

CoolGate Reference Manual



CoolGate
CoolGate PRO

Interface Adapter
MODBUS to VRV,VRF
Air Conditioning
Systems

PRELIMINARY DATA

Revision 0.4 10/6/2009

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1 Release Notes

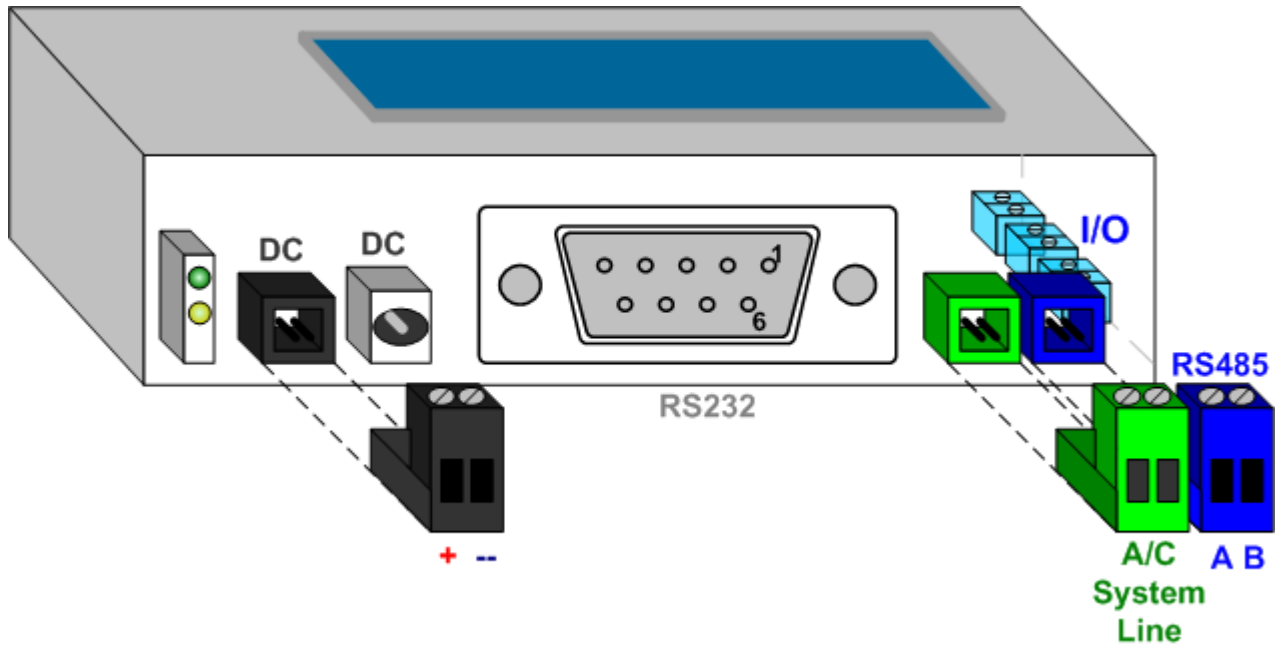
Document revision 0.4 Tuesday, October 06, 2009

Type	Compatible FW version	
	CoolGate	CoolGate PRO
1000D	2.3.8	2.3.8
2000S	2.3.8	n.a.
3000T	2.3.8	n.a.
4000M	2.3.9	n.a.

Document revision history

- 0.4
- Added failure code translation for CoolGate S and T types

2 CoolGate Layout





3 General Address Allocation

Coil, Register, Input Address Range (hex)	Zone Size	Access	Translation
0001 - 0800	128x16=0x800	Indoor System Parameters via AirNet 000-127	AirNet = (Address-1 >> 4)
0801 - 0900	16x16=0x100	Outdoor System Parameters 0-15	Outdoor System = (Address-1-0x800)>>4
0901 - 0B00	32x16=0x200	Outdoor Unit 0-15	Outdoor Unit = (Address-1-0x900)>>5
0B01 - 1000	0x500	Reserved	
1001 - F640	0xE640	Indoor Units 1-00 - 15-99	Indoor System = (Address-1-0x1000) >> 12 + 1 Indoor Unit = ((Address-1-0x1000) >> 4) & 0xFF
F641 - F700	0xC0	Reserved	
F701 - F800	0x100	Indoor Group Operations	
F801 - FFFF	0x800	Reserved	

