

CPE 103 - PROFIBUSPROTOCOL for FC400 Description

FC400 from release SW 1.9.0

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1 PREFACE

CPE 103 is the PROFIBUS converter for FC400 controller produced by Hyterm.

2 HYSTORY OF DOCUMENT

DATE	REV.	CHANGES
28/10/25	00	Release

3 CONTACT ADDRESS OF THE MANUFACTURER AND TECHNICAL SUPPORT

In case of information requests or technical issues the buyer can contact HYTERM at the following address:

HYTERM S.r.l.

Viale del lavoro, 18 – 25045 Castegnato (BS)

Site: www.hyterm.com

E-mail: info@hyterm.com

Technical Support:

E-mail: support@hyterm.com

Teams: support@hyterm.com

4 OVERVIEW OF THE POSITIONS

This section contains information on numeric and non-numeric data exchanged with FC400.

4.1 ONLY READ DATA OF FC400

This section contains the information on numeric data reading only.

4.1.1 STATUS PARAMETERS

BYTE NR	DESCRIPTION
0	Hours of operation (regulator powered)
2	Regulator Working Hours (Rotation of the fans CU% > 0)
4	Release FW
6	State of device
8	Number of running fans
10	Total power absorbed by EC Motors
12	Rotation speed of EC Motors
14	Set-Point value in use
16	Input 1 value
18	Input 2 value
20	Input 3 value
22	Input 4 value
24	Input 5 value
26	Input 6 value
28	State of digital inputs
30	Output Value AO1 0-10V
32	Output Value AO2 0-10V
34	State of digital outputs
36	CU Value (Percentage of fans speed command)
38	Warning 1
40	Warning 2
42	Warning 3
44	Error code 1
46	Error code 2
48	Error code 3
50	Error code 4
208	Diagnostica MODBUS

4.2 READ & WRITE DATA OF FC400

This section contains information on data with the possibility both of reading and writing numeric numbers contained in the position.

4.2.1 WORKING PARAMETERS

BYTE NR	DESCRIPTION
52	Set Point 1
54	Set Point 2
56	Proportional band
58	Minimum limit
60	Maximum limit
62	MODBUS slave mode speed set point
64	PID Proportional component weight
66	PID Integral component weight
68	PID Derivative Component weight
70	PID Integration time
72	Pressure Scale

4.2.2 DIGITAL INPUTS

BYTE NR	DESCRIPTION
74	Enabling control functions
76	Digital Input 1
78	Digital Input 2
80	Digital Input 3
82	Digital Input 4
84	Digital Input 5
86	Digital Input 6
88	Digital Input 7

4.2.3 SPECIAL FUNCTIONS

BYTE NR	DESCRIPTION
Description: EMERGENCY SPEED	
90	Enable
92	Rotation speed in EMERGENCY mode
94	Fan start delay
Description: SHEDDING	
96	Enable
98	Number of start attempts
Description: NIGHT	
100	Enable
102	Time of activation of the function
104	Time of deactivation of the function
106	Rotation speed in NIGHT mode
Description: SPEED JUMP	
108	Enable
110	Lower limit jump 1
112	Upper limit jump 1
114	Lower limit jump 2
116	Upper limit jump 2
Description: UNLOCK	
118	Enable
120	Fan rotation time
122	Fan sleep time
124	Rotation speed in UNLOCK mode
Description: CLEAN	
126	Enable
128	Activation frequency
130	Cleaning start time
132	Duration of the cleaning cycle
134	Rotation speed during the cleaning cycle
Description: WASH	
136	Enable
138	Activation frequency
140	Washing start time
142	Cooling duration
144	Duration of the washing cycle
146	Rotation speed during the washing cycle
Description: ECO	
148	Enable
150	Minimum waiting time before the next activation/deactivation
152	Group insertion speed
154	Group deactivation speed
156	Kick Speed

