

# AI08T

## 8 Channel PT100/PT1000 Module

**Data Sheet**

Doc: 40456 v1.00





**INTRODUCTION**

The AI08T module is an 8-channel RTD module that measures temperature for PT100 and PT1000 sensors. The PT100 and PT1000 mode can be chosen by jumper on the module. The module can be used with both 3 and 2 wire RTD sensors.

The Brodersen LB2 modules can be used with the RTU32N and RTU32M series products. The I/O modules are in two parts, a bottom part containing the backplane bus, and a top part containing the I/O board and logic. All LB2 I/O modules are hot pluggable and equipped with a 200 MHz processor to handle filtering, de-bouncing and logic processing of I/O.

Module firmware updates are managed by the RTU using Brodersen Worksuite. Use only genuine Brodersen bus cables for connection to Brodersen RTUs and extension of I/O module blocks. The LB2 connection cables are made to handle the power and shielding requirements of the LB2 bus communications. The maximum overall length of complete system is 30m. Each I/O module & Power supply module is calculated as 2cm. The cables are as their length indicates, e.g., UCC-610/100 cable is 100 cm.

Before using the LB2 Series I/O Modules, read the LB2 User manual.

The maximum number of I/O modules on one LB2 Bus is 60.

**Cable ordering codes:**

- UCC-610/25 25cm LB2 Cable
- UCC-610/50 50cm LB2 Cable
- UCC-610/100 100cm LB2 Cable
- UCC-610/200 200cm LB2 Cable

**POWER SUPPLY MODULE BACKPLANE PART**

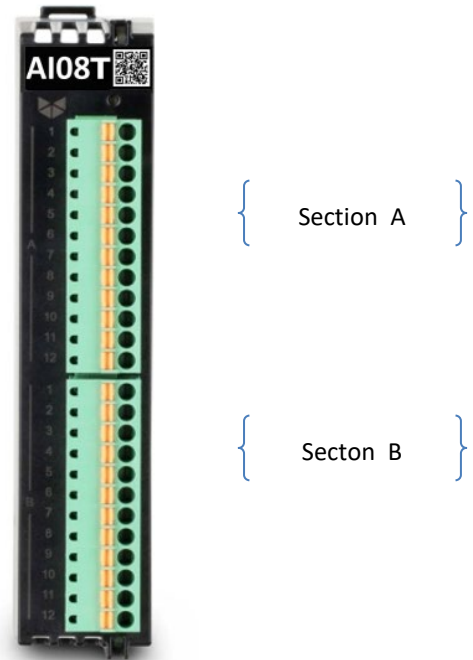
Description	Part Nr.
BUS module for IOs, Start	BB21A
BUS module for IOs, Middle	BB21B
BUS module for IOs, Extension	BB21C

**VERSIONS / ORDERING CODES**

Order code: AI08T

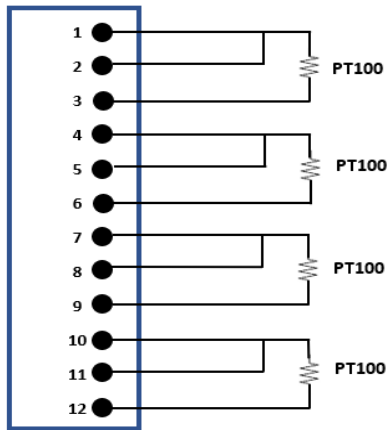
**I/O INTERFACE**

2x 12 way 3.5mm pluggable spring clamp connectors. The maximum conductor cross sectional area is AWG 16 (1.3mm<sup>2</sup>). The wire conductor type should be Copper and it must meet the minimum temperature criteria of 105°C.



