

STULZ

GmbH Klimatechnik

Monitoring Dataprotocoll

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General Information

All STULZ controllers are equipped with an (optional) RS-485 interface, which is used for the described data protocol. The maximum number of controllers connected via the RS-485 bus is 31. The communication with a controller is based on the master/slave principle. Which means a controller will only send data via the bus line if the data has been requested by a master (BMS, Monitoring System).

The transmission parameters are fixed to the following settings:

- 9600 baud
- 8 data bits
- NO parity
- 1 stop bit

Message Format

0	1	2	3..nn	nn-1	nn
ID	CMD	LEN	DATA-bytes	CS-LB	CS-HB

- ID controller id (1..255)
- CMD command id
- LEN number of following bytes including the checksum
- DATA data bytes depending on the command byte value (optional)
- CS-LB low byte checksum
- CS-HB high byte checksum

The 16 bit checksum is the 2s-complement of the sum of all bytes excluding the checksum bytes. $checksum = complement(sum(byte 0.. byte nn-2)) + 1$

Examples:

Request 'Long Status' from controller number 1.

01	01	02	FF	FF
----	----	----	----	----

The answer from controller number 1 could be:

01	01	89	data	data	E7	A5
----	----	----	------	------	----	----

Request 'Short Status' from controller number 5.

05	07	03	02	EF	FE
----	----	----	----	----	----

The answer from controller number 5 could be:

05	07	03	0F	EF	FE
----	----	----	----	----	----

(-> unit is in operation , no alarm condition)

1 long status

Long Status Request

Long Status Request (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		1	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	0..255		X	X	X
4	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

Long Status Request (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		1	X	X	X
2	number of following bytes		137	X	X	X
3	LB watertemperature -input-	-50.0..+50.0 °C	-500..+500		X	X
4	HB %					
5	LB return air temperature -input-	0.0..100.0°C	0..1000	X	X	X
6	HB %					
7	LB supply air temperature -input-	0.0..100.0°C	0..1000		X	X
8	HB %					
9	LB return air humidity -input-	0.0..100.0%	0..1000	X	X	X
10	HB %					
11	LB supply air humidity -input-	0.0..100.0%	0..1000		X	X
12	HB %					
13	LB outside air temperature -input-	-50.0..+50.0 °C	-500..+500		X	X
14	HB %					
15	LB outside air humidity -input-	0.0..100.0%	0..1000		X	X
16	HB %					
17	temperature setpoint shift (±12.7°C)	±127	-127..+127		X	X
18	humidity setpoint shift (±12.7%)	±127	-127..+127		X	X
19	- reserved -					
20	- reserved -					
21	- reserved -					
22	- reserved -					
23	- reserved -					
24	- reserved - / SW-Version ?				X	
25	module 1 digital out status byte 1	bit-coded	see table	X	X	X
26	module 1 digital out status byte 2	bit-coded	see table	X	X	X
27	module 2 digital out status byte 1	bit-coded	see table	X	X	X
28	module 2 digital out status byte 2	bit-coded	see table	X	X	X
29	module 3 digital out status byte 1	bit-coded	see table		X	X
30	module 3 digital out status byte 2	bit-coded	see table		X	X
31	module 4 digital out status byte 1	bit-coded	see table		X	X
32	module 4 digital out status byte 2	bit-coded	see table		X	X
33	module 1 digital in status byte 1	bit-coded	see table	X	X	X
34	module 1 digital in status byte 2	bit-coded	see table	X	X	X
35	module 2 digital in status byte 1	bit-coded	see table	X	X	X
36	module 2 digital in status byte 2	bit-coded	see table		X	X
37	module 3 digital in status byte 1	bit-coded	see table		X	X
38	module 3 digital in status byte 2	bit-coded	see table		X	X
39	module 4 digital in status byte 1	bit-coded	see table		X	X

