal from the PID return heat medium controller	0	100	—	%	Byte	1	
48	R	IR_SuAirOutSetTemp	Temperature setpoint in the supply air duct. Calculated automatically when the room sensor or the sensor in the exhaust air duct is selected. Value 250 = 25.0 °C	100	400	—	°C	Short Int	1	
49	R	IR_WaterStandbySetTemp	Return heat medium temperature setpoint during winter in Standby mode. Calculated automatically depending on the outdoor temperature. Value 250 = 25.0 °C	100	400	—	°C	Short Int	1	
50	R	IR_WaterStartSetTemp	Return heat medium temperature setpoint in winter before the air handling unit start-up. Calculated automatically depending on the outdoor temperature. Value 350 = 35.0 °C	300	600	—	°C	Short Int	1	

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension
Holding Register (16-bit registers) - modbus functions: 3, 6, 16									
0	R	HR_VENTILATION_MODE	Ventilation mode: 0 - mode 0 ... 100%, 1 - constant flow, 2 - constant pressure	0	2	1	—	Byte	1
1	R	HR_MaxSPEED_MODE	Maximum permissible speed number	3	5	3	—	Byte	1
2	R/W	HR_SPEED_MODE	Speed number: 1 – Speed 1, 2 – Speed 2, 3 – Speed 3, 4 - Speed 4, 5 - Speed 5, 255 – manual speed setting mode (see HR17)	1	255	1	—	Byte	1
3	R	HR_MinSPEED	Minimum possible fan speed	0	100	30	%	Byte	1
4	R	HR_MaxSPEED	Maximum possible fan speed	0	100	100	%	Byte	1
5	R/W	HR_SuSPEED0	Supply fan speed in Standby mode	0	100	0	%	Byte	1
6	R/W	HR_ExSPEED0	Extract fan speed in Standby mode	0	100	0	%	Byte	1
7	R/W	HR_SuSPEED1	Supply fan speed in Speed 1 mode	0	100	40	%	Byte	1
8	R/W	HR_ExSPEED1	Extract fan speed in Speed 1 mode	0	100	40	%	Byte	1
9	R/W	HR_SuSPEED2	Supply fan speed in Speed 2 mode	0	100	70	%	Byte	1
10	R/W	HR_ExSPEED2	Extract fan speed in Speed 2 mode	0	100	70	%	Byte	1
11	R/W	HR_SuSPEED3	Supply fan speed in Speed 3 mode	0	100	100	%	Byte	1
12	R/W	HR_ExSPEED3	Extract fan speed in Speed 3 mode	0	100	100	%	Byte	1
13	R/W	HR_SuSPEED4	Supply fan speed in Speed 4 mode	0	100	100	%	Byte	1
14	R/W	HR_ExSPEED4	Extract fan speed in Speed 4 mode	0	100	100	%	Byte	1
15	R/W	HR_SuSPEED5	Supply fan speed in Speed 5 mode	0	100	100	%	Byte	1
16	R/W	HR_ExSPEED5	Extract fan speed in Speed 5 mode	0	100	100	%	Byte	1
17	R/W	HR_ManualSPEED	Fan speed in manual speed setting mode The balance between supply and exhaust air corresponds to the current preset speeds 1-5	0	100	50	%	Byte	1
18	R/W	HR_BlowingSPEED	Fan speed while blowing electric heaters	0	100	50	%	Byte	1
19	R/W	HR_Boost_SuSPEED	Supply fan speed in Boost mode	0	100	100	%	Byte	1
20	R/W	HR_Boost_ExSPEED	Extract fan speed in Boost mode	0	100	100	%	Byte	1
21	R/W	HR_FPLC_SuSPEED	Supply fan speed in Fireplace mode	0	100	60	%	Byte	1
22	R/W	HR_FPLC_ExSPEED	Extract fan speed in Fireplace mode	0	100	40	%	Byte	1
23	R	HR_MinAirFLOW	Minimum possible air flow of the unit	0	10000	—	m ³ /h	Unsigned Short Int	1
24	R	HR_MaxAirFLOW	Maximum possible air flow of the unit	0	10000	—	m ³ /h	Unsigned Short Int	1
25	R/W	HR_SuSPEED0_FLOW	Supply air flow in Standby mode	0	10000	—	m ³ /h	Unsigned Short Int	1
26	R/W	HR_ExSPEED0_FLOW	Extract air flow in Standby mode	0	10000	—	m ³ /h	Unsigned Short Int	1
27	R/W	HR_SuSPEED1_FLOW	Supply air flow in Speed 1 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
