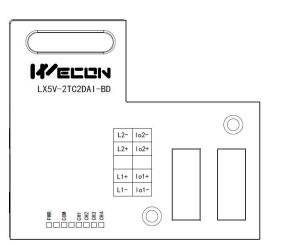


# LX5V-2TC2DAI-BD BD Module Manual

## **1** Installation

- Before installation, it must be ensured that the PLC host and the related device of the BD module terminal wiring are powered off reliably. The shell is inserted into the BD module slot of PLC host, and then locked with two standard screws for fixation.
- Two standard terminal heads are equipped with this BD module. After connecting the wiring, insert them into its terminal. After confirming that the host, BD module, wiring, etc. are installed correctly, it can be powered on for use.
- Solution Note:
  - When DAI current is output, ensure that the external load resistance is less than 500Ω. If the external load resistance is greater than  $500\Omega$ , the output current will be lower than normal value.
  - Please install the BD module firmly and fix it on PLC. Poor contact may lead to failure.
  - Tightening torque for fixing BD module or PLC top cover is 0.3N.m to0.6N.m. Please tighten it firmly to avoid malfunction.
  - You can only use a LX5V-2TC2DAI-BD on the PLC main unit of LX5 series.
- Warning: Cut off the power before installing, removing or wiring the BD module to avoid electric shock or product damage.

## 2 Appearance and terminal



TC part	OUT_2DAI par
ensor: 2-wire	Current output range

Table1 Terminal distribution

I	N_2TC part	O	JT_2DAI part
Applicat	ion sensor: 2-wire	Current	output range: 4mA
type K/J	thermocouple		to 20mA
	Channel 2 sensor		Channel 2
L2-	signal input	lo2-	sensor signal
	negative		output negative
	Channel 2 sensor		Channel 2
L2+	signal input	lo2+	sensor signal
	positive		output positive
	NC		NC
	Channel 1 sensor		Channel 1
L1+	signal input	lo1+	sensor signal
	positive		output positive
	Channel 1 sensor		Channel 1
L1-	signal input	lo1-	sensor signal
	negative		output negative

Table2 LED lamp function description

Indicator lamp	Description
PWR	ON when power-on (when the program is running, it will be ON).
СОМ	It flashes when communicating with PLC normally, and it is OFF when timeout.
CH1	Input channel 1 lamp: Always on in range; Flashing outside the range (type K: -100 $^{\circ}$ C to 1200 $^{\circ}$ C; type J: -100 $^{\circ}$ C to 600 $^{\circ}$ C); Off when the channel is closed.
CH2	Input channel 2 lamp: Always on in range; Flashing outside the range (type K: -100 $^{\circ}$ C to 1200 $^{\circ}$ C; type J: -100 $^{\circ}$ C to 600 $^{\circ}$ C); Off when the channel is closed.
СНЗ	Channel 3 lamp: Set the digital value Oto 2000 (4mA) to 20mA) to be always on; Flashes outside the digital value 0 to2000 (4mA to 20mA). When the channel is open, the light is on, and the current is output; When the channel is closed, the light is off, and the current is not output (approaching 0).

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CH4	Channel 4 lamp: Set the digital value 0to 2000 (4mA) to 20mA) to be always on; Flashes outside the digital value 0 to 2000 (4mA to 20mA). When the channel is open, the light is on, and the current is output; When the channel is closed, the light is off, and the current is not output (approaching 0).	



## **3** Specification

- (1) General specification: Same as PLC main unit. (Please refer to the accompanying manual of the PLC main unit.)
- (2) Power supply specification: The power supply is provided internally by PLC.
- (3) Performance specifications:

Project	Des	scription
Power supply	24VDC±10%, 50mA; 5VDC±10%, 70mA (The	power supply is provided internally by host)
	TC Part	
Input signal	Thermocouple: Type K or J (both types can b	be used per channel)
Rated range	Туре К: -100°С to 1200°С	Type J: -100℃ to 600℃
Digital output	Туре К: -1000 to 12000	Type J: -1000 to 6000
Digital Output	12-bit conversion, stored in 16-bit complement	ent
Over range display	32767	
Measurement accuracy	Туре К: 0.4°С	Туре Ј: 0.3 ℃
Total accuracy	$\pm$ (0.5% full range + 1°C) pure water co	ndensation point: $0^{\circ}C/32^{\circ}F$
Conversion speed	50ms*2 channels (channels that are not use	d are not converted)
Conversion features The readings given at the calibration reference point 0 °C (0), respectively. (Limited by overall accuracy)	(K type) +12000 (J type) +6000 -100 °C -1000	+600 C +1200C (J type) (K type) Temperature Input
	DAI section	
Rated range	0 to 2000: 4mA to 20mA	
Analog output range	DC 4mA to 20mA (external load resistance $\leq$	500 Ω)
Digital output	12-bit binary	
Resolution	8uA [4mA to20mA/2000]	
Comprehensive precision	±0.5% of full scale (4mA to 20mA: ±0.08 mA	
D/A conversion time	One scan cycle (D/A conversion after ladde channel output value is updated)	er diagram END instruction is executed, and BD
Output features	External load is 250Ω. 0 to 2000 was convert 20mA Analog output 4mA	gital input
Points occupied		dard maximum control points of the main PLC

Note: Grounded thermocouples are not suitable for use with this unit!



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## 4 Wiring



Cut off the power before installing, removing or wiring the BD module to avoid electric shock or product damage.

#### Note:

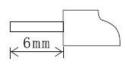
- Do not place signal cables near high voltage power cables or in the same trunk line. Otherwise, it may be disturbed or surged. Keep a safe distance between signal cable and power cable, at least 100mm.
- Ground the shielding of shielded wire or shielded cable. But the ground point and high voltage line cannot be the same.
- Do not connect cables of impermissible size to avoid poor contact or product damage.
- Fix the cable so that no force directly acts on the terminal line or cable connection area.
- The tightening torque of terminal is 0.5Nm to 0.6N.m. Please tighten it to prevent malfunction.
- Do not use empty terminals.

#### 4.1 Applicable cables

- (1) AWG25-16 is used for connection with output device.
- (2) Maximum terminal tightening torque is 0.5N.m to 0.6N.m.
- (3) Using different types of cables may cause poor contact with terminals. Please use pressfit terminals for good contact.

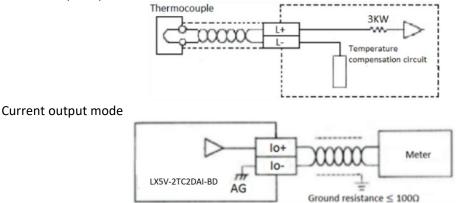
#### Line number and cross-sectional area

Line number	Cross-sectional area (mm²)	End processing
AWG26	0.1288	Stranded cable: Strip off the sheath, rub the core wire,
		and then connect the cable.
AWG16	1.309	Single-core cable: Strip off the sheath and connect the cable.



## 4.2 I/O Mode

Thermocouple input mode





## **5** Description of PLC device

- (1) When connected to LX3 series PLC, please refer to LX3 series BD module manual.
- (2) When connected to LX5 series PLC, if the firmware version of PLC is lower than 2.051 (excluding 2.051), or BD module is not configured by host computer, it can be controlled by the following system devices: Table3Device allocation

PLC model	BD model	Device	Descriptio	on	Device	Description
		SM2010	CH1 thermocouple switch flag	OFF: Type K thermocouple	SD2010	The temperature of CH1 at 0.1°C (Type K: -100°C to 1200°C: -1000 to 12000; Type J: -100°C to 600°C: -1000 to 6000)
LX5V	2TC2DAI	SM2011	CH2 thermocouple switch flag	ON: Type J thermocouple	SD2011	The temperature of CH2 at 0.1°C (Type K: -100°C to 1200°C: -1000 to 12000; Type J: -100°C to 600°C: -1000 to 6000)
		SM2012	CH3 current output channel open flag	OFF: Open	SD2012	CH3 digital value (0 to 2000: 4mA to 20mA)
		SM2013	CH4 current output channel open flag	ON: Close	SD2013	CH4 digital value (0 to 2000: 4mA to 20mA)

(3) You can select device through I/O mapping to use the configuration function of new BD module. For details, please refer to "<u>6.1 Parameter configuration</u>".