1 long status

40	module 4 digital in status byte 2	bit-coded	see table		X	X
41	analogue out GE/CW valve (module 1)	0-100%	0.255	X	X	X
42	analogue out PWW heating (module 1)	0-100%	0.255		X	X
43	analogue out humidifier (module 1)	0-100%	0.255		X	X
44	analogue out suction valve module 1	0-100%	0.255		X	X
45	analogue out suction valve module 2	0-100%	0.255		X	X
46	analogue out suction valve module 3	0-100%	0.255		X	X
47	analogue out suction valve module 4	0-100%	0.255		X	X
48	setpoint temperature	10.0-35.0°C	0.250	X	X	X
49	setpoint humidity	10-90%	10.90	X	X	X
50	year	0..99	0.99		X	X
51	month	1..12	1.12		X	X
52	day	1..31	1.31		X	X
53	hour	0..23	0.23		X	X
54	minute	0..59	0.59		X	X
55	return air temp. too high alarm	0..30°C	0.30	X	X	X
56	supply air temp. too high alarm	0..30°C	0.30		X	X
57	return air temp. too low alarm	0..30°C	0.30	X	X	X
58	supply air temp. too low alarm	0..30°C	0.30		X	X
59	water temp. too high alarm	0..50°C	0.50		X	X
60	water temp. too low alarm	-50..+30°C	0.80		X	X
61	return air humid. too high alarm	0..90%	0.90	X	X	X
62	supply air humid. too high alarm	0..90%	0.90		X	X
63	return air humid. too low alarm	0..90%	0.90	X	X	X
64	supply air humid. too low alarm	0..90%	0.90		X	X
----- data module 1 -----						
65	compressor start (setpoint + val)	0.0..10.0 K	0.100	X	X	X
66	compressor hysteresis	0.0..10.0 K	0.100	X	X	X
67	suction valve start	0.0..10.0 K	0.100		X	X
68	suction valve proportional band	0.0..10.0 K	0.100		X	X
69	drycooler start temperature	0..45°C	0.45		X	X
70	drycooler enable temperature	0..45°C	0.45		X	
71	glycol-pump start temperature	0.0..10.0 K	0.100		X	X
72	GE/CW valve off temperature	0..35°C	0.35		X	X
73	GE/CW valve start temperature	0.0..10.0 K	0.100	X	X	X
74	GE/CW valve proportional band	0.0..10.0 K	0.100	X	X	X
75	reheat 1 start temperature	0.0..10.0 K	0.100	X	X	X
76	reheat 1 hysteresis	0.0..10.0 K	0.100	X	X	X
77	reheat 2 start temperature	0.0..10.0 K	0.100	X	X	X
78	reheat 2 hysteresis	0.0..10.0 K	0.100	X	X	X
79	reheat 3 start temperature	0.0..10.0 K	0.100		X	X
80	reheat 3 hysteresis	0.0..10.0 K	0.100		X	X
81	PWW valve start temperature	0.0..10.0 K	0.100		X	X
82	PWW valve proportional band	0.0..10.0 K	0.100		X	X
83	dehumidification start	0..90%	0.90	X	X	X
84	dehumidification hysteresis	0..90%	0.90	X	X	X
85	humidification start	0..90%	0.90	X	X	X
86	humidification hysteresis	0..90%	0.90	X	X	X
87	humidification start (analogue)	0..90%	0.90		X	X
88	humidification proportional band (analogue)	0..90%	0.90		X	X
----- data module 2 -----						
89	compressor start (setpoint + val)	0.0..10.0 K	0.100	X	X	X
90	compressor hysteresis	0.0..10.0 K	0.100	X	X	X
91	suction valve start	0.0..10.0 K	0.100		X	X
92	suction valve proportional band	0.0..10.0 K	0.100		X	X
93	drycooler start temperature	0..45°C	0.45		X	X
94	reheat 1 start temperature	0.0..10.0 K	0.100	X	X	X