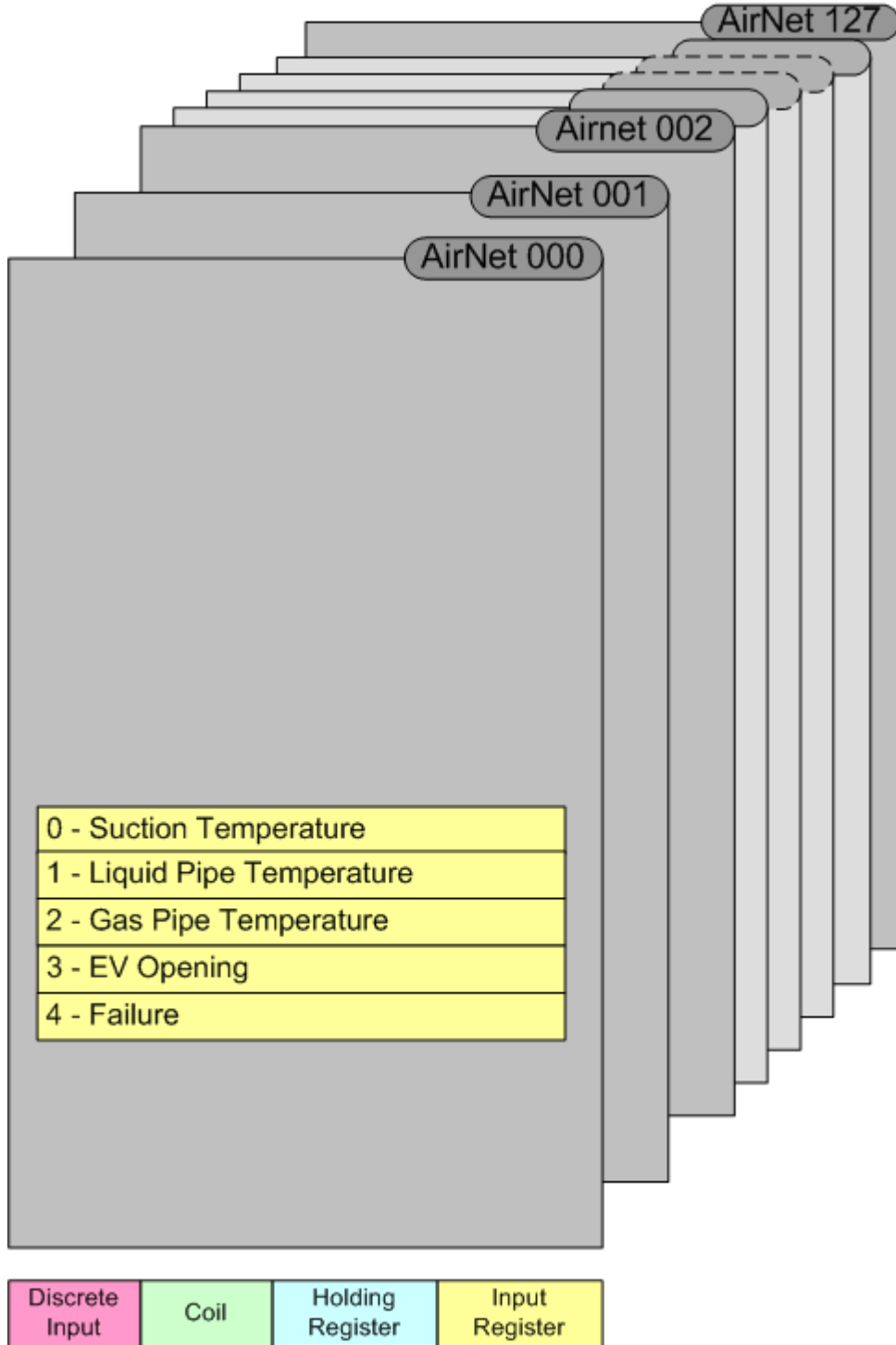
Backward conversion

Indoor System Parameters via AirNet 000-127	Address = AirNet << 4 + 1
Outdoor System 0-15	Address = (OutdoorSystem << 4)+0x800 + 1



4 Indoor System Parameters Map

Access to Indoor system parameters available in CoolGate PRO only.