Description: SP SWITCH	
158	Enable
160	Ambient temperature switch SP
162	Hysteresis
Description: SP ADJUST	
164	Enable
166	Min SP
168	Max SP
170	Offset
172	Refrigerant
Description: FLOATING SETPOINT	
174	Enable
176	SP regulation signal
178	SP Minimum value
180	SP Maximum value
Description: FEEDBACK	
182	Enable
184	Activation value
Description: BOOST	
186	Enable
188	Activation value
190	Hysteresis
Description: CUTOFF	
192	Enable
194	Activation value
Description: THERMOSTAT	
196	Enable
198	Activation value
200	Hysteresis
202	Deactivation of the function during regulation
Description: THRESHOLD	
204	Enable
206	Activation value

5 DESCRIPTION OF THE DATA OF FC400

List of the position with detailed description.

5.1 ONLY READ POSITIONS

5.1.1 STATUS PARAMETERS

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
0	Description: Hours of operation (regulator powered)				
	h	0	65535	0	0
2	Description: Regulator Working Hours (Rotation of the fans CU% > 0)				
	h	0	65535	0	0
4	Description: Release FW				
	Byte 1 (less significant) = Build Byte 2 (more significant) = First 4 bit Minor Latest 4 bit (Major)	0	65535	0	R
6	Description: State of device				
	0 = STARTING 1 = STOP 2 = RUNNING	0	2	0	0
8	Description: Number of running fans				
	nr	0	22	0	0
10	Description: Total power absorbed by EC Motors				
	W	0	65535	0	0
12	Description: Rotation speed of EC Motors				
	RPM	0	65535	0	0
14	Description: State of device				
	°C	-15.0	90.0	0.0	0,0
	°F	5.0	194.0	0.0	0,0
	Bar	0.0	45.0	0.0	0,0
	PSI	0.0	652,6	0.0	0,0

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
16	Description: Input 1 value				
	Value	-32768	32767	0	0,0
18	Description: Input 2 value				
	Value	-32768	32767	0	0,0
20	Description: Input 3 value				
	Value	-32768	32767	0	0,0
22	Description: Input 4 value				
	Value	-32768	32767	0	0,0
24	Description: Input 5 value				
	Value	-32768	32767	0	0,0
26	Description: Input 6 value				
	Value	-32768	32767	0	0,0
28	Description: State of digital inputs				
	Bit 0 = DI1 Bit 1 = DI2 Bit 2 = DI3 Bit 3 = DI4 Bit 4 = DI5 Bit 5 = DI6 Bit 6 = DI7	0	248	0	0
30	Description: Output Value AO1 0-10V				
	Volt (0-10V)	0	1000	0	0,00
32	Description: Output Value AO2 0-10V				
	Volt (0-10V)	0	1000	0	0,00
34	Description: State of digital outputs				
	Bit 0 = DO1 Bit 1 = DO2 Bit 2 = DO3 Bit 3 = DO4	0	12	0	0
36	Description: CU value (Percentage of fans command)				
	%	0	100	0	0

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
38	Description: Warning code 1				
	Bit 0 = DATALOGGER Bit 1 = FAN (General notification)	0	65535	0	0
40	Description: Warning code 2				
	Bit 0 = FAN_1 Bit 1 = FAN_2 Bit 2 = FAN_3 Bit 3 = FAN_4 Bit 4 = FAN_5 Bit 5 = FAN_6 Bit 6 = FAN_7 Bit 7 = FAN_8 Bit 8 = FAN_9 Bit 9 = FAN_10 Bit 10 = FAN_11 Bit 11 = FAN_12 Bit 12 = FAN_13 Bit 13 = FAN_14 Bit 14 = FAN_15 Bit 15 = FAN_16	0	65535	0	0
42	Description: Warning code 3				
	Bit 0 = FAN_17 Bit 1 = FAN_18 Bit 2 = FAN_19 Bit 3 = FAN_20 Bit 4 = FAN_21 Bit 5 = FAN_22	0	65535	0	0