1 long status

95	reheat 1 hysteresis	0.0..10.0 K	0..100	X	X	X
96	reheat 2 start temperature	0.0..10.0 K	0..100	X	X	X
97	reheat 2 hysteresis	0.0..10.0 K	0..100	X	X	X
98	reheat 3 start temperature	0.0..10.0 K	0..100		X	X
99	reheat 3 hysteresis	0.0..10.0 K	0..100		X	X
100	dehumidification start	0..90%	0..90	X	X	X
101	dehumidification hysteresis	0..90%	0..90	X	X	X
102	humidification start	0..90%	0..90	X	X	X
103	humidification hysteresis	0..90%	0..90	X	X	X
data module 3						
104	compressor start (setpoint + val)	0.0..10.0 K	0..100	X	X	X
105	compressor hysteresis	0.0..10.0 K	0..100	X	X	X
106	suction valve start	0.0..10.0 K	0..100		X	X
107	suction valve proportional band	0.0..10.0 K	0..100		X	X
108	drycooler start temperature	0..45°C	0..45		X	X
109	reheat 1 start temperature	0.0..10.0 K	0..100	X	X	X
110	reheat 1 hysteresis	0.0..10.0 K	0..100	X	X	X
111	reheat 2 start temperature	0.0..10.0 K	0..100	X	X	X
112	reheat 2 hysteresis	0.0..10.0 K	0..100	X	X	X
113	reheat 3 start temperature	0.0..10.0 K	0..100		X	X
114	reheat 3 hysteresis	0.0..10.0 K	0..100		X	X
115	dehumidification start	0..90%	0..90	X	X	X
116	dehumidification hysteresis	0..90%	0..90	X	X	X
117	humidification start	0..90%	0..90	X	X	X
118	humidification hysteresis	0..90%	0..90	X	X	X
data module 4						
119	compressor start (setpoint + val)	0.0..10.0 K	0..100	X	X	X
120	compressor hysteresis	0.0..10.0 K	0..100	X	X	X
121	suction valve start	0.0..10.0 K	0..100		X	X
122	suction valve proportional band	0.0..10.0 K	0..100		X	X
123	drycooler start temperature	0..45°C	0..45		X	X
124	reheat 1 start temperature	0.0..10.0 K	0..100	X	X	X
125	reheat 1 hysteresis	0.0..10.0 K	0..100	X	X	X
126	reheat 2 start temperature	0.0..10.0 K	0..100	X	X	X
127	reheat 2 hysteresis	0.0..10.0 K	0..100	X	X	X
128	reheat 3 start temperature	0.0..10.0 K	0..100		X	X
129	reheat 3 hysteresis	0.0..10.0 K	0..100		X	X
130	dehumidification start	0..90%	0..90	X	X	X
131	dehumidification hysteresis	0..90%	0..90	X	X	X
132	humidification start	0..90%	0..90	X	X	X
133	humidification hysteresis	0..90%	0..90	X	X	X
general data						
134	general status byte 1	bit-coded	see table	X	X	X
135	general status byte 2	bit-coded	see table	X	X	X
136	error byte 1	bit-coded	see table	X	X	X
137	error byte 2	bit-coded	see table	X	X	X
138	LB checksum	0..255		X	X	X
139	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 137.

Bit #	General Status Byte 1	POS	R / W	C1001/2	C4000	C5000
0	0 = PC-STOP (monitoring), 1 = on	0x01	R/W	X	X	X
1	0 = REMOTE STOP (contact), 1 = on	0x02	R	X	X	X
2	0 = LOCAL STOP (key), 1 = on	0x04	R	X	X	X
3	0 = TIMER-STOP (weekly oper.), 1 = on	0x08	R			X
4	not used	0x10	R			
5	not used	0x20	R			
6	not used	0x40	R			



NOTE: only if bits #0 to #3 are set to 1 the unit is in operation.
 If one of the bits #0,#1,#2,#3 is set to 0 the unit is in STOP condition.

Bit #	General Status Byte 2	POS	R / W	C1001/2	C4000	C5000
0	not used	0x01	R			
1	not used	0x02	R			
2	not used	0x04	R			
3	not used	0x08	R			
4	not used	0x10	R			
5	not used	0x20	R			
6	not used	0x40	R			
7	not used	0x80	R			

Bit #	module x digital OUT status byte 1	POS	R / W	C1001/2	C4000	C5000
0	reheat 1	0x01	R	X	X	X
1	compressor	0x02	R	X	X	X
2	humidification	0x04	R	X	X	X
3	dehumidification	0x08	R	X	X	X
4	fan	0x10	R	X	X	X
5	drycooler	0x20	R		X	X
6	alarm relays #1	0x40	R	X	X	X
7	hot gas reheat / reheat 3	0x80	R		X	X

NOTE: if a bit is set to 1, than the corresponding component is in operation.

Bit #	module x digital OUT status byte 2	POS	R / W	C1001/2	C4000	C5000
0	reheat 2	0x01	R	X	X	X
1	glycol pump	0x02	R		X	X
2	louver (0=closed, 1=open)	0x04	R	X	X	X
3	alarm relays #2	0x08	R		X	X
4	alarm relays #3	0x10	R		X	
5	alarm relays #4	0x20	R		X	
6	alarm relays #5	0x40	R		X	
7	glycol pump 1 / 2 select	0x80	R		X	X

NOTE: if a bit is set to 1, than the corresponding component is in operation.