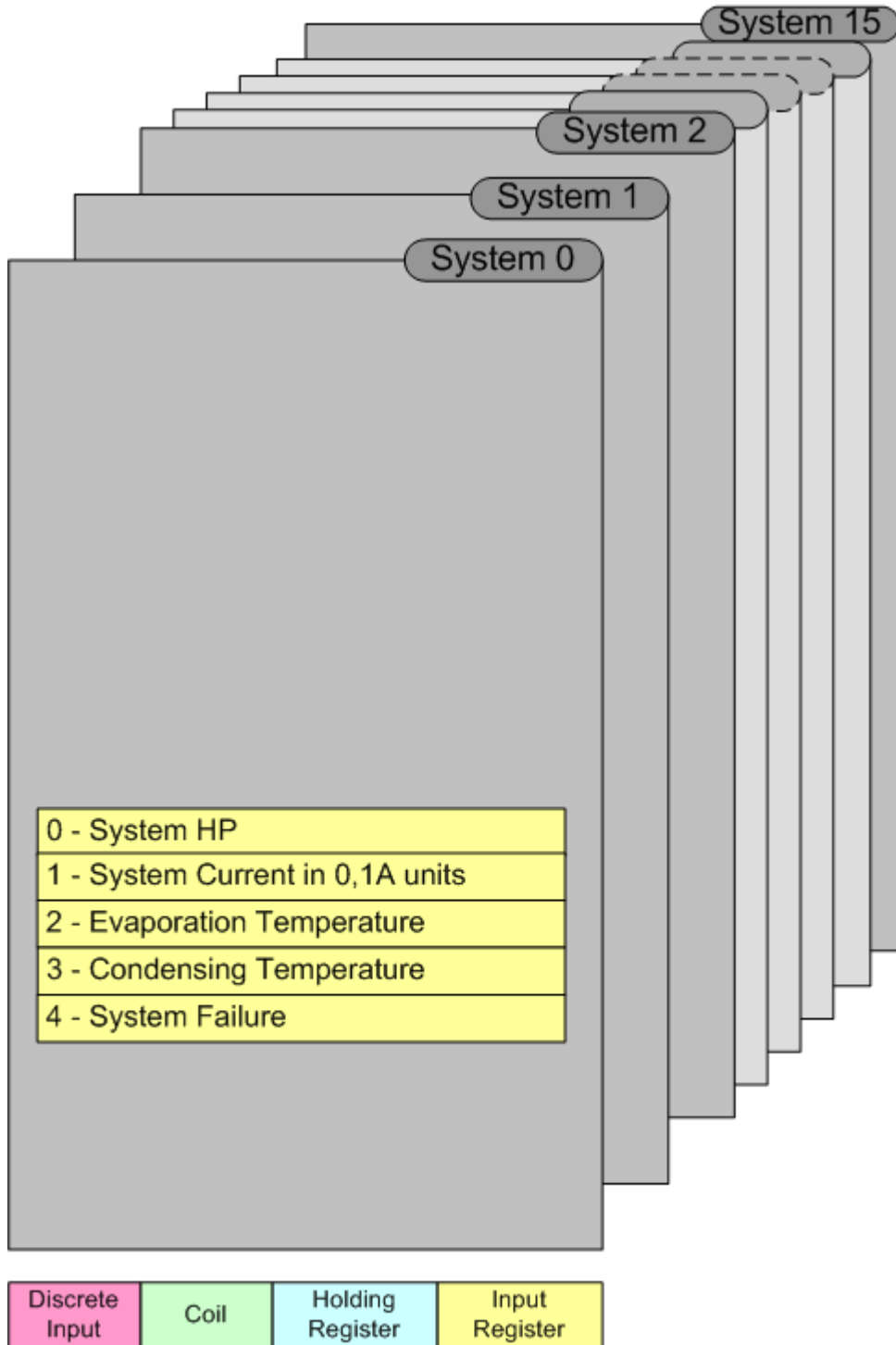


AirNet Address	Base Address (hex)	Discrete Inputs (hex)	Coils (hex)	Holding Registers (hex)	Input Registers (hex)	
000	0001				0001	Suction Temperature
					0002	Liquid Pipe Temperature
					0003	Gas Pipe Temperature
					0004	EV Opening
					0005	Failure Code
...						
127	07F1				07F1	Suction Temperature
					07F2	Liquid Pipe Temperature
					07F3	Gas Pipe Temperature
					07F4	EV Opening
					07F5	Failure Code



5 Outdoor Systems

Access to Outdoor system parameters available in CoolGate PRO only.