## 6 Instructions

### 6.1 Parameter configuration

- (1) Open the host computer software and create a new project, double-click "Project Manager"  $\rightarrow$  "Extended Function"  $\rightarrow$  "BD Module Configuration" Note to enter "BD settings" interface;
- (2) Configure the currently connected PLC (take the LX5V-2416 model as an example) and BD module model on the BD module configuration interface: Select "LX5V-2TC2DAI" in the device bar on the right side of the BD module configuration interface and double-click to add it to the corresponding slot position of PLC (slot number 1 or 2, the software will select slot 1 by default, and right-click to move down to slot 2);
- (3) After adding the BD module to the slot, double-click or right-click to select configuration parameters to enter LX5V-2TC2DAI-BD configuration parameters interface, as shown in the following figure. Configure related parameters on this interface.

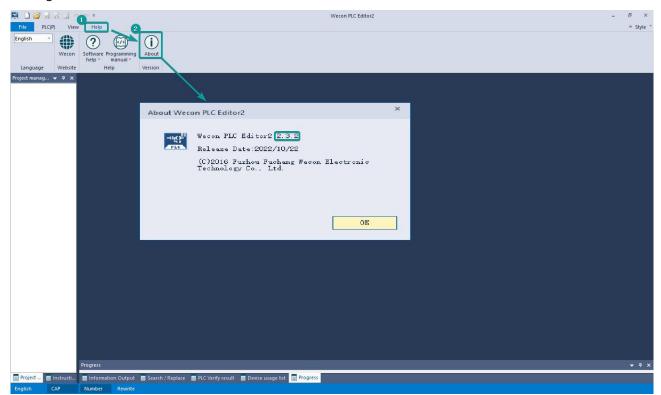


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											- LX5V-4ADV - LX5V-8BX	
											- LX5V-88YT - LX5V-2R5485	
											LX5V-ETH	
								Reset	ок с	ancel		
	Prog											

Note: This function is only supported in the following versions of host computer, slave computer and BD module:



(1) Supported host computer versions: Wecon PLC Editor2 2.1.204 and above, as shown in the following figure:



(2) Supported slave computer versions: 2.051 and above, as shown in the following figure:

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(3) Supported BD module version number: 1013 and above, as shown in the following figure:

Slot num	Configure device	Device description	Device occupation	Actual installatio	Device version n
	LX5V-2416	LX5V-2416	X0~X27;Y0~Y17	LX5V-2416MT	V2.061
1	LX5V-2TC2DAI	2-channel temperature module; 2-channel digital-to-analog conversion module DA, supporting current output	R0;R1;R2;R3;	LX5V-2TC2DAI	1014
2					



#### The parameter configuration interface is as below:

1. Module setting: Set response time (The response time is the interval time between PLC acquisition of BD module data. Range: 0.1ms to 3276.7ms).

figuration LX5V-2TC2DAI					
Module configuration	TCConfiguration	DAIConfiguration	I/O mapping	Device Info	
Response time (0.1ms	) 10	1~32767			
$\square$					