1 long status

Bit #	module x digital IN status byte 1	POS	R / W	C1001/2	C4000	C5000
0	compressor low pressure	0x01	R	X	X	X
1	compressor high pressure	0x02	R	X	X	X
2	reheat 1 failure	0x04	R	X	X	X
3	humidification failure	0x08	R	X	X	X
4	air flow failure	0x10	R	X	X	X
5	filter clogged	0x20	R	X	X	X
6	aux. alarm #1	0x40	R	X	X	X
7	reheat 2 failure	0x80	R	X	X	X

NOTE: if a bit is set to 1, than the corresponding alarm is active.

Bit #	module x digital IN status byte 2	POS	R / W	C1001/2	C4000	C5000
0	conductivity too high (< 5pS)	0x01	R		X	X
1	ultrasonic failure	0x02	R		X	X
2	glycol pump 1 failure	0x04	R		X	X
3	glycol pump 2 failure	0x08	R		X	X
4	drycooler failure	0x10	R		X	X
5	water detector	0x20	R	X	X	
6	aux. alarm #2	0x40	R		X	X
7	aux. alarm #3	0x80	R		X	X

NOTE: if a bit is set to 1, than the corresponding alarm is active.

Bit #	error byte 1	POS	R / W	C1001/2	C4000	C5000
0	return air temp. too high alarm	0x01	R	X	X	X
1	return air humid. too high alarm	0x02	R	X	X	X
2	supply air temp. too high alarm	0x04	R		X	X
3	supply air humid. too high alarm	0x08	R		X	X
4	water temp. too high alarm	0x10	R		X	X
5	return air temp. too low alarm	0x20	R	X	X	X
6	return air humid. too low alarm	0x40	R	X	X	X
7	supply air temp. too low alarm	0x80	R		X	X

NOTE: if a bit is set to 1, than the corresponding alarm is active.

Bit #	error byte 2	POS	R / W	C1001/2	C4000	C5000
0	supply air humid. too low alarm	0x01	R		X	X
1	water temp. too low alarm	0x02	R		X	X
2	supervisor failure	0x04	R		X	X
3	freeze alarm	0x08	R		X	X
4	fire / smoke detector	0x10	R	X	X	X
5	sensor failure	0x20	R	X	X	X
6	internal controller error	0x40	R	X	X	X
7	IO-board transmission failure	0x80	R		X	X

NOTE: if a bit is set to 1, than the corresponding alarm is active.