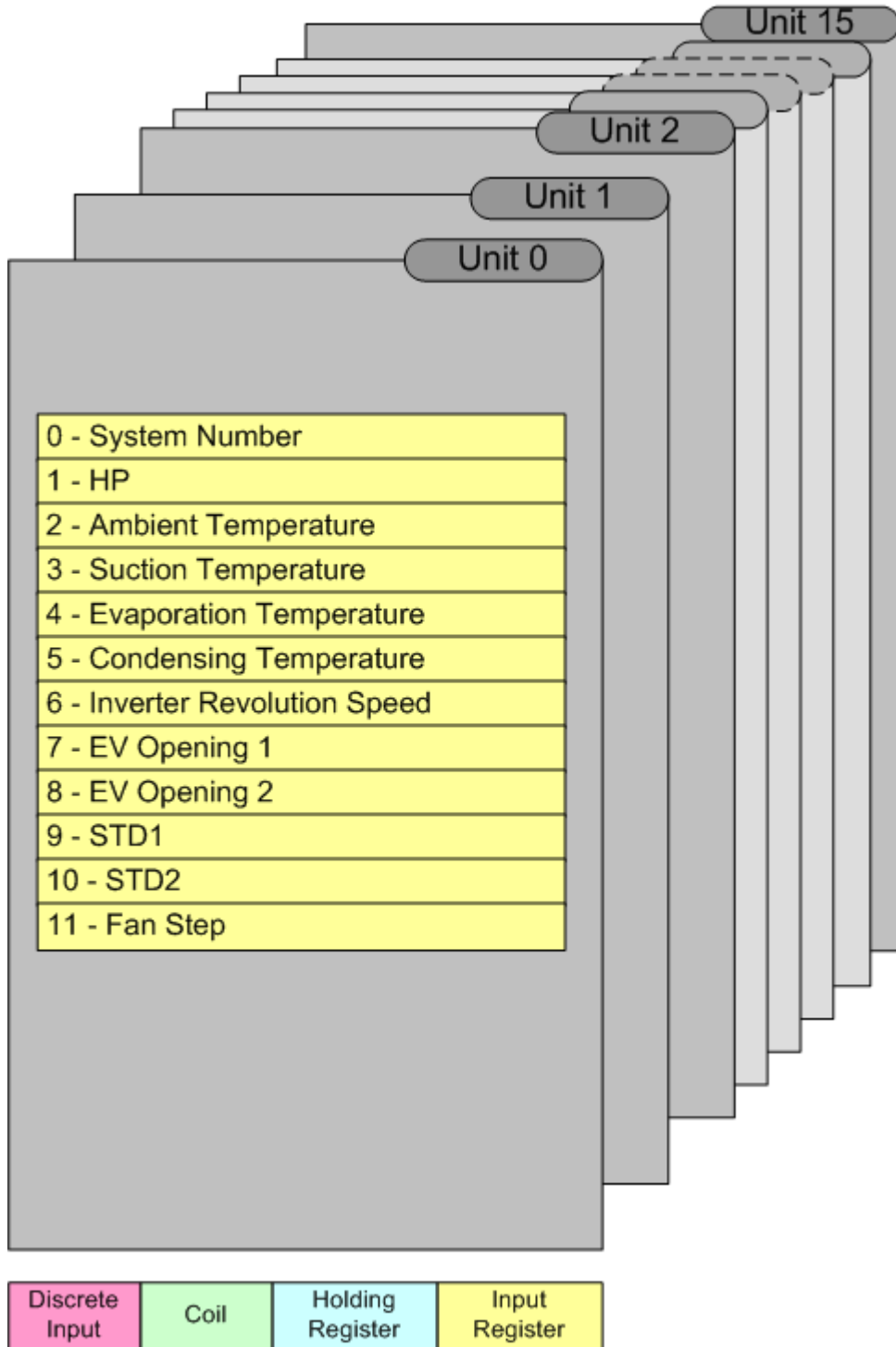




Outdoor System	Base Address (hex)	Discrete Inputs (hex)	Coils (hex)	Holding Registers (hex)	Input Registers (hex)	
0	0801				0801	System HP
					0802	System Current in 0.1A units
					0803	Evaporation Temperature
					0804	Condensing Temperature
					0805	System Failure
...						
15	08F1				08F1	System HP
					08F2	System Current in 0.1A units
					08F3	Evaporation Temperature
					08F4	Condensing Temperature
					08F5	System Failure

6 Outdoor Units

