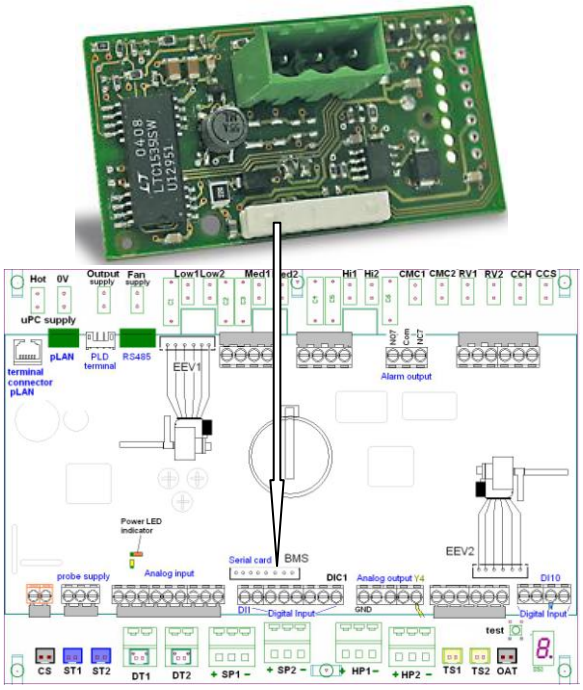
UC6 Modbus Communication Quick Reference Guide (V6.0)

1. Hardware installation:

Standard UC6 controller does not include BMS RS485 Card, customer need purchase it from temperzone separately and the parts number is 201-000-388.

Insert RS485 card into UC6 BMS socket while the UC6 is power off.



2. Modbus Communication Configuration

a. Modbus address: UC6 has default slave address “1”.

b. Baud rate: 19200

c. Stop Bits: 1

d. Parity: Even

To change above parameters you need a “UC6 Service Interface” tool. The parameter settings are located on “Service” menu and “BMS configuration” sub-page.

3. UC6 Supported Modbus Functions

Function	Function code
Read Coils	01
Read Holding Registers	03
Write Single Coil	05
Write Single Register	06
Write Multiple Coils	15
Write Multiple Registers	16

4. Turn On/Off Compressors

Step1. Set digital coil addressed “3” to enable BMS control.

Cooling: (Modbus function 05)

Step2. Set digital coil “15” to turn on indoor fan.

Step3. Set digital coil “10” and “11” to run compressor 1 and compressor2.

Heating:

Set digital coil “12” to heating cycle.

Digital Coil address:	Function	Note
3	Enable BMS Control	BMS_DO_OUT_EN
15	Indoor Fan High	Indoor fan On/OFF switch
10	Compressor1 ON/OFF	CMC1
11	Compressor2 ON/OFF	CMC2
12	Heating	Reverse valve 1/2

Note: Registers and coils address have+1offset.

5. Indoor Fan Speed Control

1. Switched Low/ Medium/ High speed control

Set digital coils “13”, “14” and “15” to activate output terminals Low/Med/ Hi.

Digital Coil address:	Function	Note
13	Indoor Fan Low	
14	Indoor Fan Medium	
15	Indoor Fan High	Also for indoor fan On/Off Switch

2. EC fan speed control

Step1. Set digital coil “5” to enable EC fan speed control (Modbus function 05)

Step2. Write a decimal value (0-1000) to register “2” correspond to fan speed 0-100.0% (Modbus function 06)

Digital Coil address:	Function	Note
5	EC Fan Enable	Modbus function code:05

Register address:	Function	Note
2	EC Fan Speed	Integer 0-1000 correspond to fan speed 0-100% (Modbus function code 06)

6. Compressor Capacity control:

If a variable capacity compressor fitted in the system for instance digital scrolled compressor or BLDC compressor, BMS can control the capacity. Set Coil “4” to enable capacity control.

