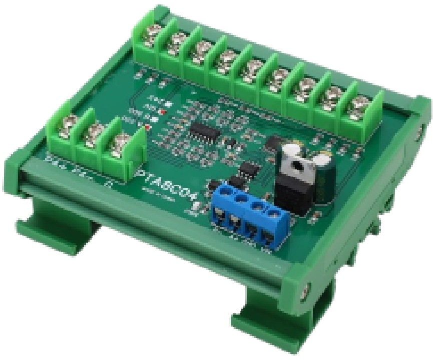
lamaPLC: PTA8C04 4-channel PT100 Modbus Modul

PTA8C04 is a specific model of 4-Channel PT100 RTD Temperature Sensor Module that uses RS485 communication for industrial monitoring, enabling it to read temperatures from multiple PT100 resistance temperature detectors (RTDs) and transmit data via the Modbus RTU protocol for PLCs and other controllers, often mounted on DIN rails.




PTA8C04 Description

- Operating Temperature: -40 to 85°C
- Working Voltage: DC 12V/24V
- Working Current: 14-18 mA
- Compatible Sensor: PT100 3-wire or 2-wire
- PT100 Sensor Range: Version A -40℃ to +220℃, Version B -40℃ to +500℃
- Temperature Measurement Accuracy: 1%
- DIN Rail: PCB board width UM72 (72mm) for DIN35 / C45 rail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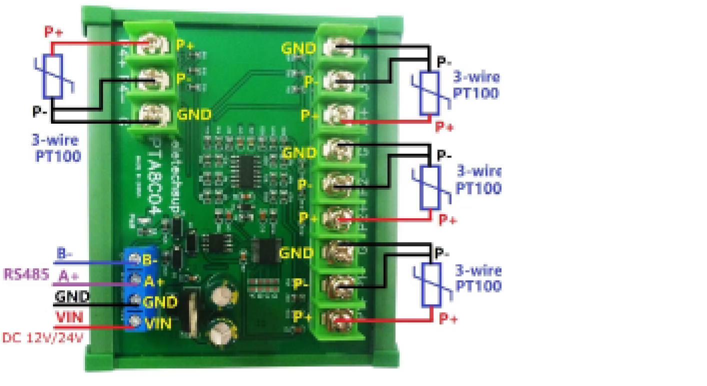
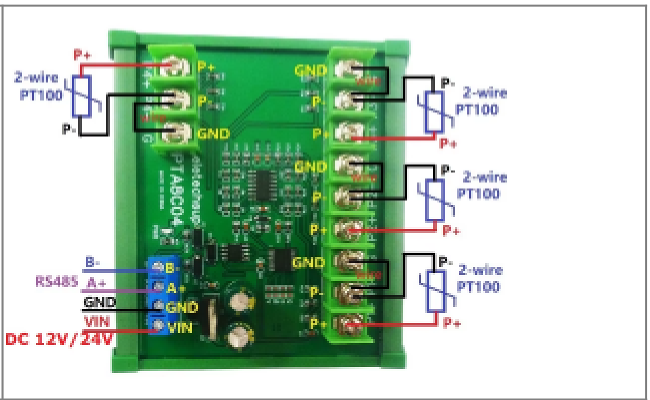
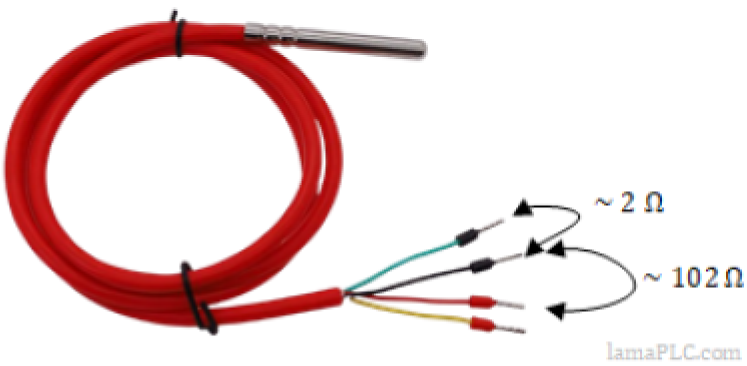
PTA8C04 Probe wiring mode