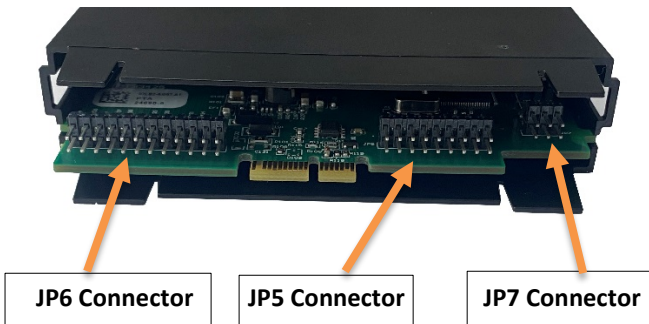
**TERMINAL LAYOUT**

Top (section A)		Bottom (section B)	
Pin 1	CH0	Pin 1	CH4
Pin 2	CH0	Pin 2	CH4
Pin 3	CH0	Pin 3	CH4
Pin 4	CH1	Pin 4	CH5
Pin 5	CH1	Pin 5	CH5
Pin 6	CH1	Pin 6	CH5
Pin 7	CH2	Pin 7	CH6
Pin 8	CH2	Pin 8	CH6
Pin 9	CH2	Pin 9	CH6
Pin 10	CH3	Pin 10	CH7
Pin 11	CH3	Pin 11	CH7
Pin 12	CH3	Pin 12	CH7



Electrical diagram PT100 or PT1000 input Connection

**Jumper Configuration for PT100 & PT1000 mode**

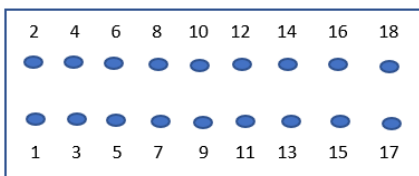


Select PT100 or PT1000 mode for the RTD sensor measurement by setting the jumper on the JP5, JP6 and JP7 connectors for the 8 channels as shown below.

**Pin Connection for JP5 Connector:**

Channel number	PT100 mode pin connection	PT1000 mode pin connection
CH0	1,3 & 2,4	3,5 & 4,6
CH1	7,9 & 8, 10	9,11 & 10,12
CH2	13,15 & 14,16	15,17 & 16,18

Pin connection for JP5 connector

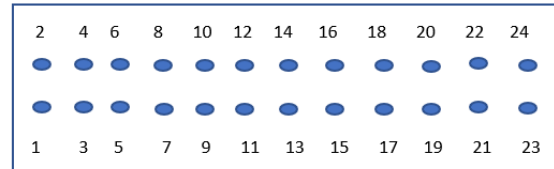


JP5 connector

**Pin Connection for JP6 Connector:**

Channel number	PT100 mode pin connection	PT1000 mode pin connection
CH3	1,3 & 2,4	3,5 & 4,6
CH4	7,9 & 8, 10	9,11 & 10,12
CH5	13,15 & 14,16	15,17 & 16,18
CH6	19,21 & 20,22	21,23 & 22,24

Pin connection for JP6 connector

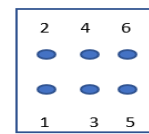


JP6 connector

**Pin Connection for JP7 Connector:**

Channel number	PT100 mode pin connection	PT1000 mode pin connection
CH7	1,3 & 2,4	3,5 & 4,6

Pin connection for JP5 connector



JP7 connector

**ELECTRICAL CHARACTERISTICS**

**Power consumption (from backplane bus):**

- Current consumption: 80mA (typ.) @ 12V
- Power consumption: 1W (typ.)

**Number of input channels:** 8 channels PT100/P1000

**Wire Connections:** 2 or 3 wire connection

**Temperature Measurement:** -100°C to 300°C

**Measurement Resolution:** 0.1°C

**Measurement Accuracy:** ± 0.5°C

**Effective resolution:** 16 bits

**Update time:** 40ms (for all 8 channels)

**Accuracy (at 25°C):** ±0.1%

**Temperature drift:** ± 25ppm/°C

**Power-freq. noise rejection:** 50Hz/60Hz

**Input impedance:** > 1MΩ

**Isolation:**

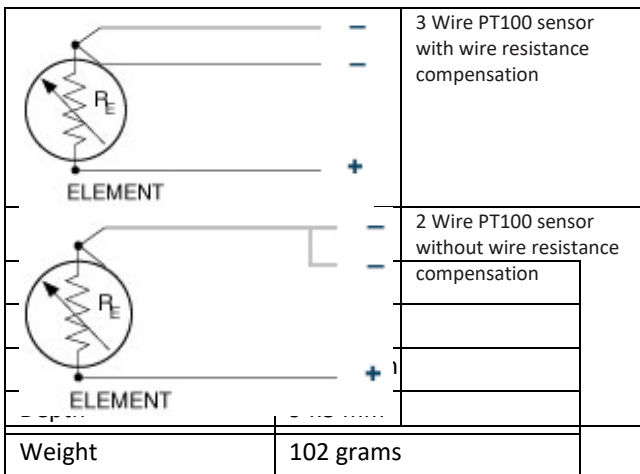
- Input to digital: At least 1KV
- Channel to channel: At least 250V