Access to Outdoor system parameters available in CoolGate PRO only.





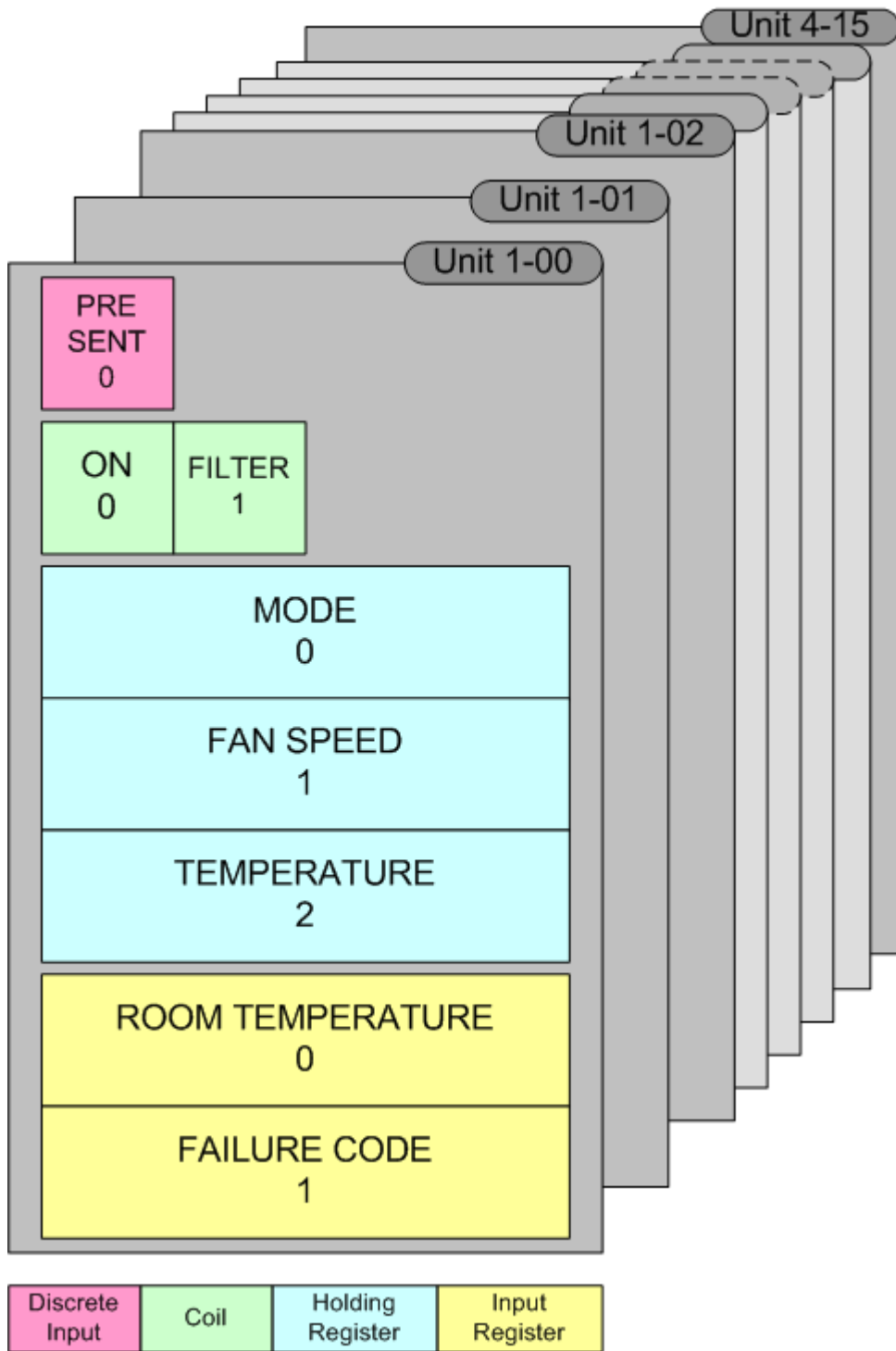
Outdoor Unit	Base Address (hex)	Discrete Inputs (hex)	Coils (hex)	Holding Registers (hex)	Input Registers (hex)	
0	0901				0901	System Number
					0902	HP
					0903	Ambient Temperature
					0904	Suction Temperature
					0905	Evaporation Temperature
					0906	Condensing Temperature
					0907	Inverter Revolution Speed
					0908	EV Opening 1
					0909	EV Opening 2
					090A	STD1
					090B	STD2
					090C	Fan Step

