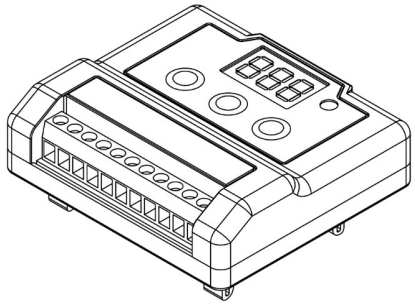
Proportional Controller Modbus RS485 User Manual

SY-DPCA-P-2 / SY-DPCA-C-2



1. Communication Parameters

The default Modbus RS485 communication parameters are as follows (some can be adjusted via the control panel):

Parameter	Settings	Remarks
Device Address	1(01h) ~ 247(F7h)	Default: **1**
Baud Rate	4800、9600、19200、38400、57600	Default: **19200**
Data Bits	8	Fixed
Parity	None (N)	Fixed
Stop Bits	1	Fixed
Protocol Mode	RTU	Fixed
Supported Function codes	**03h** (Read), **06h** (Write)	Others not supported

2. Register Address Table

The following Modbus registers are supported:

Register Address	Name	R/W	Description	Example	
				Decimal	HEX
Real-time Monitor					
0000H	Coil A Output Current	R	Unit: 0.01A (e.g., 67→0.67A)	67	0043h
0001H	Coil A Input Command	R	Unit: 0.1% (e.g., 356→35.6%)	356	0164h
0002H	Coil A Status	R	0: Normal; 1: Current Signal Broken; 2: Overload; 3: Coil Open; 4: Coil Short	0	0000h
0003H	Coil B Output Current	R	Unit: 0.01A (e.g., 67→0.67A)	67	0043h
0004H	Coil B Input Command	R	Unit: 0.1% (e.g., 356→35.6%)	356	0164h
0005H	Coil B Status	R	0: Normal; 1: Current Signal Broken; 2: Overload; 3: Coil Open; 4: Coil Short	0	0000h
Common Parameters					
0006H	Command(1) Selection	R/W	0: 0~10V(Default); 1: 0~5V; 2: 4~20mA	2	0002h
0007H	Command(2) Selection	R/W	0: 0~10V(Default); 1: 0~5V; 2: 4~20mA	2	0002h
0008H	Panel Display Mode	R/W	0: Coil A Current(Default); 1: Coil A Command; 2: Coil B Current; 3: Coil A Command; 4: No Display	0	0000h
0009H	485 Command(1)	R/W	0~100%, Unit: 1% (e.g., 80 → 80%)	80	0050h
000AH	485 Command(2)	R/W	0~100%, Unit: 1% (e.g., 80 → 80%)	80	0050h
000BH	Device Address	R/W	1(01h)~247(F7h) **(Change will be applied after reboot)**	1	0001h