	
3-wire probe wiring mode: connect the red wire to P+, and the other two wires of the same color to P- and GND (the ports are not distinguished)	2-wire probe wiring mode: connect the red wire to P+, the blue wire to P-, and G

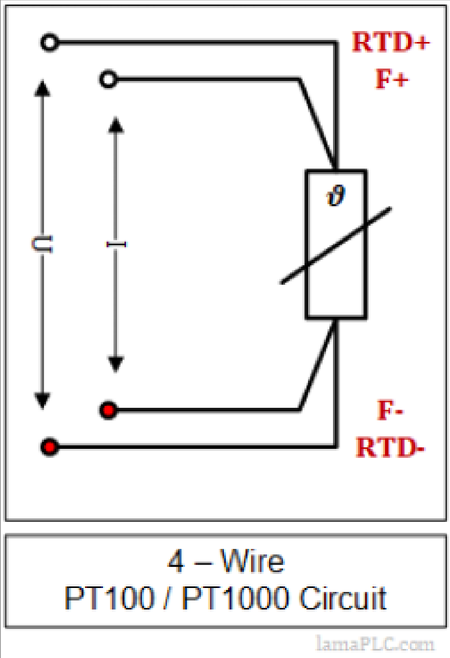
PT100 / PT1000 sensors

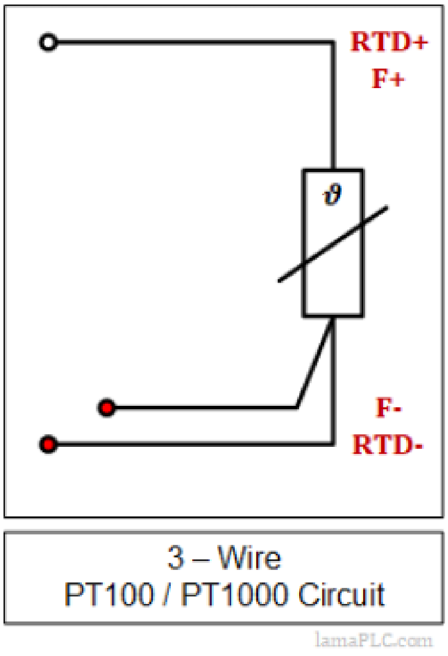
RTDs (*Resistance Temperature Detectors*) are straightforward devices: simply a small strip of platinum that measures precisely 100 Ω or 1000 Ω at 0°C. Bonded to the PT100/PT1000 are two, three, or four wires.

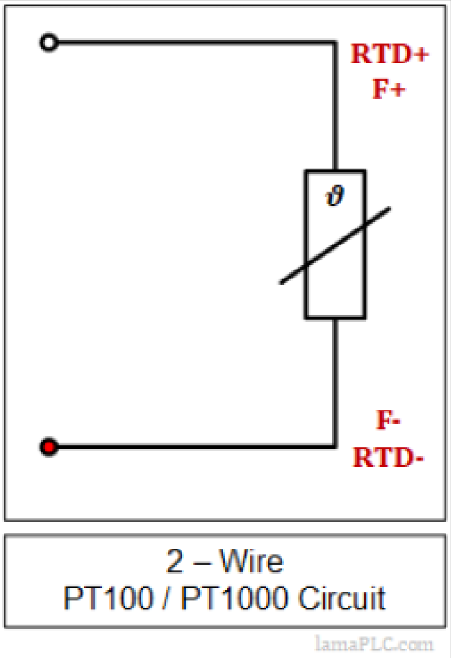


Thus, the 4-wire RTD has two wires attached to each side of the sensor. Each wire has about 1Ω of resistance. When connected to the amplifier, the innovative amp measures the voltage across the RTD and across the wire pairs.