28	R/W	HR_ExSPEED1_FLOW	Extract air flow in Speed 1 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
29	R/W	HR_SuSPEED2_FLOW	Supply air flow in Speed 2 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
30	R/W	HR_ExSPEED2_FLOW	Extract air flow in Speed 2 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
31	R/W	HR_SuSPEED3_FLOW	Supply air flow in Speed 3 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
32	R/W	HR_ExSPEED3_FLOW	Extract air flow in Speed 3 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
33	R/W	HR_SuSPEED4_FLOW	Supply air flow in Speed 4 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
34	R/W	HR_ExSPEED4_FLOW	Extract air flow in Speed 4 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
35	R/W	HR_SuSPEED5_FLOW	Supply air flow in Speed 5 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
36	R/W	HR_ExSPEED5_FLOW	Extract air flow in Speed 5 mode	0	10000	—	m ³ /h	Unsigned Short Int	1
37	R	HR_MinAirPRESS	Minimum possible pressure in the air duct	0	10000	—	Pa	Unsigned Short Int	1
38	R	HR_MaxAirPRESS	Maximum possible pressure in the air duct	0	10000	—	Pa	Unsigned Short Int	1
39	R/W	HR_SuSPEED0_PRESS	Pressure in the supply air duct in Standby mode	0	10000	—	Pa	Unsigned Short Int	1
40	R/W	HR_ExSPEED0_PRESS	Pressure in the exhaust air duct in Standby mode	0	10000	—	Pa	Unsigned Short Int	1
41	R/W	HR_SuSPEED1_PRESS	Pressure in the supply air duct in Speed 1 mode	0	10000	—	Pa	Unsigned Short Int	1
42	R/W	HR_ExSPEED1_PRESS	Pressure in the exhaust air duct in Speed 1 mode	0	10000	—	Pa	Unsigned Short Int	1

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension
43	R/W	HR_OPERATION_MODE	Unit operation mode: 0 - ventilation only 1 - heating, 2 - cooling, 3 - auto	0	3	3	—	Byte	1
44	R/W	HR_SetTEMP	Room temperature setpoint in normal mode	15	30	23	°C	Byte	1
45	R/W	HR_SetRH	Humidity threshold setpoint	40	80	60	%RH	Byte	1
46	R/W	HR_SetCO2	CO ₂ threshold setpoint	400	2000	1200	ppm	Byte	1
47	R/W	HR_SetPM2_5	PM2.5 threshold setpoint	100	1000	400	µg/m ³	Byte	1
48	R/W	HR_SetVOC	VOC threshold setpoint	20	100	40	%	Byte	1
49	R/W	HR_TIMER_MODE	Timer mode: 0 - Standby, 1 - Speed 1, 2 - Speed 2, 3 - Speed 3, 4 - Speed 4, 5 - Speed 5	0	5	1	—	Byte	1
50	R/W	HR_SetTIMER_TEMP	Room temperature setpoint for the main timer: 0 - ventilation only, +15...+ 30 °C	0	30	23	°C	Byte	1
51	R/W	HR_SetTIMER_TIME	Time setpoint of the main timer	0	23	0	Hours	Byte	1
				0	59	30	Min.	Byte	
52	R/W	HR_SetTEMP_WinterSummer	Transition temperature winter/summer	5	15	7	°C	Byte	1
53	R/W	HR_SetTEMP_SENSOR	Selecting a temperature sensor for controlling room temperature: 0 - in the exhaust air duct, 1 - external sensor in the control panel, 2 - in the supply air duct	0	2	2	—	Byte	1
54	R/W	HR_MainHEATER_TYPE	Main heater type: 0 - turn off, 1 - electric, 2 - water	0	2	—	—	Byte	1
55	R/W	HR_COOLER_TYPE	Cooler control type: 0 - turn off, 1 - discrete, 2 - analogue 0-10 V (integrated)	0	2	—	—	Byte	1
56	R/W	HR_DEF_MODE	Heat exchanger Freeze protection mode: 0 - turn off, 1 - preheating, 2 - bypass/rotor, 3 - fan imbalance	0	3	—	—	Byte	1
