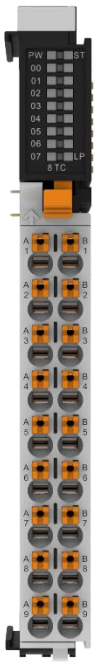
3.11 8 channel thermocouple measurement (DF50-M-8TC)

- The module adopts 8-channel thermocouple measurement and supports K/E/T/J/B/S/R/N/L models.
- Support eight sensors.
- Support 2-wire sensors.
- This module reserves eight cold end compensation output channels to compensate for temperature differences at the cold end.
- Two LED indicators indicate that the module is operating normally and communication is normal.
- Each channel is equipped with LED indicator lights.
- Magnetic isolation between the on-site layer and the system layer.
- Transmit in 16 resolution format.
- Protection level IP20.



3.11.1 Specification parameters

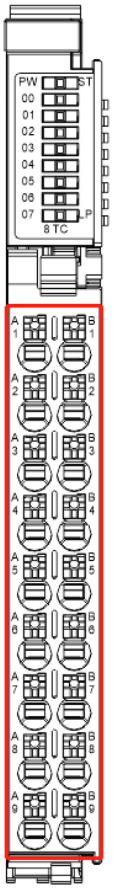
Technical Information

Product Description	Thermocouple measurement module, 16 bit resolution, 8 channels
Number of channels	8
Signal type	E. J, T, K, B, S, R, N, L
Sensor type	thermocouple
Cold end compensation	Internal and external (internal accuracy ≤ 3K)
temperature coefficient	≤ 50ppm/K
Module diagnosis	yes
Enter Connection Type	2-wire system
resolving power	16 Bit, 0.1 ℃/per digit
accuracy	± 0.3%
data size	16 Byte
Temperature erro	± 0.5%
measuring range	-270 ℃~1370 ℃
Supply voltage (system)	5VDC; Through data contacts
Power consumption	<100mA
working voltage	24VDC (-15%~+20%) across contact points through power supply
quarantine	500V system/on-site magnetic isolation
Frequency interference suppression	10Hz | 50Hz | 60Hz | 400Hz
Conversion time	125ms
Error diagnosis, reverse circuit protection	Yes
diagnosis	Broken line/parameter assignment error
Process alarm	Upper/lower limit of each channel
Wiring parameters	
Connection technology: input end	PUSH-IN type wiring port
line type	Input
Crimping area of wire	0.14～1.5mm²/26～16AWG
Strip length	8～10mm
Installation method	DIN-35 type guide rail
Material parameters	
Colour	Black
Housing material	PC plastic,PA66
Consistency flag	CE
Environmental requirements	
Permissible ambient temperature (during operation)	-25～60℃
Permissible ambient temperature(storage)	-40～85℃
Protection type	IP20
Pollution leve	2.Comply with IEC 61131-2 standard
Working altitude	Without temperature influence:0～2000m
Relative humidity (non condensing)	5～95%RH
Anti vibration	4g, Complies with IEC 60068-2-6 standard
Impact resistance	15g,Complies with IEC 60068-2-27 standard
EMC - Immunity	Complies with EN 61000-6-2 standard
EMC-Radiated Interference	Complies with EN 61000-6-3 standard
Corrosion resistance	Complies with IEC 60068-2-42 and IEC 60068-2-43 standards

Permissible H2S pollutant concentration at 75% relative humidity	10ppm
Permissible SO2 pollutant concentration at 75% relative humidity	25ppm

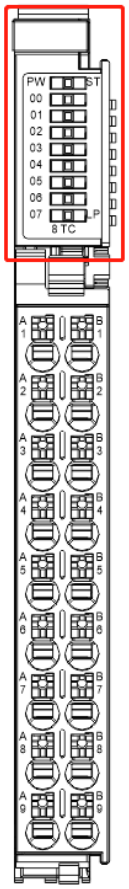
3.11.2 Hardware interface

3.11.2.1 Definition of wiring port



Serial Number	Signal	Serial Number	Signal	Explanatory note
A1	TC0+	B1	TC0-	Signal input channel 0
A2	TC1+	B2	TC1-	Signal input channel 1
A3	TC2+	B3	TC2-	Signal input channel 2
A4	TC3+	B4	TC3-	Signal input channel 3
A5	TC4+	B5	TC4-	Signal input channel 4
A6	TC5+	B6	TC5-	Signal input channel 5
A7	TC6+	B7	TC6-	Signal input channel 6
A8	TC7+	B8	TC7-	Signal input channel 7
A9	/	B9	/	/

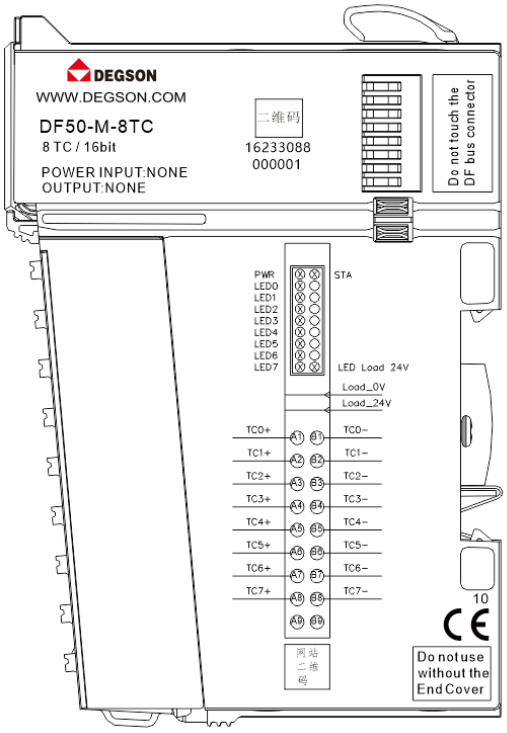
3.11.2.2 Definition of LED indicator lights