...

Outdoor Unit	Base Address (hex)	Discrete Inputs (hex)	Coils (hex)	Holding Registers (hex)	Input Registers (hex)	
15	0AE1				0AE1	System Number
					0AE2	HP
					0AE3	Ambient Temperature
					0AE4	Suction Temperature
					0AE5	Evaporation Temperature
					0AE6	Condensing Temperature
					0AE7	Inverter Revolution Speed
					0AE8	EV Opening 1
					0AE9	EV Opening 2
					0AEA	STD1
					0AEB	STD2
					0AEC	Fan Step



7 Indoors Address Map





Indoor Unit	Base Address (hex)	Discrete Inputs (hex)		Coils (hex)		Holding Registers (hex)		Input Registers (hex)	
		Address	Status	Address	Function	Address	Function	Address	Function
1-00	1001	1001	Present	1001	On/Off	1001	Mode	1001	Room Temperature
				1002	Filter Sign	1002	Fan Speed	1002	Failure Code
						1003	Temperature		
1-01	1011	1011	Present	1011	On/Off	1011	Mode	1011	Room Temperature
				1012	Filter Sign	1012	Fan Speed	1012	Failure Code
						1013	Temperature		
1-02	1021	1021	Present	1021	On/Off	1021	Mode	1021	Room Temperature
				1022	Filter Sign	1022	Fan Speed	1022	Failure Code
						1023	Temperature		
...									
2-00	2001	2001	Present	2001	On/Off	2001	Mode	2001	Room Temperature
				2002	Filter Sign	2002	Fan Speed	2002	Failure Code
						2003	Temperature		
...									
3-00	3001	3001	Present	3001	On/Off	3001	Mode	3001	Room Temperature
				3002	Filter Sign	3002	Fan Speed	3002	Failure Code
						3003	Temperature		
...									
4-00	4001	4001	Present	4001	On/Off	4001	Mode	4001	Room Temperature
				4002	Filter Sign	4002	Fan Speed	4002	Failure Code
						4003	Temperature		
...									
4-15	40F1	40F1	Present	40F1	On/Off	40F1	Mode	40F1	Room Temperature
				40F2	Filter Sign	40F2	Fan Speed	40F2	Failure Code
						40F3	Temperature		

Indoor Unit - Indoor Unit number same as in **stat** command.

CoolGate Type	Indoor Unit number	Modbus Map Base Address
1000D	1-00 .. 1-15	0x1001 .. 0x10F1
	2-00 .. 2-15	0x2001 .. 0x20F1
	3-00 .. 3-15	0x3001 .. 0x30F1
	4-00 .. 4-15	0x4001 .. 0x40F1
2000S 3000T	1-01 .. 1-99	0x1011 .. 0x1631
	2-01 .. 2-99	0x2011 .. 0x2631

	F-01 .. F-99	0xF011 .. 0xF631
4000M	001 .. 050	0x1011 .. 0x1321

Mode Encoding

Cool	0
Heat	1
Auto	2
Dry	3
Haux	4
Fan	5

Fan Speed Encoding

Low	0
Medium	1
High	2



Auto	3
Top	4



8 Indoor Group Operations

Discrete Inputs (hex)		Coils (hex)		Holding Registers (hex)		Input Registers (hex)	
		F701	All On/Off (Write Only)				



9 Failure Codes

Below is a translation table between failure code register value and failure code used by A/C manufacturer. For M model register value and failure code are the same and requires no translation.

