PTA8C04 4CH PT100 RS485 sensor protocol

Function code

RS485 address (Station address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16 (2)
	03 Read			
	06/16 Write			

Read-only register,Read Function code Is 03				
Register address	Register contents	Number of bytes	Units	Remarks
0x0000-0x0003	CH0-CH3 Temperature value	2	0.1℃	For example, the data is 255, which is equal to 25.5 ℃
0X0020-0X0023 (32-35)	CH0-CH3 PT100 resistance value	2	0.1Ω	For example, the data is 1000, which is equal to 100.0Ω
Read / write register; Read function code is 03 ,Write function code is 06 and 16(0x10)				
0X0040-0X0043 (64-67)	CH0-CH3 Temperature correction value This register can only be written Data read: 0XFFFF	2	0.1℃	If the temperature is deviated, please input the correct temperature value for correction
0X0060-0X0063 (96-99)	CH0-CH3 PT100 resistance correction positive value This register can only be written Data read: 0XFFFF	2	0.1Ω	If the PT100 resistance value is deviated, please input the correct resistance value for correction

0x00FA (250)	Automatic upload of temperature	2		Second	0: Query function (default) 1-255: Automatically report, the unit is second. 1: Report every 1 second 2: Report every 2 seconds 10: Report every 10 seconds Maximum interval of 255 seconds
0x00FB (251)	Factory data reset	2			The address code is 0XFF, and at the current baud rate, enter the following commands to restore the factory settings: FF 06 00 FB 00 00 ED E5
0x00FC (252)	Data return delay	2		0~1000	After receiving the command, return the data interval time (unit MS)
0x00FD (253)	RS485 address (Station address)	2			Read Address 0XFF Write Address 1-254
0x00FE (254)	Baud rate	2			0~8 0：1200； 1：2400；2：4800； 3：9600；4：19200； 5：38400；6：57600； 7：115200 8: Factory reset
0x00FF (255)	Parity	2			0 None Parity 1 Even Parity

				2 Odd Parity

Serial baud rate：9600（default），N，8，1

Modbus RTU Communication protocol：

1. Read temperature

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Function code 0x03

Register address：0x0000~0x0003

Read number：0x0004

The return of the temperature data is two bytes，High-bit in the former and low-bit in the post，convert it to decimal and divided by 10, is the current temperature value；The highest bit 1 indicates a negative value， this value directly subtracting 65536，is the current temperature value.

For example,Read the temperature value of channel 0:

send data(RS485 address is 1)：01 03 00 00 00 01 84 0A

Returns data：01 03 02 00 DB F8 1F

01 RS485 address，03 Function，02 length， F8 1F crc16

00DB is the temperature value, the highest bit is 0, so the temperature is positive, it is converted to decimal = 219, 219/10=21.9 is the current temperature value；

Returns data：01 03 02 FF 90 F2 3F

FF90 is the temperature value, the highest bit is 1, so the temperature is negative, it is converted to decimal = 65424, (65424-65536)/10=-11.2 is the current temperature value

2. **Read resistance value of PT100 sensor (corresponding to temperature)**

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Function code 0x03

Register address：0x0020~0x0023

Read number：0x0004

The return of the resistance value data is two bytes，High-bit in the former and low-bit in the post，convert it to decimal and divided by 10, is the resistance value ；

For example, Read the resistance value of channel 1:

send data(RS485 address is 1)：**01 03 00 20 00 01 85 C0**

Returns data：01 03 02 04 64 BB 6F

01 RS485 address，03 Function，02 length，BB 6Fcrc16

0464is the resistance   value, it is converted to decimal = 1124, 1124/10=112.4 is the resistance value；

3. **Read RS485 address**

Send data

RS485 address (Broadcast address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16(2)

Returns data

RS485 address (Broadcast address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Broadcast address 0xff

Function code 0x03

Register address：0x00FD

Read number：0x0001

For example:

send data：FF 03 00 FD 00 01 00 24

Returns data：FF 03 02 00 01 50 50

FF Broadcast address，03 Function，02 length，01 is the current module RS485 address , 50 50 crc16

Note: When using this command, only one temperature module can be connected to the RS485 bus, more than one will be wrong!