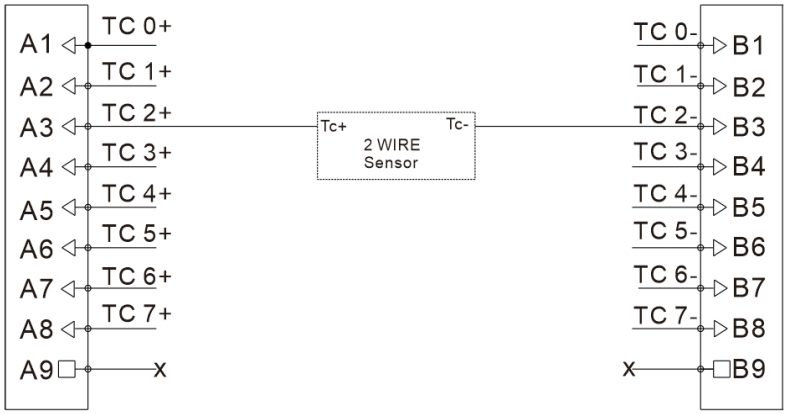


LED indicator light	Explanatory note
00~07	On: The analog signal output is valid
	Off: Invalid analog signal output
PW	On: Internal bus power supply is normal
	Off: Abnormal internal bus power supply
ST	Power on stage: green light on: module initialization abnormal, green light off: module initialization normal
	Operation phase: green light flashing: module internal bus working normally, green light off: module internal bus working abnormally
EP	On: The power supply to the external interface of the module is normal
	Off: Abnormal power supply to the external interface of the module

3.11.2.3 Wiring diagram

3.11.3 Mechanical Installation





data in									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	数据类型
Byte 0	Analog Input Data(Channel 0)								Int16
Byte 1									
Byte 2	Analog Input Data(Channel 1)								Int16
Byte 3									
Byte 4	Analog Input Data(Channel 2)								Int16
Byte 5									
Byte 6	Analog Input Data(Channel 3)								Int16
Byte 7									
Byte 8	Analog Input Data(Channel 4)								Int16
Byte 9									
Byte 10	Analog Input Data(Channel 5)								Int16
Byte 11									
Byte 12	Analog Input Data(Channel 6)								Int16
Byte 13									
Byte 14	Analog Input Data(Channel 7)								Int16
Byte 15									

Data description:

8-channel thermocouple measurement module

Analog Input Data(Channel 1~8): The analog signal input value of the corresponding channel.

Analog Input Data (DF20-M-4TC-KETJ) —E		
(℃)	decimalism	
>1010	32767	Exceeding the upper limit
1010	10100	Overflow range
1000 … … -270	10000 … … -2700	Rated range
-280	-2800	Underflow range
<-280	-32767	Underflow
Line break	-32768	Broken wire
Analog Input Data (DF20-M-4TC-KETJ) —J 型		
温度(℃)	十进制	
>1210	32767	Exceeding the upper limit
1210	12100	Overflow range
1200 … … -210	12000 … … -2100	Rated range
-220	-2200	Underflow range
<-220	-32767	Underflow
Line break	-32768	Broken wire
Analog Input Data (DF20-M-4TC-KETJ) —T 型		
温度(℃)	十进制	
>410	32767	Exceeding the upper limit
410	4100	Overflow range
400 … … -270	4000 … … -2700	Rated range
-280	-2800	Underflow range
<-280	-32767	Underflow
Line break	-32768	Broken wire
Analog Input Data (DF20-M-4TC-KETJ) —K 型		
温度(℃)	十进制	
>1380	32767	Exceeding the upper limit
1380	13800	Overflow range
1370 … … -270	13700 … … -2700	Rated range
-280	-2800	Underflow range
<-280	-32767	Underflow
Line break	-32768	Broken wire

Analog Input Data (DF20-M-4TC-KETJ) B 型		
温度(℃)	十进制	
>1830	32767	Exceeding the upper limit
1830	18300	Overflow range
1820 … … 50	18200 … … 500	Rated range
40	400	Underflow range
<40	-32767	Underflow
Line break	-32768	Broken wire
Analog Input Data (DF20-M-4TC-KETJ) S 型		
温度(℃)	十进制	
>1770	32767	Exceeding the upper limit
1770	17700	Overflow range
1760 … … -50	17600 … … -500	Rated range
-60	-600	Underflow range
<-60	-32767	Underflow
Line break	-32768	Broken wire
Analog Input Data (DF20-M-4TC-KETJ) R 型		
温度(℃)	十进制	
>1780	32767	Exceeding the upper limit
1780	17800	Overflow range
1770 … … -50	17700 … … -500	Rated range
-60	-600	Underflow range
<-60	-32767	Underflow
Line break	-32768	Broken wire
Analog Input Data (DF20-M-4TC-KETJ) N 型		
温度(℃)	十进制	
>2330	32767	Exceeding the upper limit
2330	17800	Overflow range
2320 … … 0	17700 … … 0	Rated range
-10	-100	Underflow range
<-10	-32767	Underflow
Line break	-32768	Broken wire
Analog Input Data (DF20-M-4TC-KETJ) L 型		
温度(℃)	十进制	
>910	32767	Exceeding the upper limit
910	9100	Overflow range

900 … … -200	9000 … … -2000	Rated range
-210	-2100	Underflow range
<-210	-32767	Underflow
Line break	-32768	Broken wire

3.11.4 Mechanical Installation

Installation dimensions

The installation size information is shown in the following figure.