

CT-3844 4 channels Analog Input, Thermocouple (TC-J/K/E/T/S/R/B/N) Types (filter adjustable)

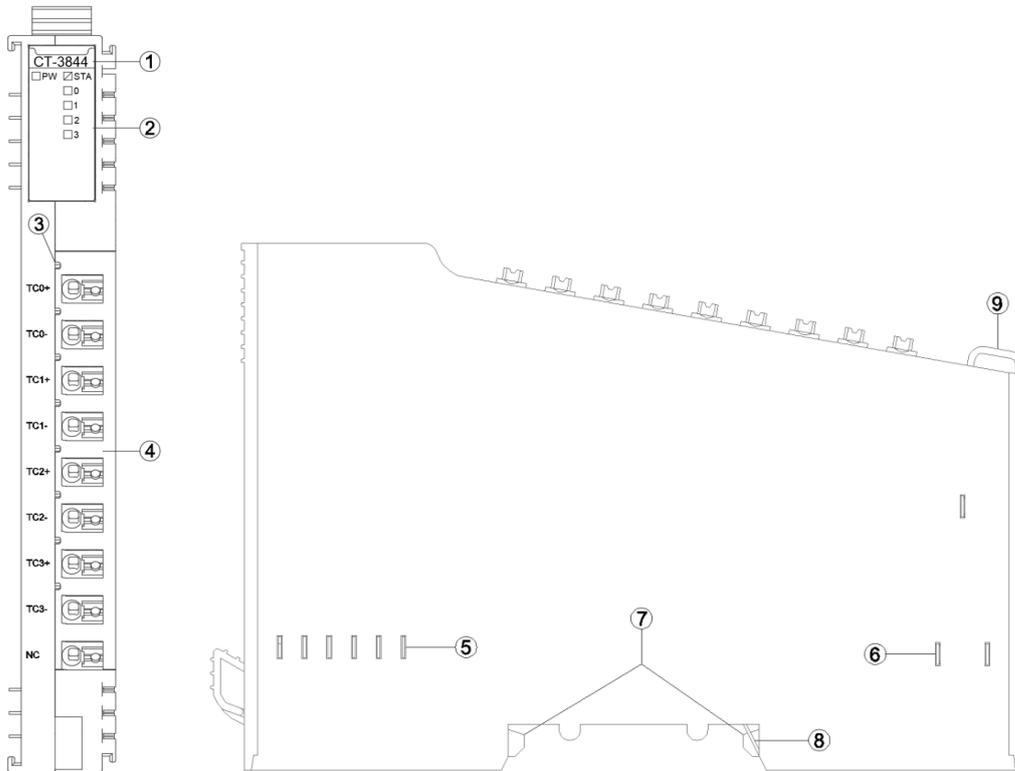
1 Module features

- ◆ The module supports 4-channel thermocouple signal acquisition
- ◆ The module carries with 4 analog LED indicators
- ◆ The module supports 9 kinds of conventional thermocouple temperature measurement type
- ◆ The internal bus of the module and field input adopts magnetic isolation
- ◆ The module input channel supports TVS overvoltage protection
- ◆ 24-bit ADC resolution (Σ - δ type)
- ◆ The module supports adjustable filter parameters

2 Technical Parameters

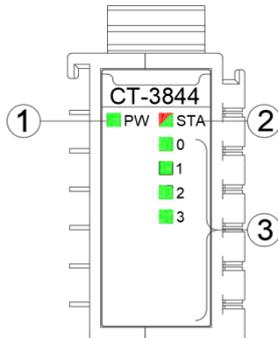
General parameters		
Power	Max.50mA@5.0Vdc	
Isolation	I/O to internal bus: magnetic isolation (2.5KVrms)	
Field Power	Not used	
Wiring	Max.1.0mm ² (AWG 17)	
Mounting Type	35mmDIN-Rail	
Size	115*14*75mm	
Weight	65g	
Environment Specification		
Operational Temperature	-40~70°C	
Operational Humidity	5%~95% RH (No Condensation)	
Ingress Protection Rating	IP20	
Input Parameter		
Channel Number	4 Channels	
LED Indicator	4 Input LED Indicators	
Sensor Type	J / K / E / T / S / R / B / N type thermocouples	
Acquisition Accuracy	±0.3% Full Scale, @25°C ±0.5% Full Scale, @-40~70°C	
Sampling Rate	70ms/4 channels	
Filter class	Adjustable	
Measuring Range °C	J Type	-210~1200°C
	K Type	-270~1370°C
	E Type	-270~1000°C
	T Type	-270~400°C
	S Type	-50~1760°C
	R Type	-50~1760°C
	B Type	0~1820°C
	N Type	-270~1300°C
Data Format	16-Bit Signed Integer (Integer)	
Diagnostic Function	-32767: No thermocouple model selected (that is, the channel is disabled) 32766: open circuit disconnection 32767: Temperature overflow -32768: Temperature underflow 32765: The ADC chip fault 32764: Cold-junction compensation transform fault value	