#### 2、TC configuration:

Image: Chable channel   Sensor type   K   Filtering intensity   Chable overnun detection   Upper temperature limit   12100   -1100 <sup>-1</sup> 12100   ().1'C)   Lower temperature limit   1100   -1100 <sup>-1</sup> 2100   ().1'C)   Enable temperature calibration   Temperature gain   1.000000   -10000.0 <sup>-1</sup> 10000.0   Temperature offset   0.000000   -10000.0 <sup>-1</sup> 10000.0	Channel-1	Configuration DAIConfigu	uration I/C	Omapping Device Info		
Filtering intensity       4       •         Filtering intensity       4       •         Enable overnun detection       Enable overnun detection       Enable overnun detection         Upper temperature limit       12100       -1100~12100       Upper temperature limit       12100       -1100~12100         (0,1°C)       Lower temperature limit       -1100       -1100~12100       (0,1°C)       Lower temperature limit       -1100~12100         IC Finable temperature calibration       -1100       -1100~1000.0°       -10000.0°       -10000.0°         Temperature gain       1.000000       -10000.0°       Temperature gain       1.000000       -10000.0°	Enable channel			Enable channel		
Enable overrun detection          Enable overrun detection          Upper temperature limit (0.1°C)           -1100~12100           Upper temperature limit (0.1°C)          -1100 -1100~12100         (0.1°C)         Lower temperature limit (0.1°C)          -1100 -1100~12100         (0.1°C)          -1100 -1100~12100         (0.1°C)         Enable temperature calibration          -1100 -11000.0~10000.0           -1100 -1100~12100         (0.1°C)         Enable temperature calibration          Temperature gain          1.000000 -10000.0           Temperature gain         1.000000 -10000.0	Sensor type	κ	*	Sensor type	к	*
Upper temperature limit (0.1°C)         12100         -1100~12100         Upper temperature limit (0.1°C)         12100         -1100~12100           Lower temperature limit (0.1°C)         -1100         -1100~12100         -1100~12100         -1100~12100           Dependence         -1100         -1100~12100         -1100~12100         -1100~12100           Dependence         -1100         -1100~10~1000.0         -1100~1000.0           Temperature gain         1.000000         -10000.0~10000.0         -10000.0~10000.0	Filtering intensity	4	*	Filtering intensity	4	*
(0.1°C)         -1100         -1100~12100         (0.1°C)           Lower temperature limit         -1100~12100         -1100~12100         -1100~12100           (0.1°C)         Lower temperature limit         -1100~12100         -1100~12100           (0.1°C)         Lower temperature limit         -1100~12100         -1100~12100           Temperature gain         1.000000         -10000.0~10000.0         Temperature gain         1.000000	Enable overrun detect	tion		Enable overrun detect	tion	
Lower temperature limit         -1100         -1100~12100         Lower temperature limit         -1100         -1100~12100           (1 1 °C)         □ Enable temperature calibration         □ Enable temperature calibration         □ Enable temperature calibration         □ Enable temperature gain         1.000000         -10000.0~10000.0		12100 -1100~12100			12100	-1100~12100
Enable temperature calibration       Enable temperature calibration         Temperature gain       1.000000         -10000.0~10000.0       Temperature gain	Lower temperature limit	-1100 -1100~12100		Lower temperature limit	-1100	-1100~12100
		alibration			alibration	1
Temperature offset         0.000000         -10000.0~10000.0	Temperature gain	1.000000 -10000.0~1000	0.0	Temperature gain	1.000000	-10000.0~10000.0
	Temperature offset	0.000000 -10000.0~1000	0.0	Temperature offset	0.000000	-10000.0~10000.0

- ① Check enable channel to set whether to enable the current BD module channel.
- ② Sensor type: The default sensor type is K thermocouple (Type K and J are optional, and you can set through the drop-down box).
- ③ Setting the filtering intensity can reduce the jitter of BD channel value. The default configuration of filter intensity is 4. Level 0 is the lowest and level 9 is the highest. The filter intensity can be adjusted according to actual use.
- (4) Check enable overrun detection to judge that when the upper and lower limits of temperature exceed the current setting temperature, the host computer will prompt an error.

Note: Different types of thermocouples can measure different temperature ranges.



(5) Check enable calibration, you could calculate the gain offset according to the following formula to convert the corresponding channel value:

Channel value = actual temperature value × gain value + offset value

When the channel value deviates from the actual temperature value, the channel can be calibrated by setting the gain offset, for example:

If the type of thermocouple connected to the current channel is K:

- The input temperature of control channel is 0°C, the value of acquisition channel is 50 (unit: 0.1°C), and the actual channel value should be 0 (unit: 0.1°C).
- The input temperature of control channel is 1100°C, the value of acquisition channel is 11100 (unit: 0.1°C), and the actual channel value should be 11000 (unit: 0.1°C)

$$\begin{cases} 0 = 50^* a + b \\ 11000 = 11100^* a + b \end{cases}$$

Suppose the gain is a, and the offset is b, then (11000 = 11100 + a + b)

 $\begin{cases} a=0.995475\\ b=-49.7738 \end{cases}$  The calibration can be completed by setting the corresponding gain

offset to the current channel.

3、DAI configuration:

Channel-3	TCConfiguration DAIConfiguration	I/O mapping Device Info	r
Enable channel		Enable channel	
Conversion mode	4mA~20mA(0~2000) *	Conversion mode	4mA~20mA(0~2000) *
Output status after st     Otear     Reserved     Default value	pping	Output status after ste	opping
Enable calibration		Enable calibration	
Gain	1.000000 -10000.0~10000.0	Gain	1.000000 -10000.0~10000.0
offset	0.000000 -10000.0~10000.0	offset	0.000000 -10000.0~10000.0
	ß		

- (1) Check enable channel to set whether to enable the current BD module channel.
- (2) The conversion mode is set to DAI conversion mode by default, and the measurement range is 4mA~20mA (0~2000).
- ③ Output state after stop: When PLC stops, the output state of BD module channel mainly includes the



### following three types:

Output clear: When PLC stops, the output current of BD module channel is 4mA

Output hold: When PLC stops, the channel output of the BD module maintains the digital current value set by the corresponding channel in the current I/O mapping device.