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
44	Description: Error code 1				
	Bit 0 = TK DIGITAL INPUT (Function ALARM) Bit 1 = ALL FAN Bit 2 = ANALOG Input Bit 3 = SLAVE SAFETY Bit 4 = Reserved Bit 5 = ADIABATIC COMMUNICATION Bit 6 = COMMUNICATION REMOTE CONTROL Bit 7 = OVER HEAT (board) Bit 8 = UNDER HEAT (board) Bit 9 = POWER	0	65535	0	0
46	Description: Error code 2				
	Bit 0 = FAN_1 Bit 1 = FAN_2 Bit 2 = FAN_3 Bit 3 = FAN_4 Bit 4 = FAN_5 Bit 5 = FAN_6 Bit 6 = FAN_7 Bit 7 = FAN_8 Bit 8 = FAN_9 Bit 9 = FAN_10 Bit 10 = FAN_11 Bit 11 = FAN_12 Bit 12 = FAN_13 Bit 13 = FAN_14 Bit 14 = FAN_15 Bit 15 = FAN_16	0	65535	0	0
48	Description: Error code 3				
	Bit 0 = FAN_17 Bit 1 = FAN_18 Bit 2 = FAN_19 Bit 3 = FAN_20 Bit 4 = FAN_21 Bit 5 = FAN_22	0	65535	0	0
50	Description: Error code 4				
	Bit 0 = ANALOG INPUT 1 Bit 1 = ANALOG INPUT 2 Bit 2 = ANALOG INPUT 3 Bit 3 = ANALOG INPUT 4 Bit 4 = ANALOG INPUT 5 Bit 5 = ANALOG INPUT 6	0	65535	0	0

5.1.2 MODBUS SIDE DIAGNOSTICS

This byte signals a malfunction in the communication side (the regulator doesn't respond to CPE103 queries).

ATTENTION!

When 208 value is greater than 0 wait 60s before triggering an alarm (Communication can automatically re-establish itself within 60s).

BYTE NR	VALUES	MIN	MAX	DEFAULT	ACCESS
Description: FC400 side diagnostics					
208	208 = 0 → COMMUNICATION OK → FC400 OK 208 > 0 → COMMUNICATION KO → FC400 KO	0	255	0	R

5.2 READ & WRITE POSITIONS

5.2.1 WORKING PARAMETERS

ATTENTION!

All data in this section (write mode) are saved in memory of the regulator, write the desired value and then the AUTOSAVE function will save it in memory permanently.

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
52	Description: Set Point 1				
	°C	-15.0	90.0	35.0	0,0
	°F	5.0	194.0	95.0	0,0
	Bar	0.0	60.0	30.0	0,0
	PSI	0.0	870,2	435,1	0,0
54	Description: Set Point 2				
	°C	-15.0	90.0	25.0	0,0
	°F	5.0	194.0	77.0	0,0
	Bar	0.0	60.0	30.0	0,0
	PSI	0.0	870,2	435,1	0,0
56	Description: Proportional band				
	°C	2.0	60.0	7,5	0,0
	°F	35.0	140.0	45,5	0,0
	Bar (PSCALE<=16)	0.0	45.0	2,4	0,0
	Bar (16<PSCALE<45)	0.0	45.0	3,5	0,0
	Bar (PSCALE>=45)	0.0	45.0	5,2	0,0
	PSI (PSCALE<=232,1)	0.0	652,6	34,8	0,0
	PSI (232,1<PSCALE<652,6)	0.0	652,6	50,7	0,0
	PSI (PSCALE>=652,6)	0.0	652,6	75,4	0,0
58	Description: Minimum limit				
	%	0	100	0	0
60	Description: Maximum limit				
	%	0	100	100	0
62	Description: MODBUS slave mode speed set point				
		0	65535	0	0
64	Description: PID Proportional component weight				
	%	0	100	5	0
66	Description: PID Integral component weight				
	%	0	100	5	0