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P.03

2 set vals

49	suction valve proportional band	0.0..10.0K	0..100	X	X	
50	drycooler start temperature	0.0..10.0K	0..100	X	X	
51	reheat 1 start temperature	0.0..10.0K	0..100	X	X	
52	reheat 1 hysteresis	0.0..10.0K	0..100	X	X	
53	reheat 2 start temperature	0.0..10.0K	0..100	X	X	
54	reheat 2 hysteresis	0.0..10.0K	0..100	X	X	
55	reheat 3 start temperature	0.0..10.0K	0..100	X	X	
56	reheat 3 hysteresis	0.0..10.0K	0..100	X	X	
57	dehumidification start	0..90%	0..90	X	X	
58	dehumidification hysteresis	0..90%	0..90	X	X	
59	humidification start	0..90%	0..90	X	X	
60	humidification hysteresis	0..90%	0..90	X	X	
----- data module 3 -----						
61	compressor start (setpoint + val)	0.0..10.0K	0..100	X	X	
62	compressor hysteresis	0.0..10.0K	0..100	X	X	
63	suction valve start	0.0..10.0K	0..100	X	X	
64	suction valve proportional band	0.0..10.0K	0..100	X	X	
65	drycooler start temperature	0.0..10.0K	0..100	X	X	
66	reheat 1 start temperature	0.0..10.0K	0..100	X	X	
67	reheat 1 hysteresis	0.0..10.0K	0..100	X	X	
68	reheat 2 start temperature	0.0..10.0K	0..100	X	X	
69	reheat 2 hysteresis	0.0..10.0K	0..100	X	X	
70	reheat 3 start temperature	0.0..10.0K	0..100	X	X	
71	reheat 3 hysteresis	0.0..10.0K	0..100	X	X	
72	dehumidification start	0..90%	0..90	X	X	
73	dehumidification hysteresis	0..90%	0..90	X	X	
74	humidification start	0..90%	0..90	X	X	
75	humidification hysteresis	0..90%	0..90	X	X	
----- data module 4 -----						
76	compressor start (setpoint + val)	0.0..10.0K	0..100	X	X	
77	compressor hysteresis	0.0..10.0K	0..100	X	X	
78	suction valve start	0.0..10.0K	0..100	X	X	
79	suction valve proportional band	0.0..10.0K	0..100	X	X	
80	drycooler start temperature	0.0..10.0K	0..100	X	X	
81	reheat 1 start temperature	0.0..10.0K	0..100	X	X	
82	reheat 1 hysteresis	0.0..10.0K	0..100	X	X	
83	reheat 2 start temperature	0.0..10.0K	0..100	X	X	
84	reheat 2 hysteresis	0.0..10.0K	0..100	X	X	
85	reheat 3 start temperature	0.0..10.0K	0..100	X	X	
86	reheat 3 hysteresis	0.0..10.0K	0..100	X	X	
87	dehumidification start	0..90%	0..90	X	X	
88	dehumidification hysteresis	0..90%	0..90	X	X	
89	humidification start	0..90%	0..90	X	X	
90	humidification hysteresis	0..90%	0..90	X	X	
----- general data -----						
91	general status byte 1	bit-coded	see table	X	X	X
92	general status byte 2	bit-coded	see table	X	X	X
93	LB checksum	1..255		X	X	X
94	HB checksum	1..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 92.

2 set vals

Set Parameter

Set Parameter (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		2	X	X	X
2	number of following bytes		92	X	X	X
3	not used					
4	not used					
5	not used					
6	not used					
7	not used					
8	not used					
9	not used					
10	setpoint temperature	10.0..30.0°C	0..200	X	X	X
11	setpoint humidity	10..90%	10..90	X	X	X
12	return air temperature too high	0..30 °C	0..30	X	X	X
13	supply air temperature too high	0..30 °C	0..90		X	X
14	return air temperature too low	0..30 °C	0..30	X	X	X
15	supply air temperature too low	0..30 °C	0..30		X	X
16	water temperature too high	0..50°C	0..50		X	X
17	water temperature too low	-50.0..30 °C	0..80		X	X
18	return humidity too high	0..90	0..90	X	X	X
19	supply humidity too high	0..90	0..90		X	X
20	return humidity too low	0..90	0..90	X	X	X
21	supply humidity too low	0..90	0..90		X	X
----- data module 1 -----						
22	compressor start (setpoint + val)	0.0..10.0K	0..100	X	X	X
23	compressor hysteresis	0.0..10.0K	0..100	X	X	X
24	suction valve start	0.0..10.0K	0..100		X	X
25	suction valve proportional band	0.0..10.0K	0..100		X	X
26	drycooler start temperature	0.0..10.0K	0..100		X	X
27	drycooler enable temperature	0..35°C	0..35		X	X
28	glycol-pump start temperature	0.0..10.0K	0..100		X	X
29	GE/CW valve off temperature	0..45°C	0..45		X	X
30	GE/CW valve start temperature	0.0..10.0K	0..100	X	X	X
31	GE/CW valve proportional band	0.0..10.0K	0..100	X	X	X
32	reheat 1 start temperature	0.0..10.0K	0..100	X	X	X
33	reheat 1 hysteresis	0.0..10.0K	0..100	X	X	X
34	reheat 2 start temperature	0.0..10.0K	0..100	X	X	X
35	reheat 2 hysteresis	0.0..10.0K	0..100		X	X
36	reheat 3 start temperature	0.0..10.0K	0..100		X	X
37	reheat 3 hysteresis	0.0..10.0K	0..100		X	X
38	PWW valve start temperature	0.0..10.0K	0..100		X	X
39	PWW valve proportional band	0.0..10.0K	0..100		X	X
40	dehumidification start	0..90%	0..90	X	X	X
41	dehumidification hysteresis	0..90%	0..90	X	X	X
42	humidification start	0..90%	0..90	X	X	X
43	humidification hysteresis	0..90%	0..90	X	X	X
44	humidification proportional start	0..90%	0..90		X	X
45	humidification proportional band	0..90%	0..90		X	X
----- data module 2 -----						
46	compressor start (setpoint + val)	0.0..10.0K	0..100	X	X	X
47	compressor hysteresis	0.0..10.0K	0..100		X	X
48	suction valve start	0.0..10.0K	0..100		X	X