• For CoolGate D type

000 (0x00) - 00	001 (0x01) - 01	002 (0x02) - 02	003 (0x03) - 03
004 (0x04) - 04	005 (0x05) - 05	006 (0x06) - 06	007 (0x07) - 07
008 (0x08) - 08	009 (0x09) - 09	010 (0x0A) - 0A	011 (0x0B) - 0H
012 (0x0C) - 0C	013 (0x0D) - 0J	014 (0x0E) - 0E	015 (0x0F) - 0F
016 (0x10) - A0	017 (0x11) - A1	018 (0x12) - A2	019 (0x13) - A3
020 (0x14) - A4	021 (0x15) - A5	022 (0x16) - A6	023 (0x17) - A7
024 (0x18) - A8	025 (0x19) - A9	026 (0x1A) - AA	027 (0x1B) - AH
028 (0x1C) - AC	029 (0x1D) - AJ	030 (0x1E) - AE	031 (0x1F) - AF
032 (0x20) - C0	033 (0x21) - C1	034 (0x22) - C2	035 (0x23) - C3
036 (0x24) - C4	037 (0x25) - C5	038 (0x26) - C6	039 (0x27) - C7
040 (0x28) - C8	041 (0x29) - C9	042 (0x2A) - CA	043 (0x2B) - CH
044 (0x2C) - CC	045 (0x2D) - CJ	046 (0x2E) - CE	047 (0x2F) - CF
048 (0x30) - E0	049 (0x31) - E1	050 (0x32) - E2	051 (0x33) - E3
052 (0x34) - E4	053 (0x35) - E5	054 (0x36) - E6	055 (0x37) - E7
056 (0x38) - E8	057 (0x39) - E9	058 (0x3A) - EA	059 (0x3B) - EH
060 (0x3C) - EC	061 (0x3D) - EJ	062 (0x3E) - EE	063 (0x3F) - EF
064 (0x40) - H0	065 (0x41) - H1	066 (0x42) - H2	067 (0x43) - H3
068 (0x44) - H4	069 (0x45) - H5	070 (0x46) - H6	071 (0x47) - H7
072 (0x48) - H8	073 (0x49) - H9	074 (0x4A) - HA	075 (0x4B) - HH
076 (0x4C) - HC	077 (0x4D) - HJ	078 (0x4E) - HE	079 (0x4F) - HF
080 (0x50) - F0	081 (0x51) - F1	082 (0x52) - F2	083 (0x53) - F3
084 (0x54) - F4	085 (0x55) - F5	086 (0x56) - F6	087 (0x57) - F7
088 (0x58) - F8	089 (0x59) - F9	090 (0x5A) - FA	091 (0x5B) - FH
092 (0x5C) - FC	093 (0x5D) - FJ	094 (0x5E) - FE	095 (0x5F) - FF
096 (0x60) - J0	097 (0x61) - J1	098 (0x62) - J2	099 (0x63) - J3
100 (0x64) - J4	101 (0x65) - J5	102 (0x66) - J6	103 (0x67) - J7
104 (0x68) - J8	105 (0x69) - J9	106 (0x6A) - JA	107 (0x6B) - JH
108 (0x6C) - JC	109 (0x6D) - JJ	110 (0x6E) - JE	111 (0x6F) - JF
112 (0x70) - L0	113 (0x71) - L1	114 (0x72) - L2	115 (0x73) - L3
116 (0x74) - L4	117 (0x75) - L5	118 (0x76) - L6	119 (0x77) - L7
120 (0x78) - L8	121 (0x79) - L9	122 (0x7A) - LA	123 (0x7B) - LH
124 (0x7C) - LC	125 (0x7D) - LJ	126 (0x7E) - LE	127 (0x7F) - LF
128 (0x80) - P0	129 (0x81) - P1	130 (0x82) - P2	131 (0x83) - P3
132 (0x84) - P4	133 (0x85) - P5	134 (0x86) - P6	135 (0x87) - P7
136 (0x88) - P8	137 (0x89) - P9	138 (0x8A) - PA	139 (0x8B) - PH
140 (0x8C) - PC	141 (0x8D) - PJ	142 (0x8E) - PE	143 (0x8F) - PF
144 (0x90) - U0	145 (0x91) - U1	146 (0x92) - U2	147 (0x93) - U3
148 (0x94) - U4	149 (0x95) - U5	150 (0x96) - U6	151 (0x97) - U7
152 (0x98) - U8	153 (0x99) - U9	154 (0x9A) - UA	155 (0x9B) - UH
156 (0x9C) - UC	157 (0x9D) - UJ	158 (0x9E) - UE	159 (0x9F) - UF
160 (0xA0) - M0	161 (0xA1) - M1	162 (0xA2) - M2	163 (0xA3) - M3
164 (0xA4) - M4	165 (0xA5) - M5	166 (0xA6) - M6	167 (0xA7) - M7
168 (0xA8) - M8	169 (0xA9) - M9	170 (0xAA) - MA	171 (0xAB) - MH
172 (0xAC) - MC	173 (0xAD) - MJ	174 (0xAE) - ME	175 (0xAF) - MF
176 (0xB0) - 30	177 (0xB1) - 31	178 (0xB2) - 32	179 (0xB3) - 33
180 (0xB4) - 34	181 (0xB5) - 35	182 (0xB6) - 36	183 (0xB7) - 37
184 (0xB8) - 38	185 (0xB9) - 39	186 (0xBA) - 3A	187 (0xBB) - 3H
188 (0xBC) - 3C	189 (0xBD) - 3J	190 (0xBE) - 3E	191 (0xBF) - 3F
192 (0xC0) - 40	193 (0xC1) - 41	194 (0xC2) - 42	195 (0xC3) - 43
196 (0xC4) - 44	197 (0xC5) - 45	198 (0xC6) - 46	199 (0xC7) - 47
200 (0xC8) - 48	201 (0xC9) - 49	202 (0xCA) - 4A	203 (0xCB) - 4H
204 (0xCC) - 4C	205 (0xCD) - 4J	206 (0xCE) - 4E	207 (0xCF) - 4F
208 (0xD0) - 50	209 (0xD1) - 51	210 (0xD2) - 52	211 (0xD3) - 53
212 (0xD4) - 54	213 (0xD5) - 55	214 (0xD6) - 56	215 (0xD7) - 57
216 (0xD8) - 58	217 (0xD9) - 59	218 (0xDA) - 5A	219 (0xDB) - 5H
220 (0xDC) - 5C	221 (0xDD) - 5J	222 (0xDE) - 5E	223 (0xDF) - 5F
224 (0xE0) - 60	225 (0xE1) - 61	226 (0xE2) - 62	227 (0xE3) - 63
228 (0xE4) - 64	229 (0xE5) - 65	230 (0xE6) - 66	231 (0xE7) - 67
232 (0xE8) - 68	233 (0xE9) - 69	234 (0xEA) - 6A	235 (0xEB) - 6H
236 (0xEC) - 6C	237 (0xED) - 6J	238 (0xEE) - 6E	239 (0xEF) - 6F
240 (0xF0) - ?0	241 (0xF1) - ?1	242 (0xF2) - ?2	243 (0xF3) - ?3
244 (0xF4) - ?4	245 (0xF5) - ?5	246 (0xF6) - ?6	247 (0xF7) - ?7
248 (0xF8) - ?8	249 (0xF9) - ?9	250 (0xFA) - ?A	251 (0xFB) - ?H
252 (0xFC) - ?C	253 (0xFD) - ?J	254 (0xFE) - ?E	255 (0xFF) - ?F