For example, the approximate resistances of a 4-wire PT100 RTD at 0 °C are as follows. (For a PT1000, the middle resistance would be about 1002Ω rather than 102Ω).







When the amp measures this sensor, it first assesses the resistance between one set of red and blue wires. It then measures the resistance between the red wires and the blue wires. To get the resistance of a single wire, divide each resistance value by two. The final calculation is 102 - 1 - 1 100Ω.	These are very similar to the 4-wire type, but only have one 'pair' of connected wires. This is because the wires for the RTD are all the same gauge and length; therefore, instead of two pairs, the amplifier reads one pair and uses that resistance for both wires.	It is as simple as it gets, with only one wire on each side. You might need to calibrate the sensor by placing it in an ice bath to measure the resistance at 0°C (around 102 Ω), then subtract 100 Ω to find the total resistance of the connection wires!

Connect the two ends of the PT100/PT1000 resistor to the RTD+ and RTD- terminals on the sensor module. For example, a resistance of 102 Ohms can be measured. In a 3-wire or 4-wire setup, the wire connections go to the F+ and F- terminals. These connections might differ from the resistance values of the respective sides by only a few Ohms, meaning the resistance between F+ and RTD+ or F- and RTD- may vary slightly, just a few Ohms.

°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
-200	18,49	0	100,00	200	175,84	400	247,04	600	313,59	800	375,51
-190	22,80	10	103,90	210	179,51	410	250,48	610	316,80	810	378,48
-180	27,08	20	107,79	220	183,17	420	253,90	620	319,99	820	381,45
-170	31,32	30	111,67	230	186,82	430	257,32	630	323,18	830	384,40
-160	35,53	40	115,54	240	190,45	440	260,72	640	326,35	840	387,34
-150	39,71	50	119,40	250	194,07	450	264,11	650	329,51	850	390,26
-140	43,87	60	123,24	260	197,69	460	267,49	660	332,66		
-130	48,00	70	127,07	270	201,29	470	270,86	670	335,79		
-120	52,11	80	130,89	280	204,88	480	274,22	680	338,92		
-110	56,19	90	134,70	290	208,45	490	277,56	690	342,03		
-100	60,25	100	138,50	300	212,02	500	280,90	700	345,13		
- 90	64,30	110	142,29	310	215,57	510	284,22	710	348,22		
- 80	68,33	120	146,06	320	219,12	520	287,53	720	351,30		
- 70	72,33	130	149,82	330	222,65	530	290,83	730	354,37		
- 60	76,33	140	153,58	340	226,17	540	294,11	740	357,42		
- 50	80,31	150	157,31	350	229,67	550	297,39	750	360,47		
- 40	84,27	160	161,04	360	233,17	560	300,65	760	363,50		
- 30	88,22	170	164,76	370	236,65	570	303,91	770	366,52		
- 20	92,16	180	168,46	380	240,13	580	307,15	780	369,53		
- 10	96,09	190	172,16	390	243,59	590	310,38	790	372,52		

Basic resistance values in Ohm PT100 sensors according to DIN/IEC 751

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rtd, pt100, pt1000, sensor, temperature