2 set vals

Set Parameter Acknowledge (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		2	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	1..255		X	X	X
4	HB checksum	1..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

3 set time

Set Time

Set Time (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255			X	X
1	command id		3		X	X
2	number of following bytes		7		X	X
3	year	0..99			X	X
4	month	1..12			X	X
5	day	1..31			X	X
6	hour	0..23			X	X
7	minute	0..59			X	X
8	LB checksum	0..255			X	X
9	HB checksum	0..255			X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 7.

Set Time Acknowledge (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255			X	X
1	command id		3		X	X
2	number of following bytes		2		X	X
3	LB checksum	0..255			X	X
4	HB checksum	0..255			X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

4 EEP read

Read Controller EEPROM Data

Read EEPROM Data (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		4	X	X	X
2	number of following bytes		3	X	X	X
3	EEPROM address to be read	0..255	0..255	X	X	X
4	LB checksum	0..255		X	X	X
5	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 3.

Read EEPROM Data (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		4	X	X	X
2	number of following bytes		3	X	X	X
3	contents of EEPROM (value)	0..255	0..255	X	X	X
4	LB checksum	0..255		X	X	X
5	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 3.

EEPROM Address List:

Address	Description	Range	Value	C1001/2	C4000	C5000
56-57	LB/HB runtime fan 1	0..65536	0..65536		O.T.E.	?
58-59	LB/HB runtime compressor 1	0..65536	0..65536		O.T.E.	?
60-61	LB/HB runtime humidifier 1	0..65536	0..65536		O.T.E.	?
62-63	LB/HB runtime reheat 1 / pump 1	0..65536	0..65536		O.T.E.	?
64-65	LB/HB runtime reheat 2 / pump 2	0..65536	0..65536		O.T.E.	?
66-67	LB/HB runtime fan 2	0..65536	0..65536		O.T.E.	?
68-69	LB/HB runtime compressor 2	0..65536	0..65536		O.T.E.	?
76-77	LB/HB runtime fan 3	0..65536	0..65536		O.T.E.	?
78-79	LB/HB runtime compressor 3	0..65536	0..65536		O.T.E.	?
86-87	LB/HB runtime fan 4	0..65536	0..65536		O.T.E.	?
88-89	LB/HB runtime compressor 4	0..65536	0..65536		O.T.E.	?
115	setpoint temperature	10.0..35.0°C	0..250	X	X	X
116	setpoint humidity	0..100%	0..100	X	X	X
122	return air temp. too high alarm	0..50°C	0..50	X	X	X
124	return air temp. too low alarm	0..50°C	0..50	X	X	X
128	return air humid. too high alarm	0..90%	0..90	X	X	X
130	return air humid. too low alarm	0..90%	0..90	X	X	X

5 EEP write

Write Controller EEPROM Data**Write EEPROM Data (PC -> MC)**

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1,255		X	X	X
1	command id		5	X	X	X
2	number of following bytes		4	X	X	X
3	EEPROM address	0,255	0,255	X	X	X
4	EEPROM data	0,255	0,255	X	X	X
5	LB checksum	0,255		X	X	X
6	HB checksum	0,255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 4.

Write EEPROM Data (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1,255		X	X	X
1	command id		5	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	0,255		X	X	X
4	HB checksum	0,255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

EEPROM Address List: see list for command 4 (READ EEPROM)

6 RAM write

Write RAM Data for Temporary Changes

Write RAM Data for temporary changes (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		6	X	X	X
2	number of following bytes		4	X	X	X
3	RAM address	0..255	0..255	X	X	X
4	RAM data	0..255	0..255	X	X	X
5	LB checksum	0..255		X	X	X
6	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 4.