57	R	HR_BPS_ROTOR_TYPE	Bypass/rotary heat exchanger type: 0 - not available, 1 - bypass with two-point control, 2 - bypass with analogue control, 3 - rotary heat exchanger with discrete control, 4 - rotary heat exchanger with analogue control, 5 - bypass with three-point control	0	4	—	—	Byte	1
58	R/W	HR_SetFILTER_TIMER	Filter timer setpoint: 0 - turn off the timer, 70...365 days	0	365	90	Days	Unsigned Short Int	1
59	R/W	HR_BoostDelaySwitchingOff	Setpoint of the Boost mode turn-off delay	0	60	0	Min.	Byte	1
60	R/W	HR_BoostDelaySwitchingOn	Setpoint of the Boost mode turn-on delay	0	15	0	Min.	Byte	1
61	R/W	HR_RTC_TIME	RTC time	0	59	—	Min.	Byte	2
				—	—	—	Sec.	Byte	
				—	—	—	—	Byte	
				0	23	—	Hours	Byte	
63	R/W	HR_RTC_CALENDAR	RTC calendar	1	31	—	Day	Byte	2
				1	7	—	Week day	Byte	
				1	12	—	Month	Byte	
				0	99	—	Year	Byte	
65	R/W	HR_MaxCO2_Int	Maximum value of the main CO ₂ sensor	500	10000	2000	ppm	Unsigned Short Int	1
66	R/W	HR_MaxPM2_5_Int	Maximum value of the main PM2.5 sensor	500	10000	1000	µg/m ³	Unsigned Short Int	1
67	R/W	HR_SetMinSuAirOutTEMP	Minimum room supply air temperature control setpoint	5	12	10	°C	Byte	1
68	R/W	HR_MainHeaterMODE	Main heater operation mode: 1 - control 0 - 100 %, 2 - AUTO	1	2	2	—	Byte	1
69	R/W	HR_SetMainHeaterMANUAL	Manual control of the main heater	0	100	50	%	Byte	1
70	R/W	HR_CoolerMODE	Cooler operation mode: 1 - turn on the cooler with discrete configuration, control 0-100 % with analogue configuration, 2 - AUTO	1	2	2	—	Byte	1
71	R/W	HR_SetCoolerMANUAL	Manual cooler control with analogue configuration	0	100	0	%	Byte	1
72	R/W	HR_PreHeaterMODE	Preheating operation mode: 1 - control 0 - 100 %, 2 - AUTO	1	2	2	—	Byte	1
73	R/W	HR_SetPreHeaterMANUAL	Manual preheating control	0	100	50	%	Byte	1
74	R/W	HR_BPS_ROTOR_MODE	Bypass/rotary heat exchanger operation mode: 0 - close the bypass/start the rotor, 1 - open the bypass/stop the rotor with discrete configuration, control 0-100 % with analogue configuration, 2 - AUTO	0	2	2	—	Byte	1
75	R/W	HR_SetBpsRotorMANUAL	Manual bypass/rotor control with analogue configuration: 0 % - bypass closed/rotor rotates at maximum speed, 100 %/bypass open, rotor stopped	0	100	100	%	Byte	1
76	R/W	HR_RH_Kp	Kp coefficient of the PID humidity controller	0	1000	150	—	Unsigned Short Int	1
77	R/W	HR_RH_Ki	Ki coefficient of the PID humidity controller	0	1000	150	—	Unsigned Short Int	1
78	R/W	HR_RH_Kd	Kd coefficient of the PID humidity controller	0	1000	0	—	Unsigned Short Int	1
79	R/W	HR_CO2_Kp	Kp coefficient of the PID CO ₂ level controller	0	1000	150	—	Unsigned Short Int	1

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension
80	R/W	HR_CO2_Ki	Ki coefficient of the PID CO ₂ level controller	0	1000	150	—	Unsigned Short Int	1
81	R/W	HR_CO2_Kd	Kd coefficient of the PID CO ₂ level controller	0	1000	0	—	Unsigned Short Int	1
82	R/W	HR_PM2_5_Kp	Kp coefficient of the PID PM2.5 level controller	0	1000	150	—	Unsigned Short Int	1
83	R/W	HR_PM2_5_Ki	Ki coefficient of the PID PM2.5 level controller	0	1000	150	—	Unsigned Short Int	1
84	R/W	HR_PM2_5_Kd	Kd coefficient of the PID PM2.5 level controller	0	1000	0	—	Unsigned Short Int	1
85	R/W	HR_VOC_Kp	Kp coefficient of the PID VOC level controller	0	1000	150	—	Unsigned Short Int	1
86	R/W	HR_VOC_Ki	Ki coefficient of the PID VOC level controller	0	1000	150	—	Unsigned Short Int	1