3 Hardware Interface



- ① Module Type
- ② State indicator
- ③ N/A
- ④ Wiring Terminal and identification
- ⑤ Internal Bus
- ⑥ Field Power
- ⑦ Buckle
- ⑧ Grounding Spring Sheet
- ⑨ Fixed Wiring Harness

3.1 LED LED indicator definition



- ① Power LED indicator (green)
- ② Module State LED indicator (red/green)
- ③ Output channel LED indicator (green)

PW POWER STATE (GREEN)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA MODULE STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-3 Channel Indicator	Definition
ON	The input signal exceeds 1% of the range
OFF	Invalid output signal

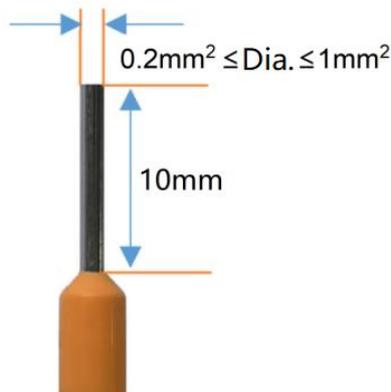
3.2 Terminal definition

Terminal Number	Definition	Description
1	TC0+	Signal Input CH0
2	TC0-	
3	TC1+	Signal Input CH1
4	TC1-	
5	TC2+	Signal Input CH2
6	TC2-	
7	TC3+	Signal Input CH3
8	TC3-	
9	NC	Not Connected

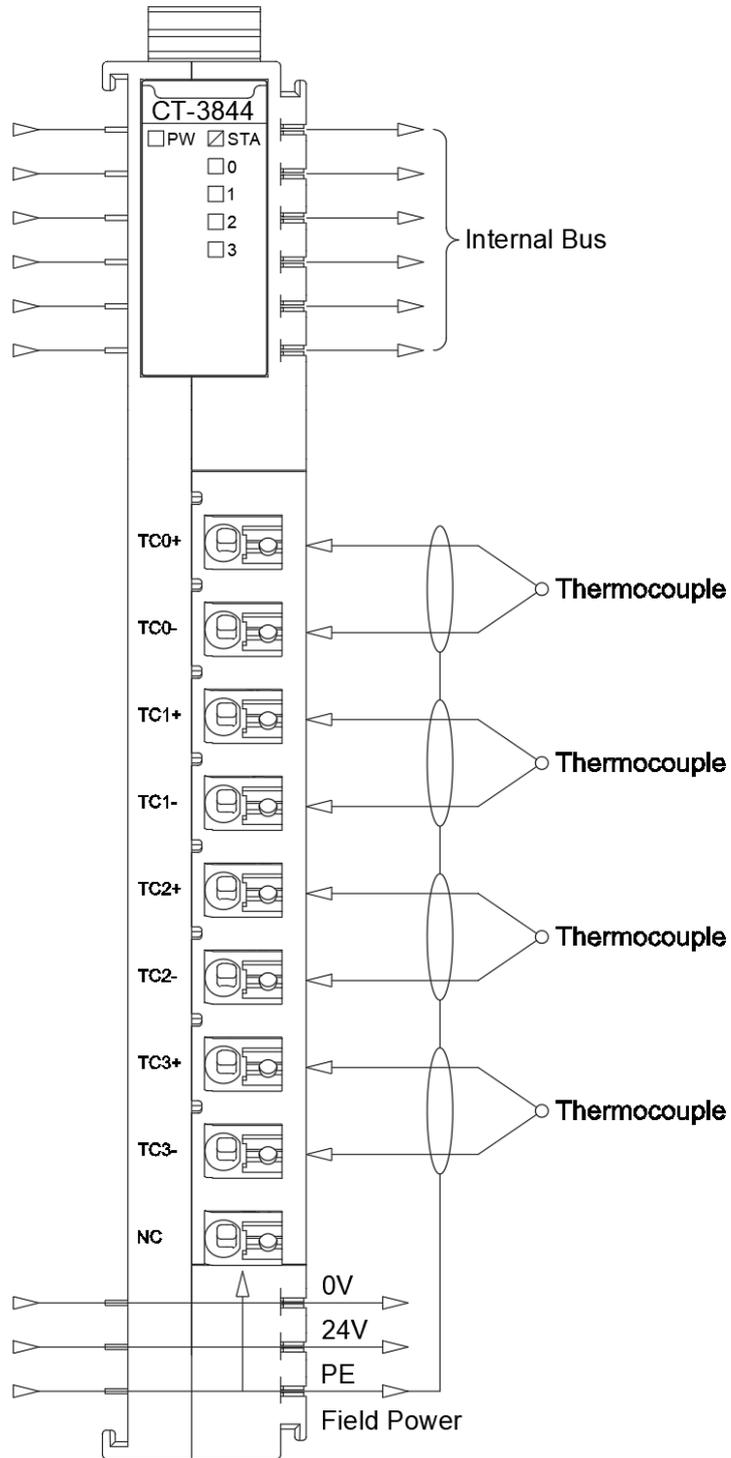
It is recommended to use cables with cores greater than 0.2mm² and smaller than 1mm².