Digital Coil address:	Function	Note
4	Enable Capacity control	Modbus function code:05

Holding Register address “1” is used for the compressor capacity control

Register address:	Function	Note
1	BMS required compressor capacity Integer value 0-1000 corresponds to 0-100%	Modbus function code 06

7. Read parameters:

Use Modbus function 03 to read system parameters, the register address list at below table:

Register address	Description	Unit
20	System1 suction temperature	°C
21	System1 suction pressure	bar
22	System1 suction superheat	K
23	System1 evaporating temperature	°C
24	System1 discharge temperature	°C
25	System1 discharge pressure	bar
26	System1 discharge superheat	K
27	System1 condenser temperature	°C
28	Electronics expansion valve A steps	integer
29	System1 outdoor fan speed	0-1000
30	System1 outdoor coil temperature	°C
31	System1 status	integer
40	System2 suction temperature	°C
41	Systme2 evaporate pressure	bar
42	Systme2 suction superheat	K
43	Systme2 evaporator temperature	°C
44	Systme2 discharge temperature	°C
45	Systme2 discharge pressure	bar
46	Systme2 discharge superheat	K
47	Systme2 condenser temperature	°C
48	Electronics expansion valve B steps	integer
49	Systme2 outdoor fan speed	0-1000
50	Systme2 outdoor coil temperature (deice sensor)	°C
51	System2 status	
72	Ambient temperature	°C
73	Current capacity	0-1000
74	Indoor fan speed	0-1000
75	BLDC actual speed	rmp
76	BLDC motor power	Kwh

8. Read System Status

a. Read system status from register (31) and (51) return an integer value:

Register 31 value (integer)	System1 status:	Register 51 value (integer)	System2 status:
1	minimum on	1	minimum on
2	minimum off	2	minimum off
3	cooling	3	cooling
4	heating	4	heating
5	De-ice	5	De-ice
11	LP	11	LP
12	HP	12	HP
13	HiST	13	HiST
14	Frost	14	Frost
15	HT	15	HT
16	loss of charge	16	loss of charge
17	LP lockout	17	LP lockout
18	Hp lockout	18	Hp lockout
19	Hist lockout	19	Hist lockout
20	Frost lockout	20	Frost lockout
21	HT lockout	21	HT lockout
22	loss of charge lockout	22	loss of charge lockout
23	BLDC		
24	Inverter		
25	Inverter lockout		

b. Read system status from digital coils (function 01)

System status can also be read from digital coils by function 01. Below table listed the coil address and its representations.

Digital Coil address	Description	Note
41	Fan low	
42	Fan medium	
43	Fan high	
44	Reversing Valve1 Run Status	
45	Compressor1 Status	1:On; 0:OFF
46	Compressor2 status	1:On; 0:OFF
47	Alarm	1: Alarm; 0: Normal
48	Crank case heater	1:On; 0:OFF
51	Dout_11 Reversing Valve2 Run Status	1:Energized; 0:de-energized
52	Digital scroll compressor modulation valve status	
53	System1 in de-ice mode	1: de-ice; 0:normal
54	System2 in de-ice mode	1:de-ice; 0:normal
55	Cooling	
56	Heating	
62	Unit in Service mode	

9. Reset system alarm

Digital Coil address:	Function	Note
20	Reset System1 alarm	Set this bit at least 3 seconds to allow UC6 reset the alarms
21	Reset System2 alarm	

10. Other information: (Modbus function 03)

Register address	Description	Note
32	Compressor 1 Run Hours least significant byte	Three low digits number of compressor 1 run hours
33	Compressor 1 Run Hours most significant byte	Three high digits number of compressor1 run hours
34	Compressor1 heating cycle least significant byte	
35	Compressor1 heating cycle most significant byte	
36	Compressor1 cooling cycle least significant byte	
37	Compressor1 cooling cycle most significant byte	
52	Compressor2 Run Hours least byte	Three low digits number of compressor 2 run hours
53	Compressor2 Run Hours most byte	Three high digits number of compressor2 run hours
54	Compressor2 heating cycle least byte	
55	Compressor2 heating cycle most byte	
56	Compressor2 cooling cycle least byte	
57	Compressor2 cooling cycle most	
	Real time clock	
61	Current time seconds	
62	Current time minutes	
63	Current time hours	
64	Current time days	
65	Current time months	
66	Current time years	