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
68	Description: PID Derivative Component weight				
	%	0	100	5	0
70	Description: PID Integration time				
	s	1	10	1	0
72	Description: Pressure Scale				
	Bar: 0 = 15,0 1 = 16,0 2 = 25,0 3 = 30,0 4 = 40,0 5 = 45,0 6 = 50,0 7 = 60,0	0	7	3	0
	PSI: 0 = 217,5 1 = 232,1 2 = 362,5 3 = 435,1 4 = 580,1 5 = 652,6 6 = 725,2 7 = 870,2	0	7	3	0

5.2.2 DIGITAL INPUTS

ATTENTION!

Enabling control functions (Byte nr 90) is saved in memory of the regulator, write the desired value and then the AUTOSAVE function will save it in memory permanently.

ATTENTION!

Digital Input 1 - 7 (Byte 92, 94, 96, 98, 100, 102, 104) they are not saved in memory, write the desired value continuously over time, if the regulator is turned off the set values will be lost.

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
74	Description: Enabling control functions				
	0 = Local (OFF) 1 = Remote (ON)	0	1	0	0
76	Description: Digital Input 1				
	0 = OFF 1 = ON	0	1	0	0
78	Description: Digital Input 2				
	0 = OFF 1 = ON	0	1	0	0
80	Description: Digital Input 3				
	0 = OFF 1 = ON	0	1	0	0
82	Description: Digital Input 4				
	0 = OFF 1 = ON	0	1	0	0
84	Description: Digital Input 5				
	0 = OFF 1 = ON	0	1	0	0
86	Description: Digital Input 6				
	0 = OFF 1 = ON	0	1	0	0
88	Description: Digital Input 7				
	0 = OFF 1 = ON	0	1	0	0

5.2.3 SPECIAL FUNCTIONS

ATTENTION!

All data in this section (write mode) are saved in memory of the regulator, write the desired value and then the AUTOSAVE function will save it in memory permanently.

5.2.3.1 EMERGENCY SPEED

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
90	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
92	Description: Rotation speed in EMERGENCY mode				
	%	10	100	100	0
94	Description: Fan start delay				
	sec	1	60	5	0

5.2.3.2 SHEDDING

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
96	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
98	Description: Number of start attempts				
	nr	1	200	20	0

5.2.3.3 NIGHT

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
100	Description: Enable				
	0 = OFF 1 = ON (Digital Input) 2 = ON (Automatic Mode)	0	2	1	0
102	Description: Time of activation of the function (Enable = 2)				
	h:min	01:00	23:59	23:00	0
104	Description: Time of deactivation of the function (Enable = 2)				
	h:min	01:00	23:59	6:00	0
106	Description: Rotation speed in NIGHT mode				
	%	1	100	70	0

5.2.3.4 SPEED JUMP

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
108	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
110	Description: Lower limit jump 1				
	%	0	100	0	0
112	Description: Upper limit jump 1				
	%	0	100	0	0
114	Description: Lower limit jump 2				
	%	0	100	0	0
116	Description: Upper limit jump 2				
	%	0	100	0	0

5.2.3.5 UNLOCK

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
118	Description: Enable				
	0 = OFF 1 = ON (Digital Input) 2 = ON (Automatic Mode)	0	2	0	0
120	Description: Fan rotation time				
	min	1	120	15	0
122	Description: Fan sleep time				
	min	1	43000	10080	0
124	Description: Rotation speed in UNLOCK mode				
	%	10	100	100	0

5.2.3.6 CLEAN

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
126	Description: Enable				
	0 = OFF 1 = ON (Digital Input) 2 = ON (Automatic Mode)	0	2	0	0
128	Description: Activation frequency				
	day	1	30	10	0

130	Description: Cleaning start time				
	h:min	01:00	23:59	23:00	0
132	Description: Duration of the cleaning cycle				
	min	1	60	15	0
134	Description: Rotation speed during the cleaning cycle				
	%	1	100	100	0