Output preset value: When PLC stops, BD module channel outputs preset digital value or preset analog quantity corresponding to the current value.

(4) Check enable calibration, you could calculate the gain offset according to the following formula to convert the corresponding channel value:

Channel input digital value = actual output current corresponds to digital value × gain value + offset value

- (5) When the channel value deviates, you could also set the gain offset to calibrate the channel. For example:
  - When the channel input digital value is 0, the multimeter measures the output current of BD module channel to be 5mA (corresponding digital value is 125).
  - When the channel input digital value is 2000, the multimeter measures the output current of BD module channel to be 5mA (corresponding digital value is 1875).

$$\begin{cases} 0 = 125 * a + b \\ 2000 = 1875 * a + b \end{cases}$$

Suppose the gain is a, and the offset is b, then  $\lfloor 2000 = 18/3 \cdot a + b \rfloor$ 

$$\int a = 1.142857$$

Solve and get b = -142.857 The calibration can be completed by setting the corresponding gain

offset to the current channel.



4、 Set I/O mapping. The channels are mapped to R device according to the current number of BD module channels by default. As shown in the following figure, BD module CH1 to CH4 is mapped to device R0 to R3.

ule configuration	TCConfiguration DAIConfi	guration I/O mapping Device Info	
hannel mapping elem	ient	Channel	
- R0		CH1	
– R1		CH2	
– R2		CH3	
- R3		CH4	

5. After the above configuration is completed, check the program, download the configuration to PLC, and STOP $\rightarrow$ RUN configuration takes effect.

🛤 🗋 🚰 🔜 🖼 🖆 🗠 ד	Wecon PLC Edit	or2 C:\Users\Administrator\Desktop\11	1.wcp2 - Extended Function I	BD Board Configuration	
File PLC(P) View Help					∧ Style *
Image: Second		Compile Edit model Switch Compile all Compile all Program Program Monitor Edit (W)	Transfer Settings	Device Monitor     OPLC clock setting     Module monitoring     Clear Device Memory     Online	Automatic backup
Project management 🛛 👻 🗛 🗙 Scannin	g MAIN Extended Function BD Board Conf	iguration ×			~
	afigure de   Device description Online operation  Read(h)  Paranthrogram(7)  Okasse UKSCPU/USSV  Okasse	a parameters + hi	Verity(c) Desalect # Upload Program Coment Calcu	parity superity /51228 steps	i / * Derie * FEC hest • FEC hest • LEXY-8084 • LEXY-8084 • LEXY-8084 • LEXY-8144 • LEXY-8144 • LEXY-1014 • LEXY-1014 • LEXY-1014 • LEXY-1014 • LEXY-1014 • LEXY-1014 • LEXY-1014 • LEXY-1014 • LEXY-2014 · LE
E Information Output	Search / Replace 📕 PLC Verify result 📕 Device	usage list 📃 Progress			
Project management					The second second
English CAP Number Rewrite	USB(4)HUB(5) LX5V 0/2				

## 6.2 Ladder Diagram

1. Programming example that does not use the host computer software "BD module configuration" function. For device allocation, please refer to "<u>5 PLC device description</u>".

[Write]	1	2	3	4	5	6	7	8	9	10	11	12	
/* * Open four	r channels of	BD board				<u>.</u>							
7	SM102												
0	The first cyc le after R.										-{RST	SM2010 BD1 the first way switch	Switch CH1 to type K thermocouple
		-									-{RST	SM2011 } BD1 the sec ond way s	Switch CH2 to type K thermocouple
		1									-{RST	SM2012 BD1 the thir d way swi	Turn on the CH3 current output channel
	,	-									-{ <mark>RST</mark>	SM2013 ] BD1 the fou	Turn on the CH4 current output channel
1-	or or an											rth way sw	
* Mapping o	channel valu	es to D0~D	3										
10	SM100 Always ON after RUN									{MOV	SD2010 BD1 the fir way value		Write the temperature value of CH1 to
										{MOV	SD2011 BD1 the se ond way v		Write the temperature value of CH2 to
		·								{MOV	D2 3rd channe value	SD2012 } el BD1 the thir d way value	Write the value in D2 to CH3
		0								MOV	D3 4th channe value	SD2013 ] el BD1 the fou th way va	Write the value in D3 to CH4