PTA8C04 Modbus settings

Default settings: SlaveID: 1, 9600 baud, parity: N,8,1

holding register addresses	Number of registers	Description	Unit	Note
0 .. 3	4	CH0 .. CH03 Temperature values	0.1 °C	read-only, 182 → 18.2 °C
32 .. 35	4	CH0 .. CH03 Resistance values	0.1 Ω	read-only, 1081 → 108.1 Ω
64 .. 67	4	CH0 .. CH03 Temperature correction values	0.1 °C	r/w; read 0xFFFF
96 .. 99	4	CH0 .. CH03 Resistance correction values	0.1 Ω	r/w; read 0xFFFF
250	1	Automatic upload of temperature	Second	0: by query (default), 1..255 sec raster
251	1	Factory data reset	-	Feedback by reset: FF 06 00 FB 00 00 ED E5
252	1	Data return delay	ms	0..1000
253	1	RS 485 Modbus RTU Address		Read: 0xFFFF, write 0..254
254	1	Baudrate		0..8; 0: 1200, 1: 2400, 2: 4800, 3: 9600 (default), 4: 19200, 5: 38400, 6: 57600, 7: 115200, 8: Factory reset
255	1	Parity		0: none (default), 1: even, 2: odd

Arduino

The PTA8C04 is a 4-channel PT100 RTD acquisition module that communicates via RS485 Modbus RTU, which is fundamentally different from the SPI-based MAX31865. To use it with an Arduino, you typically need an RS485 to TTL converter (like a MAX485 module) and a Modbus library.

Hardware Connections

Connect your Arduino to the PTA8C04 through an RS485 converter:

- **VCC/GND:** 12V–24V DC to PTA8C04; 5V/GND to RS485 converter.
- **A/B Pins:** Connect A to A and B to B between the PTA8C04 and the RS485 converter.
- **RO (Receive):** Arduino Pin 2 (if using SoftwareSerial).
- **DI (Driver Input):** Arduino Pin 3.
- **DE/RE (Enable):** Arduino Pins 4 & 5 (tied together to control direction).

Arduino Example Code

This code uses the **ModbusMaster** library to read temperatures from the first two channels.

```
#include <ModbusMaster.h>
#include <SoftwareSerial.h>

#define MAX485_RE_DE 4  // Pins for RE and DE
SoftwareSerial rs485(2, 3); // RX, TX

ModbusMaster node;

void preTransmission() { digitalWrite(MAX485_RE_DE, 1); }
void postTransmission() { digitalWrite(MAX485_RE_DE, 0); }

void setup() {
  pinMode(MAX485_RE_DE, OUTPUT);
  digitalWrite(MAX485_RE_DE, 0); // Start in receive mode

  Serial.begin(9600);
  rs485.begin(9600); // PTA8C04 default baud is 9600

  node.begin(1, rs485); // Default slave ID is 1
  node.preTransmission(preTransmission);
  node.postTransmission(postTransmission);
}

void loop() {
  // Read 4 registers starting at 0x0000 (Channels 1-4)
  uint8_t result = node.readHoldingRegisters(0x0000, 4);

  if (result == node.ku8MBSuccess) {
    for (int i = 0; i < 4; i++) {
      int16_t rawTemp = node.getResponseBuffer(i);
      // PTA8C04 provides temperature x10. Divide by 10.0 for Celsius
      float celsius = rawTemp / 10.0;
      Serial.print("CH"); Serial.print(i+1);
      Serial.print(": "); Serial.print(celsius); Serial.println(" C");
    }
  } else {
    Serial.print("Modbus Error: "); Serial.println(result, HEX);
  }
  delay(2000);
}
```

Modbus topics on lamaPLC

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• lamaLib: #temp	2026/04/23 21:52	tia, scl, lamalibsimatic, source code, energy meter, modbus, register, word