Write RAM Data for temporary changes (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		6	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	0..255		X	X	X
4	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

RAM / EEPROM Address List: see list for command 4 (READ EEPROM)

7 ON-OFF

Set Unit ON / OFF - Request Short Status

Set Unit ON / OFF / REQUEST STATUS (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		7	X	X	X
2	number of following bytes		3	X	X	X
3	STATUS-REQUEST / ON / OFF byte	bit-coded		X	X	X
4	LB checksum	0..255		X	X	X
5	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 3.

Set Unit ON / OFF / REQUEST STATUS (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		7	X	X	X
2	number of following bytes		3	X	X	X
3	S_STAT short unit status	bit-coded		X	X	X
4	LB checksum	0..255		X	X	X
5	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 3.

Bit #	STATUS-REQUEST / ON / OFF byte	POS	Value	C1001/2	C4000	C5000
0	0 = unit off, 1 = unit on	0x01	bit	X	X	X
1	1 = request short status only	0x02	bit	X	X	X
2	not used	0x04	bit	X	X	X
3	not used	0x08	bit	X	X	X
4	not used	0x10	bit	X	X	X
5	not used	0x20	bit	X	X	X
6	not used	0x40	bit	X	X	X
7	not used	0x80	bit	X	X	X

NOTE: if bit #1 is set to 1, the value of bit #0 is don't care !!

Bit #	S_STAT short unit status	POS	R/W	C1001/2	C4000	C5000
0	0 = PC-STOP (monitoring), 1 = on	0x01	R/W	X	X	X
1	0 = REMOTE STOP (contact), 1 = on	0x02	R	X	X	X
2	0 = LOCAL STOP (key), 1 = on	0x04	R	X	X	X
3	0 = TIMER-STOP (weekly oper.), 1 = on	0x08	R			X
4	1 = WARNING (FILTER...)	0x10	R	X	X	X
5	1 = HUMIDITY ALARM (low / high)	0x20	R	X	X	X
6	1 = TEMPERATURE ALARM (low / high)	0x40	R	X	X	X
7	1 = COMMON ALARM	0x80	R	X	X	X

NOTE: only if bits #0 to #3 are set to 1 the unit is in operation.
 If one of the bits #0,#1,#2,#3 is set to 0 the unit is in STOP condition.

8 AL-reset

Unit Alarm Reset

Unit Alarm Reset (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		8	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	0..255		X	X	X
4	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

Unit Alarm Reset (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		8	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	0..255		X	X	X
4	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

9 status 2

Controller Status 2, Component Runtime

Controller Status 2, Component Runtime (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255			X	X
1	command id		9		X	X
2	number of following bytes		2		X	X
3	LB checksum	0..255			X	X
4	HB checksum	0..255			X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

Controller Status 2, Component Runtime (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255			X	X
1	command id		9		X	X
2	number of following bytes		43		X	X
3	number of modules	0..8	0..8		X	X
----- data module 1 -----						
4	LB runtime fan 1	0..65536			X	X
5	HB runtime fan 1				X	X
6	LB runtime compressor 1	0..65536			X	X
7	HB runtime compressor 1				X	X
8	LB runtime humidifier 1	0..65536			X	X
9	HB runtime humidifier 1				X	X
10	LB runtime pump 1 (reheat 1)	0..65536			X	X
11	HB runtime pump 1 (reheat 1)				X	X
12	LB runtime pump 2 (reheat 2)	0..65536			X	X
13	HB runtime pump 2 (reheat 2)				X	X
----- data module 2 -----						
14	LB runtime fan 1	0..65536			X	X
15	HB runtime fan 1				X	X
16	LB runtime compressor 1	0..65536			X	X
17	HB runtime compressor 1				X	X
18	LB runtime humidifier 1	0..65536			X	X
19	HB runtime humidifier 1				X	X
20	LB runtime pump 1 (reheat 1)	0..65536			X	X
21	HB runtime pump 1 (reheat 1)				X	X
22	LB runtime pump 2 (reheat 2)	0..65536			X	X
23	HB runtime pump 2 (reheat 2)				X	X
----- data module 3 -----						
24	LB runtime fan 1	0..65536			X	X
25	HB runtime fan 1				X	X
26	LB runtime compressor 1	0..65536			X	X
27	HB runtime compressor 1				X	X
28	LB runtime humidifier 1	0..65536			X	X
29	HB runtime humidifier 1				X	X
30	LB runtime pump 1 (reheat 1)	0..65536			X	X
31	HB runtime pump 1 (reheat 1)				X	X
32	LB runtime pump 2 (reheat 2)	0..65536			X	X
33	HB runtime pump 2 (reheat 2)				X	X