2. Programming example using "BD module configuration" function of host computer software:



Map CH1 into R0 device Map CH2 into R1 device Set the digital value in D2 to CH3 mapping Set the digital value in D3 to CH4 mapping



## 6.3 BD monitoring interface and buffer memory

Open the module monitoring interface, select BD module module, select LX5V-2TC2DAI from the list of BD modules on the right to monitor it online, and check the current BD module communication status and error information in time.

ing MAIN Extended Function Depension I BD board Ss Value N0 1 1 0	Data type Di:		toring 1 ×	Current module info.: LX5V-2TC2DAI(1)	Refresh	Customi
ss Value 10 1	Data type Di:			Current module info.: LX5V-2TC2DAI(1)	Refresh	Customi
10 1		:play format				
	Bute [uprigned]		Description	M	lodule info.	Solution Info.
1 0			annel 1 channel enable. 0: Channel off; 1: Channel on	1.3	5V-2TC2DAI	
	Byte [unsigned]		annel 1 sensor type. 0: K; 1: J			
4	Byte [unsigned]		annel 1 filter intensity			
32767	Word [Signed]	Decimal Char	annel 1 channel value, unit: 0.1°C			
2 2	Word [Unsigne	Decimal Char	nnel 1 status information. 0: Channel off; 1: Channel on; 2: Channel value is out of range			
1	Word [Unsigne	Decimal Char	innel 1 error code. 0: No error; 1: Channel value is out of range			
10 1	Byte [unsigned]	Decimal Char	unnel 2 channel enable. 0: Channel off; 1: Channel on			
0 0	Byte [unsigned]	Decimal Char	unnel 2 sensor type. 0: K; 1: J			
12 4	Byte [unsigned]	Decimal Char	unnel 2 filter intensity			
32767	Word [Signed]	Decimal Char	nnel 2 channel value, unit: 0.1°C			
2 2	Word [Unsigne	Decimal Char	nnel 2 status information. 0: Channel off; 1: Channel on; 2: Channel value is out of range			
14 1	Word [Unsigne	Decimal Char	nnel 2 error code. 0: No error; 1: Channel value is out of range			
10 1	Byte [unsigned]	Decimal Char	annel 3 Channel enable. 0: Channel off; 1: Channel on			
1 1	Byte [unsigned]	Decimal Char	innel 3 channel mode selection, 1: Current output Mode (4mA~20mA)			
0	Byte [unsigned]	Decimal Outs	put status after channel 3 stops, 0: Output cleared: 1: Output held, 2: Output default value			
04 0						
0 0						
12						
14 0						
10 1						
1 1						
13 0						
0						
	4 1 0 1 1 0 2 4 4 1 1 1 1 1 1 1 1 1 3 0 4 0 0 0 0 0 1 1 4 0 0 1 1 1 1 1 3 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	4         1         Word [Unsigned]           0         1         Byte [unsigned]           1         0         Byte [unsigned]           2         4         Byte [unsigned]           0         32787         Word [Signed]           1         1         Byte [unsigned]           2         2         Word [Unsigned]           3         0         Byte [unsigned]           1         1         Byte [unsigned]           2         1         Word [Unsigned]           3         0         Byte [unsigned]           4         0         Word [Unsigned]           2         1         Word [Unsigned]           3         0         Byte [unsigned]           4         0         Word [Unsigned]           3         0         Byte [unsigned]           4         0         Word [Unsigned]           4         0         Word [Unsigned]           2         1         Word [Unsigned]           4         0         Word [Unsigned]           0         3         Word [Unsigned]           2         1         Word [Unsigned]           4         0         Wor	4         1         Word [Unsigner]         Decimal         Cha           0         1         Byte [unsigner]         Decimal         Cha           1         0         Byte [unsigner]         Decimal         Cha           2         4         Byte [unsigner]         Decimal         Cha           0         12767         Word [Signer]         Decimal         Cha           2         2         Word [Unsigner.         Decimal         Cha           4         1         Word [Unsigner.         Decimal         Cha           3         0         Byte [unsigner]         Decimal         Cha           4         0         Word [Unsigner.         Decimal         Cha           0         1         Byte [unsigner]         Decimal         Cha           0         0         Word [Unsigner.         Decimal         Cha           0         1         Byte [unsigner]         Decimal         Cha           1         1         Byte [unsigner]         Decimal         Cha           2         1         Word [Unsigner.         Decimal         Cha           3         0         Byte [unsigner]         Decimal         Cha	4     1     Word [Unsigned]     Decimal     Channel 1 error code. 00 Ne error; 1: Channel wake is out of range       1     0     Byte [unsigned]     Decimal     Channel 2 downel earbits. Of Ne error; 1: Channel off: 1: Channel on       1     0     Byte [unsigned]     Decimal     Channel 2 downel earbits. Of Ne error; 1: Channel off: 1: Channel on       2     4     Byte [unsigned]     Decimal     Channel 2 downel 2 resors type. 0; N; 1: J       2     2     Word [Unsigned]     Decimal     Channel 2 downel 2 resors type. 0; N; 1: J       2     2     Word [Unsigned]     Decimal     Channel 2 downel 2 resors type. 0; N; 1: J       3     1     Byte [unsigned]     Decimal     Channel 2 downel 2 resors type. 0; N; 1: J       4     1     Word [Unsigned]     Decimal     Channel 3 channel innode selection; 1: Current output Mode (4nA-20nA)       3     0     Byte [unsigned]     Decimal     Channel 3 channel innode selection; 1: Current output Mode (4nA-20nA)       3     0     Byte [unsigned]     Decimal     Channel 3 channel innode selection; 1: Current output Mode (4nA-20nA)       4     0     Word [Unsigned]     Decimal     Channel 3 channel innode selection; 1: Current output Mode (4nA-20nA)       5     0     Byte [unsigned]     Decimal     Channel 3 channel innode selection; 1: Current output Mode (4nA-20nA)       6	4       1       Word [Undgen	4       1       Word [Undigne Decimal       Channel 1 error code 0. No error; 1: Channel value is cut of range         1       0       Byte [unsigned]       Decimal       Channel 2 exercity byte 0. Ky; 1: J         2       4       Byte [unsigned]       Decimal       Channel 2 exercity byte 0. Ky; 1: J         2       2       Word [Unsigne       Decimal       Channel 2 exercity byte 0. Ky; 1: J         2       2       Word [Unsigne       Decimal       Channel 2 exercity byte 0. Ky; 1: J         4       1       Word [Unsigne       Decimal       Channel 2 exercity byte 0. Ky; 1: J         4       1       Word [Unsigne       Decimal       Channel 2 exercity byte 0. Ky; 1: J         3       1       Byte [unsigned]       Decimal       Channel 3 Channel a exable. 0. Channel off; 1: Channel on; 2: Channel value is out of range         4       1       Word [Unsigne       Decimal       Channel 3 channel mode selection, 1: Carrent carge Mode (enA-20mA)       Decimal         3       0       Byte [unsigned]       Decimal       Channel 3 stops. C: Output Mode (enA-20mA)         4       0       Word [Unsigne       Decimal       Channel 3 stops. C: Output Mode (enA-20mA)         4       0       Word [Unsigne       Decimal       Channel 3 stops. C: Output Mode (enA-20mA