87	R/W	HR_VOC_Kd	Kd coefficient of the PID VOC level controller	0	1000	0	—	Unsigned Short Int	1
88	R/W	HR_PreHeater_Kp	Kp coefficient of the PID preheating controller	0	1000	200	—	Unsigned Short Int	1
89	R/W	HR_PreHeater_Ki	Ki coefficient of the PID preheating controller	0	1000	200	—	Unsigned Short Int	1
90	R/W	HR_PreHeater_Kd	Kd coefficient of the PID preheating controller	0	1000	500	—	Unsigned Short Int	1
91	R/W	HR_MainHeater_Kp	Kp coefficient of the PID reheating controller	0	1000	400	—	Unsigned Short Int	1
92	R/W	HR_MainHeater_Ki	Ki coefficient of the PID reheating controller	0	1000	400	—	Unsigned Short Int	1
93	R/W	HR_MainHeater_Kd	Kd coefficient of the PID reheating controller	0	1000	600	—	Unsigned Short Int	1
94	R/W	HR_BPS_ROTOR_Kp	Kp coefficient of the PID bypass/rotary heat exchanger controller	0	1000	200	—	Unsigned Short Int	1
95	R/W	HR_BPS_ROTOR_Ki	Ki coefficient of the PID bypass/rotary heat exchanger controller	0	1000	200	—	Unsigned Short Int	1
96	R/W	HR_BPS_ROTOR_Kd	Kd coefficient of the PID bypass/rotary heat exchanger controller	0	1000	500	—	Unsigned Short Int	1
97	R/W	HR_KKB_Kp	Kp coefficient of the PID condenser unit controller	0	1000	200	—	Unsigned Short Int	1
98	R/W	HR_KKB_Ki	Ki coefficient of the PID condenser unit controller	0	1000	200	—	Unsigned Short Int	1
99	R/W	HR_KKB_Kd	Kd coefficient of the PID condenser unit controller	0	1000	500	—	Unsigned Short Int	1
100	R/W	HR_ReturnWater_Kp	Kp coefficient of the PID return heat medium controller	0	1000	120	—	Unsigned Short Int	1
101	R/W	HR_ReturnWater_Ki	Ki coefficient of the PID return heat medium controller	0	1000	120	—	Unsigned Short Int	1
102	R/W	HR_ReturnWater_Kd	Kd coefficient of the PID return heat medium controller	0	1000	350	—	Unsigned Short Int	1
103	R	HR_FanAlarmCTRL	Fan alarm control type: 0 - no alarm control, 1...254 - number of tacho pulses per fan rotation, 255 - fan alarm control using a differential pressure switch	0	255	2	—	Byte	1
104	R	HR_SetTimeDetectFanALARM	Time for fan alarm detection	5	120	30	Sec.	Byte	1
105	R/W	HR_SetTimeOpenVALVE	Damper opening time (fan turn-on delay)	0	240	0	Sec.	Byte	1
106	R/W	HR_SetTimeFanBLOWING	Electric heater blowdown time	20	240	120	Sec.	Byte	1
107	R/W	HR_KKB_MinTimeOFF	Minimum downtime of the condenser unit before restarting	0	20	3	Min.	Byte	1
108	R/W	HR_KKB_MinTimeON	Minimum operating time of the condenser unit before shutdown	0	20	1	Min.	Byte	1
109	R/W	HR_KKB_HYSTERESIS	Hysteresis for turning the condenser unit on/off with discrete control	1	10	2	°C	Byte	1
110	R	HR_BPS_Position	Bypass location: 0 - from outdoors, 1 - from indoors	0	1	—	—	Byte	1
111	R	HR_TimeOpenBPS	Opening time of the bypass with three-point control	2	300	—	Sec.	Byte	1
112	R/W	HR_CorrTEMP_SuAirIn	Correction of the intake air temperature sensor at the unit inlet. Value 250 = 25.0 °C	-500	+500	0	°C	Short Int	1
113	R/W	HR_CorrTEMP_SuAirOut	Correction of the supply air temperature sensor at the unit outlet (downstream of the heat exchanger/downstream of the heater). Value 250 = 25.0 °C	-500	+500	0	°C	Short Int	1
114	R/W	HR_CorrTEMP_ExAirIn	Correction of the extract air temperature sensor at the unit inlet. Value 250 = 25.0 °C	-500	+500	0	°C	Short Int	1