9 status 2

data module 4

34	LB runtime fan 1	0.65536	X	X
35	HB runtime fan 1			
36	LB runtime compressor 1	0.65536	X	X
37	HB runtime compressor 1			
38	LB runtime humidifier 1	0.65536	X	X
39	HB runtime humidifier 1			
40	LB runtime pump 1 (reheat 1)	0.65536	X	X
41	HB runtime pump 1 (reheat 1)			
42	LB runtime pump 2 (reheat 2)	0.65536	X	X
43	HB runtime pump 2 (reheat 2)			
44	LB checksum	0.255	X	X
45	HB checksum	0.255	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 43.

10 ident

Controller Identification

Controller Identification (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		10	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	0..255		X	X	X
4	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

Controller Identification (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		10	X	X	X
2	number of following bytes		6	X	X	X
3	software version	0..255	0..255	X	X	X
4	hardware version	0..255	see table	X	X	X
5	reserved			X	X	X
6	unit type	0..255	see table	X	X	X
7	LB checksum	0..255		X	X	X
8	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 6.

Value	Hardware Version
0	unknown type
1	STULZ C4000
2	STULZ C1001
3	STULZ C1002
4	STULZ C5000
5	not used
6	...

Value	Unit Type
0	MC-only
1	DX (Compressor Unit)
2	CW (Chilled Water Unit)
3	CH (Chiller)
4	not used
5	...

11 config

Unit Configuration

Unit Configuration (PC -> MC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		11	X	X	X
2	number of following bytes		2	X	X	X
3	LB checksum	0..255		X	X	X
4	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 2.

Unit Configuration (MC -> PC)

Byte #	Description	Range	Value	C1001/2	C4000	C5000
0	controller id	1..255		X	X	X
1	command id		11	X	X	X
2	number of following bytes		13	X	X	X
3	number of modules	0..8	0..8	X	X	X
4	LB configuration module 1	bit-coded	see table	X	X	X
5	HB configuration module 1	bit-coded	see table	X	X	X
6	LB configuration module 2	bit-coded	see table	X	X	X
7	HB configuration module 2	bit-coded	see table	X	X	X
8	LB configuration module 3	bit-coded	see table	X	X	X
9	HB configuration module 3	bit-coded	see table	X	X	X
10	LB configuration module 4	bit-coded	see table	X	X	X
11	HB configuration module 4	bit-coded	see table	X	X	X
12	general configuration byte 1	bit-coded	see table	X	X	X
13	general configuration byte 2 (not used)	bit-coded	see table	X	X	X
14	LB checksum	0..255		X	X	X
15	HB checksum	0..255		X	X	X

The 16 bit checksum is the 2's complement of the sum from byte 0 to byte 13.

Bit #	LB configuration module x	POS	Value	C1001/2	C4000	C5000
0	reheat 1	0x01	bit	X	X	X
1	reheat 2	0x02	bit	X	X	X
2	reheat 3 / hotgas reheat	0x04	bit		X	X
3	glycol pump	0x08	bit		X	X
4	drycooler	0x10	bit		X	X
5	compressor (1st stage)	0x20	bit	X	X	X
6	dehumidification	0x40	bit	X	X	X
7	humidification	0x80	bit	X	X	X

NOTE: bit set means component configured.

Bit #	HB configuration module x	POS	Value	C1001/2	C4000	C5000
0	GE/CW valve	0x01	bit	X	X	X
1	stand-by module	0x02	bit		X	X
2	compressor 2nd stage	0x04	bit			X
3	not used	0x08	bit			
4	not used	0x10	bit			
5	not used	0x20	bit			
6	not used	0x40	bit			
7	not used	0x80	bit			

NOTE: bit set means component configured.

11 config

Bit #	General Configuration Byte 1	POS	Value	C1001/2	C4000	C5000
0	0=controller, 1=supervisor	0x01	bit		X	X
1	1=outside air sensor	0x02	bit		X	X
2	control type: 0=return air, 1=supply air	0x04	bit		X	X
3	temperature limited	0x08	bit		X	
4	not used	0x10	bit			
5	not used	0x20	bit			
6	not used	0x40	bit			
7	not used	0x80	bit			