(1) TC buffer memory (BFM): used for BD module status monitoring.

BFM address	Power -off hold	Read- write	Memory name	Default	Range	Description
0x2000	×	R/W	Channel 1 channel enable	1	0 to 1	0: Channel closed; 1: Channel open
0x2001	×	R/W	Channel 1 sensor type	0	0 to 1	0: Type K thermocouple; 1: Type J thermocouple
0x2002	×	R/W	Channel 1 filter intensity	4	0 to 9	0: Minimum filter strength; 9: Maximum filter strength
0x2080	×	R	Channel 1 channel value	32767	-32768 to 32767	Unit: 0.1℃
0x2082	×	R	Channel 1 status information	1	0 to 2	0: Channel closed; 1: Channel opened 2: Channel value exceeds the range
0x2084	×	R	Channel 1 error code	0	0 to 1	0: No error; 1: Channel value exceeds the range
0x2100	×	R/W	Channel 2 channel enable	1	0 to 1	0: Channel closed; 1: Channel open
0x2101	×	R/W	Channel 2 Sensor Type	0	0 to 1	0: Type K thermocouple; 1: Type J thermocouple
0x2102	×	R/W	Channel 2 filter intensity	4	0 to 9	0: Minimum filter strength; 9: Maximum filter strength
0x2180	×	R	Channel 2 channel value	32767	-32768 to 32767	Unit: 0.1℃
0x2182	×	R	Channel 2 status information	1	0 to 2	0: Channel closed; 1: Channel opened 2: Channel value exceeds the range
0x2184	×	R	Channel 2 error code	0	0 to 1	0: No error; 1: Channel value exceeds the range