• lamaLib: energyMeterToModbusRegs	2026/04/23 21:52	tia, scl, lamalibsimatic, source code, energy meter, modbus, register, word
• lamaPLC Communication: Modbus	2026/04/23 21:51	modbus, communication, bus, modicon, standard, rtu, tcp, multimaster, coil, register
• lamaPLC: B+G E-Tech DS100 Energy Meter with Modbus	2026/06/05 15:59	communication, modbus, b g, e-tech, ds100, energy meter, em
• lamaPLC: Communication with Eastron Smart X96	2026/06/05 15:59	communication, modbus, energy meter, em, eastron, smart, x96
• lamaPLC: DM56A04 / DM36B06 digital tube display with Modbus Communication	2026/02/14 18:25	dm56a04, dm36b06, eletechsup, 7-segment, display, modbus, rtu, modbus rtu, arduino
• LamaPLC: Eastron SDM 230 with Modbus Communication	2026/06/05 15:50	modbus, modbus rtu, eastron, modbus map, mid, sdm 230, sdm, arduino, code
• LamaPLC: Eastron SDM 630 Energy Meter with Modbus communication	2026/06/05 15:50	modbus, modbus rtu, eastron, modbus map, mid, sdm, sdm 630, arduino, code
• LamaPLC: Eastron SDM 72	2026/06/09 21:11	modbus, modbus rtu, eastron, modbus map, mid, sdm 72, sdm, arduino, code
• lamaPLC: Measurement	2026/06/05 15:43	energy meter, em, communication, modbus, easton, sdm120, xtm35sc, sdm230, ds100-00b, b g e-tech, sdm54, sdm72, sdm630, smart, x96-5, x96-5fj
• lamaPLC: PTA8C04 4-channel PT100 Modbus Modul	2026/02/14 18:42	pta8c04, sensor, modbus, rtu, rs-485, communication, platine, um72
• lamaPLC: RP2040_ETH_Modul: Modbus TCP example	2026/05/12 16:20	code, micropython, 2026, rp2040 eth, modbus, test
• lamaPLC: RP2040_ETH_Modul: Modbus TCP sniffer	2026/05/12 16:20	code, micropython, 2026, rp2040 eth, modbus, sniffer
• LamaPLC: S7-1500 and Metrawatt EM2389 Modbus TCP communication	2026/04/23 21:52	simatic, s7, modbus, communication, metrawatt, em2389, source code, scl, mid
• LamaPLC: S7-1500 and Sicam Q200 Modbus TCP communication	2026/04/23 21:52	simatic, s7, modbus, tia portal, communication, sicam, q200, sicam q200, source code, scl, class a
• lamaPLC: S7-1500 and UICPAL Temp.humi.sensor Modbus TCP communication	2026/04/23 21:52	bus, communication, s7, simatic, s7 1500, s7 1200, scl, uicpal, temperature, humidity, modbus, example, download, tia portal
• lamaPLC: TM1650 7-Segment Display with I²C like or Modbus Communication	2026/02/14 18:26	tm1650, stc8g, tp8485e, hyuduo5x1b64edtk1244, 7-segment, display, modbus, rtu, modbus rtu, arduino
• lamaPLC: TTL to RS485 Module	2026/02/14 23:49	modbus, rtu, modbus rtu, hw-097, rs-485, max485
• LamaPLC: UICPAL Temp.humi.sensor	2023/06/25 00:43	simatic, s7, modbus, communication, temperature, humidity, sensor
• LamaPLC: XTM35SC Energy meter with Modbus communication	2026/06/05 15:59	xtm35sc, modbus, modbus rtu, measuring, power, communication, current meter, voltmeter
• lamaPLC: YR-3180 - Weight sensor module with UART or Modbus communication	2026/02/15 00:00	communication, modbus, rtu, sensor, weight, yr-3180, hx710b, arduino, ttl, rs-485

• Modbus for Grundfos pumps	2026/04/23 21:51	modbus, modbus tcp, modbus rtu, grundfos
• NT18B07: 7 Kanal RS485 Temperatur Sensor with Modbus RTU	2026/02/14 18:49	nt18b07, sensor, modbus, rtu, rs-485, communication, platine
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• Waveshare	2026/04/23 21:52	waveshare, converter, modbus, modbus rtu, modbus tcp, communication
• XTM35SC current / voltage meter	2026/04/23 21:52	xtm35sc, modbus, modbus rtu, measuring, power, communication, current meter, voltmeter

PTA8C04, sensor, Modbus, RTU, RS-485, communication, Platine, UM72

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