4. **Write RS485 address**

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Setting Content (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Register value (2)	CRC16(2)

Function code 0x06/0x10

Register address：0x00FD

Setting Content：2Bytes(1-254)

For example, The current RS485 address is 1, We need to change the RS485 address to 3:

send data(RS485 address is 1)：01 06 00 FD 00 03 58 3B

Returns data：01 06 00 FD 00 03 58 3B

5. Read baud rate

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Function code 0x03

Register address: 0x00FE

Read number: 0x0001

For example:

send data(RS485 address is 1): 01 03 00 FE 00 01 E5 FA

Returns data: 01 03 02 00 03 F8 45

01 RS485 address, 03 Function, 02 length, F8 45 crc16

03 means the current baud rate is 9600bps

Baud rate corresponds to the number: 0: 1200; 1: 2400; 2: 4800; 3: 9600; 4: 19200; 5: 38400; 6: 57600; 7: 115200.

6. Write baud rate

Send data

Slave ID(Device Address) (1)	Function (1)	Register address (2)	Setting Content (2)	CRC16(2)

Returns data

Slave ID(Device Address) (1)	Function (1)	Register address (2)	Register value (2)	CRC16(2)

Function code 0x06

Slave ID : 0x01~0xFE

Register address: 0x00FE

Setting Content: 2Bytes(0-8)

For example, Change the baud rate to 4800bps:

send data(Slave ID is 1): 01 06 00 FE 00 02 69 FB

Returns data: 01 06 00 FE 00 02 69 FB

Baud rate corresponds to the number: 0: 1200; 1: 2400; 2: 4800; 3: 9600; 4: 19200; 5: 38400; 6: 57600; 7: 115200   8: Factory reset

Note: 1 The baud rate will be updated when the module is powered up again!

   2 The factory setting can be restored when the baud rate corresponding to the number is 8. For example: 01 06 00 FE 00 08 E9 FC

7. Set the temperature correction value

If the collected temperature deviates from the actual temperature, please input the correct temperature value in this register.

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Setting Content (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Register value (2)	CRC16(2)

Function code 0x06/0x10

Register address：0x0040~0x0043

Setting Content：2Bytes

Setting value: 2 bytes, the highest bit represents the sign of positive and negative values, 0 represents positive, 1 represents negative, and the unit is 0.1°C. When the highest bit is 1, it means a negative value. At this time, you need to add 1 to this value, or you can directly subtract 65536 from this value to get the current temperature value.

For example 1: The correct temperature is 25.5°C, and the temperature read is 26.4°C. It can be corrected by entering the correct temperature. 25.5*10=255, converted to hexadecimal 0XFF

Send frame: 01 06 00 40 00 FF C8 5E

Return frame: 01 06 00 40 00 FF C8 5E The return frame is the same as the send frame.

For example 2: Change the temperature to -12.1℃, 65536-121=65,415 =0XFF87

Send frame: 01 06 00 40 FF 87 89 8C

Return frame: 01 06 00 40 FF 87 89 8C The return frame is the same as the send frame.

8. Set PT100 resistance correction value

If the collected PT100 resistance value deviates from the actual resistance value, please input the correct resistance value in this register.

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Setting Content (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Register value (2)	CRC16(2)

Function code 0x06/0x10

Register address：0x0060~0x0063

Setting Content：2Bytes

For example : The current PT100 resistance is 100Ω, and the read value is 102Ω. It can be corrected by entering the correct resistance value. 100*10=1000, converted to hexadecimal 0X03E8

Send frame: 01 06 00 60 03 E8 89 6A

Return frame: 01 06 00 60 03 E8 89 6A The return frame is the same as the send frame.