1) DAI buffer memory (BFM): used for BD module status monitoring.

BFM Power address hold	Read- write	Memory name	Default	Range	Description
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0x2200	×	R/W	Channel 3 channel enable	1	0 to 1	0: Channel closed; 1: Channel open
0x2201	×	R/W	Channel 3 channel mode selection	1	1	1: Current output mode (4mA to 20mA)
0x2203	×	R/W	Output status after channel 3 stops	0	0 to 2	0: Output cleared; 1: Output held; 2: Output preset value
0x2204	×	R/W	Channel 3 output preset value	0	-32768 to 32767	
0x2280	×	R	Channel 3 channel value	0	0 to 2000	Only supported in channel mapping device setting
0x2282	×	R	Channel 3 status information	1	0 to 2	0: Channel closed; 1: Channel opened 2: Channel value exceeds the range
0x2284	×	R	Channel 3 error code	0	0 to 1	0: No error; 1: Channel value exceeds the range
0x2300	×	R/W	Channel 4 channel enable	1	0 to 1	0: Channel closed; 1: Channel open
0x2301	×	R/W	Channel 4 channel mode selection	1	1	1: Current output mode (4mA to 20mA)
0x2303	×	R/W	Output status after channel 4 stops	0	0 to 2	0: Output cleared; 1: Output held; 2: Output preset value
0x2304	×	R/W	Channel 4 output preset value	0	-32768 to 32767	
0x2380	×	R	Channel 4 channel value	0	0 to 2000	Only supported in channel mapping device setting
0x2382	×	R	Channel 4 status information	1	0 to 2	0: Channel closed; 1: Channel opened 2: Channel value exceeds the range
0x2384	×	R	Channel 4 error code	0	0 to 1	0: No error; 1: Channel value exceeds the range

# (2) Universal buffer memory (BFM): used to diagnose the communication status of the currently connected BD module.

BFM address	Power -off hold	Read- write Functi on	Memory name	Default	Range	Description
0x200	×	R	Current maximum package length	0	0 to0xFFFF	The maximum length of the currently sent package
0x202	×	R	Number of retransmissions	0	0 to0xFFFF	Number of retransmissions
0x204	×	R	Number of retransmissions of subpackages	0	0 to0xFFFF	Number of retransmissions of subpackages
0x206	×	R	Received times of sync frames	0	0 to0xFFFF	Received times of sync frames
0x208	×	R	Sent times of sync frames	0	0 to0xFFFF	Sent times of sync frames
0x20A	×	R	Control the number of transmissions	0	0 to0xFFFF	Control the number of transmissions
0x20C	×	R	Control the number of receptions	0	0 to0xFFFF	Control the number of receptions
0x20E	×	R	Number of subscriptions sent	0	0 to0xFFFF	Number of subscriptions sent
0x210	×	R	Number of subscriptions received	0	0 to0xFFFF	Number of subscriptions received
0x212	v	R/W	Latest error code	0	Only 0 can be written.	Protocol internal error code, write 0 to clear
0x214	×	R	Number of bytes sent	0	0 to 0xFFFFFFFF	Number of bytes sent
0x218	×	R	Number of valid bytes sent	0	0 to 0xFFFFFFFF	Number of valid bytes sent
0x21C	×	R	Number of bytes received	0	0 to 0xFFFFFFFF	Number of bytes received

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0x220	×	R	Number of valid bytes received	0	0 to 0xFFFFFFFF	Number of valid bytes received
0x224	×	R	Communication time (unit s)	0	0 to 0xFFFFFFFF	Normal communication time since the BD module is powered on