115	R/W	HR_CorrTEMP_ExAirOut	Correction of the exhaust air temperature sensor at the unit outlet. Value 250 = 25.0 °C	-500	+500	0	°C	Short Int	1
116	R/W	HR_CorrTEMP_Water	Correction of the return heat medium temperature sensor. Value 250 = 25.0 °C	-500	+500	0	°C	Short Int	1
117	R/W	HR_CorrTEMP_Ext	Correction of the outdoor air temperature sensor Value 250 = 25.0 °C	-500	+500	0	°C	Short Int	1
118	R/W	HR_WaterValveMinPos	Minimum position of the water heater valve in winter	0	100	0	%	Byte	1

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension
119	R/W	HR_WaterMaxStartTime	Time for detecting return heat medium underheating alarm before the AHU start in winter	2	30	5	Min.	Byte	1
120	R/W	HR_WaterMinStartTemp	Initial value of the return heat medium temperature required for the AHU start in winter at outdoor temperature $\geq +10$ °C	30	60	30	°C	Short Int	1
121	R/W	HR_WaterMaxStartTemp	Final value of the return heat medium temperature required for the AHU start in winter at outdoor temperature ≤ -30 °C	30	60	50	°C	Short Int	1
122	R/W	HR_WaterMinAlarmTemp	Initial value of the return heat medium temperature for the AHU shutdown caused by a freeze alarm in winter at outdoor temperature $\geq +10$ °C	10	30	12	°C	Short Int	1
123	R/W	HR_WaterMaxAlarmTemp	Final value of the return heat medium temperature for the AHU shutdown caused by a freeze alarm in winter at outdoor temperature ≤ -30 °C	10	30	20	°C	Short Int	1
124	R/W	HR_ENGINEER_PWD	Password to enter the engineering menu. The string should be 1-4 characters long. The end of the string is determined by the Null character	48	57	49	Char	String	2
				48	57	49	Char		
				48	57	49	Char		
				48	57	49	Char		
126	R/W	HR_SetWEEK_Mo	Speed number for Mo. in the 1st time period	0	5	1	—	Byte	1
			Temperature setpoint for Mo. in the 1st period	15	30	23	°C	Byte	
			Hours of the end of the 1st period on Mo.	0	23	6	Hours	Byte	
			Minutes of the end of the 1st period on Mo.	0	59	0	Min.	Byte	
			Speed number for Mo. in the 2nd time period	0	5	1	—	Byte	
			Temperature setpoint for Mo. in the 2nd period	15	30	23	°C	Byte	
			Hours of the end of the 2nd period on Mo.	0	23	9	Hours	Byte	
			Minutes of the end of the 2nd period on Mo.	0	59	0	Min.	Byte	
			Speed number for Mo. in the 3rd time period	0	5	1	—	Byte	
			Temperature setpoint for Mo. in the 3rd period	15	30	23	°C	Byte	
			Hours of the end of the 3rd period on Mo.	0	23	19	Hours	Byte	
			Minutes of the end of the 3rd period on Mo.	0	59	0	Min.	Byte	
130	R/W	HR_SetWEEK_Mo	Speed number for Mo. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for Mo. in the 4th period	15	30	23	°C	Byte	
131	R/W	HR_SetWEEK_Mo	Hours of the end of the 3rd period on Mo.	0	23	19	Hours	Byte	1
			Minutes of the end of the 3rd period on Mo.	0	59	0	Min.	Byte	
132	R/W	HR_SetWEEK_Mo	Speed number for Mo. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for Mo. in the 4th period	15	30	23	°C	Byte	
133	R	HR_SetWEEK_Mo	Reserved. The end of the 4th period is always at 23:59	0	23	23	Hours	Byte	1
				0	59	59	Min.	Byte	
134	R/W	HR_SetWEEK_Tu	Speed number for Tu. in the 1st time period	0	5	1	—	Byte	1