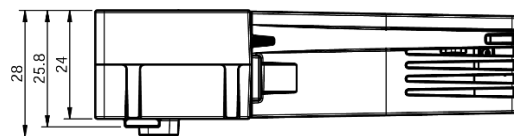
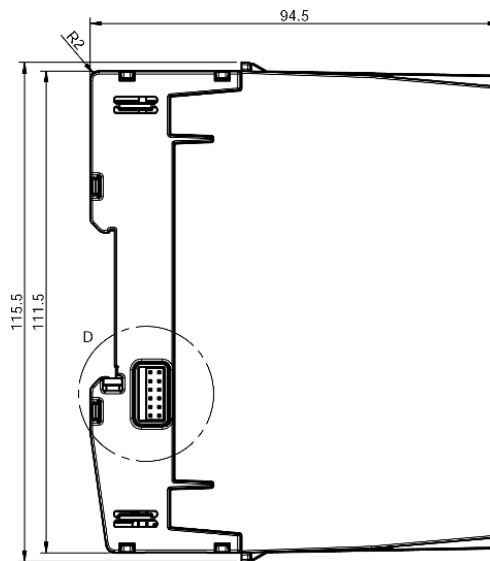
### TEMPERATURE MEASUREMENT

8 channel Input	3 or 2 wire connection
Measurement mode	PT100 or PT1000
Resolution	16 bit
Update time	40 ms
Accuracy (at 25°C)	±0.1%
Temperature drift: ± 25ppm/°C	± 25ppm/°C
Power-freq. noise rejection	50Hz/60Hz
Measured temperature range	-100 to 300 °C

### PT100 & PT1000 wire connection



### MECHANICAL



### ENVIRONMENTAL CONDITIONS

Ambient operating temperature range	-25°C to +75°C
Ambient Storage temperature range	-40°C to +85°C
Marked degree of protection	IP20
Humidity	0...99.8%
Ventilation Restrictions	No
Pollution degree	2



## STANDARDS

### EMC:

- **IEC 61000-6-2:** EMC - Immunity standard for industrial environments
- **IEC 61000-6-4:** EMC - Emission standard for industrial environments
- **IEC 50121-4:** Railway applications - EMC - Emission and immunity of the signalling and telecommunications apparatus

### Safety:

- **IEC 60950-1:** Safety requirements for Information technology equipment
- **IEC 61010-1:** Safety requirements for electrical equipment for measurement, control, and laboratory use

### Environmental:

- **IEC 60068-2-1:** Environmental testing - Cold
- **IEC 60068-2-2:** Environmental testing - Dry heat
- **IEC 60068-2-30:** Environmental testing - Damp heat, cyclic (12 h + 12 h cycle)
- **IEC 60068-2-78:** Environmental testing - Damp heat, steady state
- **IEC 60068-2-6:** Environmental testing - Vibration (sinusoidal)
- **IEC 60068-2-27:** Environmental testing – Shock


## MODULE LED STATUS

A dual color (red/yellow) LED is provided on the module to indicate the module status. Yellow indicates the module mode / state and red indicates module error or warnings (according to the table below):

Status	Yellow	Red
Normal operating	ON	OFF
Communication timeout	Blinking	OFF
Module is not configured / wrong configuration	Single flashing	OFF
Module is configured but is in stopped mode (ready for being started)	Double flashing	OFF
Module is in firmware update mode	Quadruple flashing	OFF
Communication error	N/A	Blinking
Communication warning	N/A	Single flashing
Corrupted module info in EEPROM	N/A	Flickering
Hardware fatal error	OFF	ON
No module power	OFF	OFF

Each pattern / color will operate in 2 sec duty cycles. When the red LED is inactive (off), only the 2 sec yellow duty cycle will operate (yellow is always active). When the red LED is active, a switch between 2 sec yellow, and 2 sec red patterns will occur.

## SAFETY PRECAUTIONS

- Follow the national safety regulation (IEC 61010-1) 
- Only skilled person is allowed to install and operate the modules.
- Modules can only be mounted in an end-use enclosure which provides protection against fire, electrical and mechanical hazards.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.