000CH	Baud Rate	R/W	0: 4800; 1: 9600; 2: 19200; 3: 38400; 4: 57600 **(Change will be applied after reboot)**	2	0002h
000DH	Factory Reset	R/W	Write **5** to factory reset addresses 0003H~0027H **(Address and Baud Rate will be reset after reboot)**	5	0005h
Coil A Section					
000EH	Input Selection	R/W	0: Command(1); 1: 485 Command(1)	0	0000h
000FH	Feedback Command	R/W	0: off; 1: Command(1); 2: Command(2)	0	0000h
0010H	Max. Output Current	R/W	0.2~3.00A, Unit: 0.01A (e.g., 300 → 3.00A)	300	012Ch
0011H	Min. Output Current	R/W	0.2~3.00A, Unit: 0.01A (e.g., 300 → 3.00A)	100	0064h
0012H	Ramp Up Time	R/W	0.1~5.0s, Unit: 0.1s (e.g., 50 → 5.0s)	50	0032h
0013H	Ramp Down Time	R/W	0.1~5.0s, Unit: 0.1s (e.g., 10 → 1.0s)	10	000Ah
0014H	Command Deadband	R/W	0~5%, Unit: 1% (e.g., 5 → 5%)	5	0005h
0015H	PWM Frequency	R/W	70~1000Hz, Unit: 10Hz (e.g., 35 → 350Hz)	35	0023h
0016H	Dither Frequency	R/W	70~500Hz, Unit: 10Hz (e.g., 35 → 350Hz)	35	0023h
0017H	Dither Amplitude	R/W	0~25%, Unit: 1% (e.g., 10 → 10%)	10	000Ah
Coil B Section					
0018H	Input Selection	R/W	0: No Output; 1: Command(1); 2: Command(2); 3: 485 Command(1); 4: 485 Command(2)	2	0002h
0019H	Feedback Command	R/W	0: off; 1: Command(1); 2: Command(2)	0	0000h
001AH	Max. Output Current	R/W	0.2~3.00A, Unit: 0.01A (e.g., 300 → 3.00A)	300	012Ch
001BH	Min. Output Current	R/W	0.2~3.00A, Unit: 0.01A (e.g., 300 → 3.00A)	100	0064h
001CH	Ramp Up Time	R/W	0.1~5.0s, Unit: 0.1s (e.g., 50 → 5.0s)	50	0032h
001DH	Ramp Down Time	R/W	0.1~5.0s, Unit: 0.1s (e.g., 10 → 1.0s)	10	000Ah
001EH	Command Deadband	R/W	0~5%, Unit: 1% (e.g., 5 → 5%)	5	0005h
001FH	PWM Frequency	R/W	70~1000Hz, Unit: 10Hz (e.g., 35 → 350Hz)	35	0023h
0020H	Dither Frequency	R/W	70~500Hz, Unit: 10Hz (e.g., 35 → 350Hz)	35	0023h
0021H	Dither Amplitude	R/W	0~25%, Unit: 1% (e.g., 10 → 10%)	10	000Ah
PID Parameters					
0022H	FB Command(A) P	R/W	0~1000	80	0050h
0023H	FB Command(A) I	R/W	0~1000	80	0050h
0024H	FB Command(A) D	R/W	0~1000	80	0050h
0025H	FB Command(B) P	R/W	0~1000	80	0050h
0026H	FB Command(B) I	R/W	0~1000	80	0050h
0027H	FB Command(B) D	R/W	0~1000	80	0050h

3. Error Handling

If an error occurs, the controller responds with:

1. **Error Types:**
   - Unsupported function code (e.g., 04h)
   - Invalid register address (e.g., 000EH out of range)
   - Data value out of range (e.g., writing 400 to 0008H)
   - For other errors such as CRC or frame length errors, controller will discard the message without responding.
2. **Error Response Format:**
   - Original function code **+128 (80h)**
   - Error code: **01h** (indicates the error type)
3. **Example:**
   - Host request 01 04 0008 0001 (invalid function code 04h)
   - Controller response 01 84 01 (84h = 80h + 04h, 01h = error code)

4. Communication Examples

Example 1: Reading Data

Read "Coil A Output Current (0000H)" and "Coil A Input Command (0001H)" from device address 01h.

Host Request

01 03 0000 0002 C40B

- 01: Device address
- 03: Function code (Read)
- 0000: Start address (0000H)
- 0002: Read 2 registers
- C40B: CRC checksum

Controller Response

01 03 04 006E 0212 1A83

- 01: Device address
- 03: Function code (Read)
- 04: Byte count (4 bytes)
- 006E: 0000H value (0x006E = 110 → 1.10A)
- 0212: 0001H value (0x0212 = 530 → 53.0%)
- 1A83: CRC checksum

Example 2: Writing Data

Set "Coil A PWM Frequency (0014H)" to 250Hz for device address 0Eh.

Host Request

0E 06 0014 0019 2607

- 0E: Device address
- 06: Function code (Write)
- 0014: Target address (0014H))
- 0019: Value (0x0019 = 25 → 250Hz)
- 2607: CRC checksum

Controller Response

0E 06 0014 0019 2607

- Echoes the request to confirm successful write.

5. PC Communication Software

Using a USB-RS485 converter, you can operate and configure parameters via the PC software available on our website.

Installation Guide

Step 1: Insert the converter into the USB port on the PC.

Step 2: Install the converter driver (only required for the first use).

Step 3: Connect the controller and the converter.

Step 4: Launch the PC software (download link: https://www.sunstaryuya.com.tw/product-sy-dpca-c-2-en.html).

Step 5: Follow the instructions within the software to proceed.

6. Notes

1. **Timeout**: Ensure **>10ms** idle time between messages.
2. **CRC Checksum**: Mandatory for all messages (use standard Modbus RTU CRC calculation).
3. **Address Range**: Only 0000H~000DH registers are valid.
4. All parameters configured through Modbus will be saved automatically.