When connecting cables (terminals)with cores, need to check and connect them according to the corresponding node serial number.

The cold-pressed terminal parameters are as follows:



4 Wiring



5 Process data definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								

Data description:

Analog Input Data (CH0-3): The current temperature acquisition value of the corresponding channel

Process Data Definition - J Type			
Temperature	Decimal	Hex	Location
>1360.0	32767	7FFF	Overflow
1360.0	13600	3520	Exceeds the upper limit
.	.	.	
.	.	.	
1200.1	12001	2EE1	
1200.0	12000	2EE0	Rated range
.	.	.	
.	.	.	
-210.0	-2100	F7CC	
<-210.0	-32768	8000	Underflow

Process Data Definition - K Type			
Temperature	Decimal	Hex	Location
>1622.0	32767	7FFF	Overflow
1622.0	16220	3F5C	Exceeds the upper limit
.	.	.	
.	.	.	
1372.1	13721	3599	
1372.0	13720	3598	Rated range
.	.	.	

.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	

Process Data Definition – E Type			
Temperature	Decimal	Hex	Location
>1200.0	32767	7FFF	Overflow
1200.0	12000	2EE0	Exceeds the upper limit
.	.	.	
.	.	.	
1000.1	10001	2711	Rated range
1000.0	10000	2710	
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	Underflow

Process Data Definition – T Type			
Temperature	Decimal	Hex	Location
>500.0	32767	7FFF	Overflow
500	5000	1388	Exceeds the upper limit
.	.	.	
.	.	.	
400.1	4001	FA1	Rated range
400.0	4000	FA0	
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	Underflow

Process Data Definition – S Type			
Temperature	Decimal	Hex	Location
>1800.0	32767	7FFF	Overflow
1800	18000	4650	Exceeds the upper limit
.	.	.	
.	.	.	

1760.1	17601	44C1	Rated range
1760.0	17600	44C0	
.	.	.	
.	.	.	
-50.0	-500	FE0C	
-50.1	-501	FE0B	Exceeds the lower limit
.	.	.	
.	.	.	
-110	-1100	FBB4	Underflow
<-110.0	-32768	8000	

Process Data Definition – R Type			
Temperature	Decimal	Hex	Location
>1940.0	32767	7FFF	Overflow
1940	19400	4BC8	Exceeds the upper limit
.	.	.	
.	.	.	
1760.1	17601	44C1	Rated range
1760.0	17600	44C0	
.	.	.	
.	.	.	
-50.0	-500	FE0C	
-50.1	-501	FE0B	Exceeds the lower limit
.	.	.	
.	.	.	
-110	-1100	FBB4	Underflow
<-110.0	-32768	8000	

Process Data Definition – B Type			
Temperature	Decimal	Hex	Location
>2070.0	32767	7FFF	Overflow
2070.0	20700	50DC	Exceeds the upper limit
.	.	.	
.	.	.	
1820.1	18201	4719	Rated range
1820.0	18200	4718	

.	.	.	
.	.	.	
100	1000	03C8	
<100.0	-32768	8000	Underflow

Process Data Definition – N Type			
Temperature	Decimal	Hex	Location
>1550.0	32767	7FFF	Overflow
1550.0	15500	3C8C	Exceeds the upper limit
.	.	.	
.	.	.	
1300.1	13001	32C9	
1300.0	13000	32C8	Rated range
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	Underflow

6 Configuration parameters definition

Configuration Parameter									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	Reserved					Temperature Unit		16Bit Data Format	
Byte 1	CJC Model (CH 3)		CJC Model (CH 2)		CJC Model (CH 1)		CJC Model (CH 0)		
Byte 2	TC Input Type (CH 1)				TC Input Type (CH 0)				
Byte 3	TC Input Type (CH 3)				TC Input Type (CH 2)				
Byte 4	Filtering Level (CH 1)				Filtering Level (CH 0)				
Byte 5	Filtering Level (CH 3)				Filtering Level (CH 2)				

Data description:

16Bit Data Format: Big-endian and little-endian format of data upload

0: A_B

1: B_A

Temperature Unit: (Default: 0)

0: Degrees Celsius°C

1: Fahrenheit°F

2: Kelvin (K-)

CJC Model(CH 0-3): cold junction compensation mode (Default: 0)

0: Internal reference junction

1: Fixed reference temperature. 0°C

TC Input Type(CH 0-3): Sensor type of the channel (Default: 0: N/A)

0: N/A

1: J type

2: K type

3: E type

4: T type

5: S type

6: R type

7: B type

8: N type

Filtering Level Ch (0-3): Filter level (Default: 4)

0: Level 0

1: Level 1

2: Level 2

3: Level 3

4: Level 4

5: Level 5

6: Level 6

7: Level 7

8: Level 8

9: Level 9

10: Level 10

11: Level 11

12: Level 12

A Dimension drawing