• For CoolGate S or T type

000 (0x00) - 00	001 (0x01) - 01	002 (0x02) - 02	003 (0x03) - 03
004 (0x04) - 04	005 (0x05) - 05	006 (0x06) - 06	007 (0x07) - 07
008 (0x08) - 08	009 (0x09) - 09	010 (0x0A) - 0A	011 (0x0B) - 0B
012 (0x0C) - 0C	013 (0x0D) - 0D	014 (0x0E) - 0E	015 (0x0F) - 0F
016 (0x10) - 10	017 (0x11) - 11	018 (0x12) - 12	019 (0x13) - 13
020 (0x14) - 14	021 (0x15) - 15	022 (0x16) - 16	023 (0x17) - 17
024 (0x18) - 18	025 (0x19) - 19	026 (0x1A) - 1A	027 (0x1B) - 1B
028 (0x1C) - 1C	029 (0x1D) - 1D	030 (0x1E) - 1E	031 (0x1F) - 1F
032 (0x20) - 20	033 (0x21) - 21	034 (0x22) - 22	035 (0x23) - 23
036 (0x24) - 24	037 (0x25) - 25	038 (0x26) - 26	039 (0x27) - 27
040 (0x28) - 28	041 (0x29) - 29	042 (0x2A) - 2A	043 (0x2B) - 2B
044 (0x2C) - 2C	045 (0x2D) - 2D	046 (0x2E) - 2E	047 (0x2F) - 2F
048 (0x30) - 30	049 (0x31) - 31	050 (0x32) - 32	051 (0x33) - 33
052 (0x34) - 34	053 (0x35) - 35	054 (0x36) - 36	055 (0x37) - 37
056 (0x38) - 38	057 (0x39) - 39	058 (0x3A) - 3A	059 (0x3B) - 3B
060 (0x3C) - 3C	061 (0x3D) - 3D	062 (0x3E) - 3E	063 (0x3F) - 3F
064 (0x40) - E0	065 (0x41) - E1	066 (0x42) - E2	067 (0x43) - E3
068 (0x44) - E4	069 (0x45) - E5	070 (0x46) - E6	071 (0x47) - E7
072 (0x48) - E8	073 (0x49) - E9	074 (0x4A) - EA	075 (0x4B) - EB
076 (0x4C) - EC	077 (0x4D) - ED	078 (0x4E) - EE	079 (0x4F) - EF
080 (0x50) - L0	081 (0x51) - L1	082 (0x52) - L2	083 (0x53) - L3
084 (0x54) - L4	085 (0x55) - L5	086 (0x56) - L6	087 (0x57) - L7
088 (0x58) - L8	089 (0x59) - L9	090 (0x5A) - LA	091 (0x5B) - LB
092 (0x5C) - LC	093 (0x5D) - LD	094 (0x5E) - LE	095 (0x5F) - LF
096 (0x60) - F0	097 (0x61) - F1	098 (0x62) - F2	099 (0x63) - F3
100 (0x64) - F4	101 (0x65) - F5	102 (0x66) - F6	103 (0x67) - F7
104 (0x68) - F8	105 (0x69) - F9	106 (0x6A) - FA	107 (0x6B) - FB
108 (0x6C) - FC	109 (0x6D) - FD	110 (0x6E) - FE	111 (0x6F) - FF
112 (0x70) - 70	113 (0x71) - 71	114 (0x72) - 72	115 (0x73) - 73
116 (0x74) - 74	117 (0x75) - 75	118 (0x76) - 76	119 (0x77) - 77
120 (0x78) - 78	121 (0x79) - 79	122 (0x7A) - 7A	123 (0x7B) - 7B
124 (0x7C) - 7C	125 (0x7D) - 7D	126 (0x7E) - 7E	127 (0x7F) - 7F
128 (0x80) - 80	129 (0x81) - 81	130 (0x82) - 82	131 (0x83) - 83
132 (0x84) - 84	133 (0x85) - 85	134 (0x86) - 86	135 (0x87) - 87
136 (0x88) - 88	137 (0x89) - 89	138 (0x8A) - 8A	139 (0x8B) - 8B
140 (0x8C) - 8C	141 (0x8D) - 8D	142 (0x8E) - 8E	143 (0x8F) - 8F
144 (0x90) - 90	145 (0x91) - 91	146 (0x92) - 92	147 (0x93) - 93
148 (0x94) - 94	149 (0x95) - 95	150 (0x96) - 96	151 (0x97) - 97
152 (0x98) - 98	153 (0x99) - 99	154 (0x9A) - 9A	155 (0x9B) - 9B
156 (0x9C) - 9C	157 (0x9D) - 9D	158 (0x9E) - 9E	159 (0x9F) - 9F
160 (0xA0) - A0	161 (0xA1) - A1	162 (0xA2) - A2	163 (0xA3) - A3
164 (0xA4) - A4	165 (0xA5) - A5	166 (0xA6) - A6	167 (0xA7) - A7
168 (0xA8) - A8	169 (0xA9) - A9	170 (0xAA) - AA	171 (0xAB) - AB
172 (0xAC) - AC	173 (0xAD) - AD	174 (0xAE) - AE	175 (0xAF) - AF
176 (0xB0) - B0	177 (0xB1) - B1	178 (0xB2) - B2	179 (0xB3) - B3
180 (0xB4) - B4	181 (0xB5) - B5	182 (0xB6) - B6	183 (0xB7) - B7
184 (0xB8) - B8	185 (0xB9) - B9	186 (0xBA) - BA	187 (0xBB) - BB
188 (0xBC) - BC	189 (0xBD) - BD	190 (0xBE) - BE	191 (0xBF) - BF
192 (0xC0) - C0	193 (0xC1) - C1	194 (0xC2) - C2	195 (0xC3) - C3
196 (0xC4) - C4	197 (0xC5) - C5	198 (0xC6) - C6	199 (0xC7) - C7
200 (0xC8) - C8	201 (0xC9) - C9	202 (0xCA) - CA	203 (0xCB) - CB
204 (0xCC) - CC	205 (0xCD) - CD	206 (0xCE) - CE	207 (0xCF) - CF
208 (0xD0) - D0	209 (0xD1) - D1	210 (0xD2) - D2	211 (0xD3) - D3
212 (0xD4) - D4	213 (0xD5) - D5	214 (0xD6) - D6	215 (0xD7) - D7
216 (0xD8) - D8	217 (0xD9) - D9	218 (0xDA) - DA	219 (0xDB) - DB
220 (0xDC) - DC	221 (0xDD) - DD	222 (0xDE) - DE	223 (0xDF) - DF
224 (0xE0) - P0	225 (0xE1) - P1	226 (0xE2) - P2	227 (0xE3) - P3
228 (0xE4) - P4	229 (0xE5) - P5	230 (0xE6) - P6	231 (0xE7) - P7
232 (0xE8) - P8	233 (0xE9) - P9	234 (0xEA) - PA	235 (0xEB) - PB
236 (0xEC) - PC	237 (0xED) - PD	238 (0xEE) - PE	239 (0xEF) - PF
240 (0xF0) - H0	241 (0xF1) - H1	242 (0xF2) - H2	243 (0xF3) - H3
244 (0xF4) - H4	245 (0xF5) - H5	246 (0xF6) - H6	247 (0xF7) - H7
248 (0xF8) - H8	249 (0xF9) - H9	250 (0xFA) - HA	251 (0xFB) - HB
252 (0xFC) - HC	253 (0xFD) - HD	254 (0xFE) - HE	255 (0xFF) - HF