5.2.3.7 WASH

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
136	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
138	Description: Activation frequency				
	day	1	30	10	0
140	Description: Washing start time				
	h:min	01:00	23:59	23:00	0
142	Description: Cooling duration				
	min	1	60	5	0
144	Description: Duration of the washing cycle				
	min	1	60	15	0
146	Description: Rotation speed during the washing cycle				
	%	1	100	100	0

5.2.3.8 ECO

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
148	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
150	Description: Minimum waiting time before the next activation/deactivation				
	sec	3	90	10	0
152	Description: Group insertion speed				
	%	10	50	25	0
154	Description: Group deactivation speed				
	%	10	50	15	0

156	Description: Kick Speed				
	%	1	100	80	0

5.2.3.9 SP SWITCH

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
158	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
160	Description: Ambient temperature switch SP				
	°C	-10	60	30	0,0
	°F	14.0	140.0	86.0	0,0
162	Description: Hysteresis				
	°C	3.0	20.0	5.0	0,0
	°F	37,4	68.0	41.0	0,0

5.2.3.10 SP ADJUST

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
164	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
166	Description: Min SP				
	°C	0.0	90.0	20.0	0,0
	°F	32.0	194.0	68.0	0,0
168	Description: Max SP				
	°C	0.0	90.0	40.0	0,0
	°F	32.0	194.0	104.0	0,0
170	Description: Offset				
	°C	1.0	20.0	5.0	0,0
	°F	33,8	68.0	41.0	0,0
172	Description: Refrigerant				
	18=R404A	0	33	18	0

5.2.3.11 FLOATING SETPOINT

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
174	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
176	Description: SP regulation signal				
	0 = 1-10V 1 = 4-20mA	0	1	0	0
178	Description: SP Minimum value				
	°C	-15.0	90.0	20.0	0,0
	°F	5.0	194.0	68.0	0,0
	Bar	0.0	60.0	20.0	0,0
	PSI	0.0	870,2	290.0	0,0
180	Description: SP Maximum value				
	°C	-15.0	90.0	40.0	0,0
	°F	5.0	194.0	104.0	0,0
	Bar	0.0	60.0	40.0	0,0
	PSI	0.0	870,2	580.0	0,0

5.2.3.12 FEEDBACK

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
182	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
184	Description: Activation value				
	%	1	20	10	0

5.2.3.13 BOOST

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
186	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
188	Description: Activation value Boost				
	°C	-15.0	120.0	100.0	0,0

	°F	5.0	248.0	212.0	0,0
	Bar	0.0	60.0	45.0	0,0
	PSI	0.0	870,2	652,6	0,0
190	Description: Hysteresis				
	°C	1.0	30.0	3.0	0,0
	°F	33.8	86.0	37.4	0,0
	Bar	0,1	15.0	1.0	0,0
	PSI	1.4	217,5	14.5	0,0

5.2.3.14 CUTOFF

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
192	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
194	Description: Activation value Cutoff				
	°C	-25.0	80.0	20.0	0,0
	°F	-13.0	176.0	68.0	0,0
	Bar	0	60.0	0.0	0,0
	PSI	0	870,2	0.0	0,0

5.2.3.15 THERMOSTAT

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
196	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
198	Description: Activation value				
	°C	-35.0	80.0	15.0	0,0
	°F	-31.0	176.0	59.0	0,0
200	Description: Hysteresis				
	°C	1.0	30.0	5.0	0,0
	°F	33.8	86.0	41.0	0,0
202	Description: Deactivation of the function during regulation				
	0 = Function enabled during regulation 1 = Function disabled during regulation	0	1	0	0

5.2.3.16 THRESHOLD

BYTE NR	VALUES	MIN	MAX	DEFAULT	DECIMALS
204	Description: Enable				
	0 = OFF 1 = ON	0	1	0	0
206	Description: Activation value				
	%	1	100	30	0