			Temperature setpoint for Tu. in the 1st period	15	30	23	°C	Byte	
			Hours of the end of the 1st period on Tu.	0	23	6	Hours	Byte	
			Minutes of the end of the 1st period on Tu.	0	59	0	Min.	Byte	
			Speed number for Tu. in the 2nd time period	0	5	1	—	Byte	
			Temperature setpoint for Tu. in the 2nd period	15	30	23	°C	Byte	
			Hours of the end of the 2nd period on Tu.	0	23	9	Hours	Byte	
			Minutes of the end of the 2nd period on Tu.	0	59	0	Min.	Byte	
			Speed number for Tu. in the 3rd time period	0	5	1	—	Byte	
			Temperature setpoint for Tu. in the 3rd period	15	30	23	°C	Byte	
			Hours of the end of the 3rd period on Tu.	0	23	19	Hours	Byte	
			Minutes of the end of the 3rd period on Tu.	0	59	0	Min.	Byte	
140	R/W	HR_SetWEEK_Tu	Speed number for Tu. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for Tu. in the 4th period	15	30	23	°C	Byte	
141	R	HR_SetWEEK_Tu	Reserved. The end of the 4th period is always at 23:59	0	23	23	Hours	Byte	1
				0	59	59	Min.	Byte	
142	R/W	HR_SetWEEK_We	Speed number for We. in the 1st time period	0	5	1	—	Byte	1
			Temperature setpoint for We. in the 1st period	15	30	23	°C	Byte	
			Hours of the end of the 1st period on We. 0 23 6 Hours Byte 1	0	23	6	Hours	Byte	
			Minutes of the end of the 1st period on We.	0	59	0	Min.	Byte	
			Speed number for We. in the 2nd time period	0	5	1	—	Byte	
			Temperature setpoint for We. in the 2nd period	15	30	23	°C	Byte	
			Hours of the end of the 2nd period on We.	0	23	9	Hours	Byte	
			Minutes of the end of the 2nd period on We.	0	59	0	Min.	Byte	
			Speed number for We. in the 3rd time period	0	5	1	—	Byte	
			Temperature setpoint for We. in the 3rd period	15	30	23	°C	Byte	
			Hours of the end of the 3rd period on We.	0	23	19	Hours	Byte	
			Minutes of the end of the 3rd period on We.	0	59	0	Min.	Byte	
147	R/W	HR_SetWEEK_We	Speed number for We. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for We. in the 4th period	15	30	23	°C	Byte	
149	R	HR_SetWEEK_We	Reserved. The end of the 4th period is always at 23:59	0	23	23	Hours	Byte	1
				0	59	59	Min.	Byte	

Address	R/W	Variable	Description	Minimum value	Maximum value	Pre-set value	Measurement units	Model	Dimension
150	R/W	HR_SetWEEK_Th	Speed number for Th. in the 1st time period	0	5	1	—	Byte	1
			Temperature setpoint for Th. in the 1st period	0	30	23	°C	Byte	
151	R/W		Hours of the end of the 1st period on Th.	0	23	6	Hours	Byte	1
			Minutes of the end of the 1st period on Th.	0	59	0	Min.	Byte	
152	R/W		Speed number for Th. in the 2nd time period	0	5	1	—	Byte	1
			Temperature setpoint for Th. in the 2nd period	0	30	23	°C	Byte	
153	R/W		Hours of the end of the 2nd period on Th.	0	23	9	Hours	Byte	1
			Minutes of the end of the 2nd period on Th.	0	59	0	Min.	Byte	
154	R/W		Speed number for Th. in the 3rd time period	0	5	1	—	Byte	1
			Temperature setpoint for Th. in the 3rd period	0	30	23	°C	Byte	
155	R/W		Hours of the end of the 3rd period on Th.	0	23	19	Hours	Byte	1
			Minutes of the end of the 3rd period on Th.	0	59	0	Min.	Byte	
156	R/W		Speed number for Th. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for Th. in the 4th period	0	30	23	°C	Byte	
157	R	Reserved. The end of the 4th period is always at 23:59	0	23	23	Hours	Byte	1	
			0	59	59	Min.	Byte		