9. Read temperature automatic reporting function

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Function code 0x03

Register address：0x00FA

Read number：0x0001

For example:

send data(RS485 address is 1)：01 03 00 FA 00 01 A4 3B

Returns data：01 03 02 00 00 B8 44

01 RS485 address，03 Function，02 length，00 means query function ,

B8 44 crc16

10. Set temperature automatic reporting function

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Setting Content (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Register value (2)	CRC16(2)

Function code 0x06/0x10

Register address：0x00FA

Setting Content：1Bytes

For example : For example, the current query function should be changed to automatic reporting:

Automatically report in 1 second, send frame (address is 1) 01 06 00 FA 00 01 68 3B

Automatically report in 2 second, send frame (address is 1) 01 06 00 FA 00 02 28 3A

Automatically report in 3 second, send frame (address is 1) 01 06 00 FA 00 03 E9 FA

Automatically report in 4 second, send frame (address is 1) 01 06 00 FA 00 04 A8 38

Automatically report in 5 second, send frame (address is 1) 01 06 00 FA 00 05 69 F8

Automatically report in 10 second, send frame (address is 1) 01 06 00 FA 00 0A 29 FC

Disable reporting function: send frame (address is 1) 01 06 00 FA 00 00 A9 FB

11. **Read serial port check digit：**

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Setting Content (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Register value (2)	CRC16(2)

Function code 0x03

Register address：0x00FF

Setting Content：0x0001

For example：

send data(RS485 address is 1)：01 03 00 FF 00 01 B4 3A

Returns data：01 03 02 00 00 B8 44

01 address code, 03 function code, 02 length, 00 00 means the current check digit is no check, B8 44 crc16 check.

The corresponding number of the parity bit: 0: no parity; 1: even parity; 2: odd parity.

12. Set serial port check digit：

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Setting Content (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Register value (2)	CRC16(2)

Function code：0x06/0x10

Register address：0x00FF

Setting Content：Bytes (0~2)

For example，Change the parity bit to even parity：

send data(RS485 address is 1):01 06 00 FF 00 01 78 3A

Returns data：01 06 00 FF 00 01 78 3A

The corresponding number of the parity bit: 0: no parity; 1: even parity; 2: odd parity.

13. **Read return delay time：**

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Broadcast address 0x01~0xFE

Function code 0x03

Register address：0x00FC

Read number：0x0001

For example：

send data(RS485 address is 1)：01 03 00 FC 00 01 44 3A

Returns data：01 03 02 00 00 B8 44

01 address code, 03 function code, 02 length, 0000 means the return delay time is 0ms, B8 44 crc16 check.

14. Set the return delay time：

Send data

RS485 address (Station address) (1)	Function (1)	Register address (2)	Read number (2)	CRC16(2)

Returns data

RS485 address (Station address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Function code：0x06/0x10

Register address：0x00FC(252)

Setting Content：2 Bytes (0~1000)

For example, Set the data return delay to 200ms,

send data(RS485 address is 1)：01 06 00 FC 00 C8 48 6C

Returns data：01 06 00 FC 00 C8 48 6C

Factory reset:

Send data

RS485 address	Function	Register address	Read number (2)	CRC16(2

(Station address) (1)	n (1)	(2)		)

Returns data

RS485 address (Station address) (1)	Function (1)	Number of bytes (1)	data (n)	CRC16(2)

Modbus Address(PLC)：40252

RS485 address : 0x01~0x3F

Function code:Write 0x06;

Register address:0x00FB(251)

Send data(address 1):FF 06 00 FB 00 00 ED E5

Return data   :FF 06 00 FB 00 00 ED E5

For Command reset details, see: "AMIOA08 Factory Reset"

Link :https://1drv.ms/u/s!Av4PLxH_z8f1mBCFrTZWZSsyyg4l?e=fgC5o