158	R/W	HR_SetWEEK_Fr	Speed number for Fr. in the 1st time period	0	5	1	—	Byte	1
			Temperature setpoint for Fr. in the 1st period	0	30	23	°C	Byte	
159	R/W		Hours of the end of the 1st period on Fr.	0	23	6	Hours	Byte	1
			Minutes of the end of the 1st period on Fr.	0	59	0	Min.	Byte	
160	R/W		Speed number for Fr. in the 2nd time period	0	5	1	—	Byte	1
			Temperature setpoint for Fr. in the 2nd period	0	30	23	°C	Byte	
161	R/W		Hours of the end of the 2nd period on Fr.	0	23	9	Hours	Byte	1
			Minutes of the end of the 2nd period on Fr.	0	59	0	Min.	Byte	
162	R/W		Speed number for Fr. in the 3rd time period	0	5	1	—	Byte	1
			Temperature setpoint for Fr. in the 3rd period	0	30	23	°C	Byte	
163	R/W		Hours of the end of the 3rd period on Fr.	0	23	19	Hours	Byte	1
			Minutes of the end of the 3rd period on Fr.	0	59	0	Min.	Byte	
164	R/W		Speed number for Fr. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for Fr. in the 4th period	0	30	23	°C	Byte	
165	R	Reserved. The end of the 4th period is always at 23:59	0	23	23	Hours	Byte	1	
			0	59	59	Min.	Byte		
166	R/W	HR_SetWEEK_Sa	Speed number for Sa. in the 1st time period	0	5	1	—	Byte	1
			Temperature setpoint for Sa. in the 1st period	0	30	23	°C	Byte	
167	R/W		Hours of the end of the 1st period on Sa.	0	23	6	Hours	Byte	1
			Minutes of the end of the 1st period on Sa.	0	59	0	Min.	Byte	
168	R/W		Speed number for Sa. in the 2nd time period	0	5	1	—	Byte	1
			Temperature setpoint for Sa. in the 2nd period	0	30	23	°C	Byte	
169	R/W		Hours of the end of the 2nd period on Sa.	0	23	9	Hours	Byte	1
			Minutes of the end of the 2nd period on Sa.	0	59	0	Min.	Byte	
170	R/W		Speed number for Sa. in the 3rd time period	0	5	1	—	Byte	1
			Temperature setpoint for Sa. in the 3rd period	0	30	23	°C	Byte	
171	R/W		Hours of the end of the 3rd period on Sa.	0	23	19	Hours	Byte	1
			Minutes of the end of the 3rd period on Sa.	0	59	0	Min.	Byte	
172	R/W		Speed number for Sa. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for Sa. in the 4th period	0	30	23	°C	Byte	
173	R	Reserved. The end of the 4th period is always at 23:59	0	23	23	Hours	Byte	1	
			0	59	59	Min.	Byte		
174	R/W	HR_SetWEEK_Su	Speed number for Su. in the 1st time period	0	5	1	—	Byte	1
			Temperature setpoint for Su. in the 1st period	0	30	23	°C	Byte	
175	R/W		Hours of the end of the 1st period on Su.	0	23	6	Hours	Byte	1
			Minutes of the end of the 1st period on Su.	0	59	0	Min.	Byte	
176	R/W		Speed number for Su. in the 2nd time period	0	5	1	—	Byte	1
			Temperature setpoint for Su. in the 2nd period	0	30	23	°C	Byte	
177	R/W		Hours of the end of the 2nd period on Su.	0	23	9	Hours	Byte	1
			Minutes of the end of the 2nd period on Su.	0	59	0	Min.	Byte	
178	R/W		Speed number for Su. in the 3rd time period	0	5	1	—	Byte	1
			Temperature setpoint for Su. in the 3rd period	0	30	23	°C	Byte	
179	R/W		Hours of the end of the 3rd period on Su.	0	23	19	Hours	Byte	1
			Minutes of the end of the 3rd period on Su.	0	59	0	Min.	Byte	
180	R/W		Speed number for Su. in the 4th time period	0	5	1	—	Byte	1
			Temperature setpoint for Su. in the 4th period	0	30	23	°C	Byte	
181	R	Reserved. The end of the 4th period is always at 23:59	0	23	23	Hours	Byte	1	
			0	59	59	Min.	Byte		

