

LX3V-2WT Extension Module

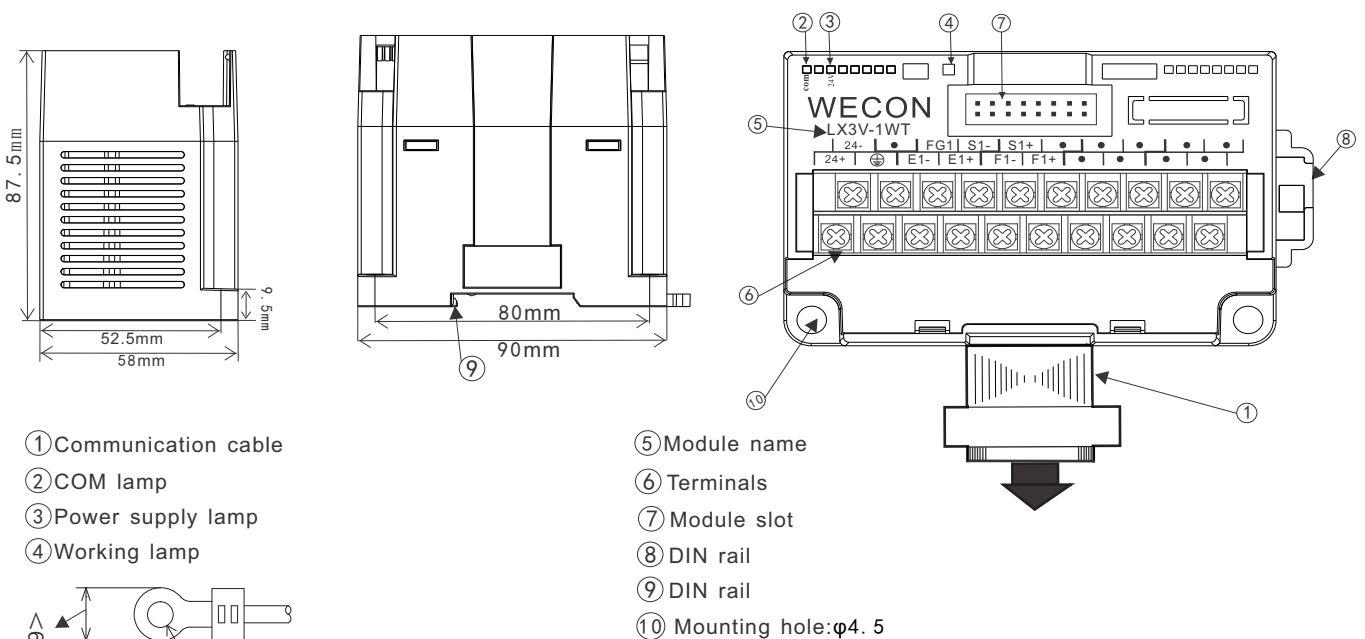
1. Introduction

- 1). Thank your for purchasing Wecon LX3V-WT series extension module. the maximum resolution is 24bit. Using 4 or 6 wires weighting sensor.
- 2). Please read this manual carefully before attempting to operate. this manual is only written for LX3V-WT.
- 3). Using FROM/TO command to read/write data by LX3X CPU unit.

2. Specification

Item	Description
Channel	Signal channel
A/D converter	24 bit $\Delta\Sigma$ A/D
Resolution	24bit (signed)
speed	7.5/10/25/50/60/150/300Hz available
polarity	Unipolar and bipolar
Non-linearity	$\leq 0.01\%$ full scale (25°C)
zero drift	$\leq 0.2\mu\text{V}/^\circ\text{C}$
Gain drift	$\leq 10\text{ppm}/^\circ\text{C}$
excitation current	5V, load impedance $\geq 200\Omega$
Sensor sensitivity	1mV/V-15mV/V
Isolation	Transformer (power supply) and the optical coupler (signal)
Lamp	Power supplamp,communication lamp
Power supply	24V $\pm 20\%$ 2VA
Operating temperature	0~60°C
Storage temperature	-20~80°C
Dimension	90(L)x58 (W) x80 (H) mm

3. Dimension



- ① Communication cable
- ② COM lamp
- ③ Power supply lamp
- ④ Working lamp

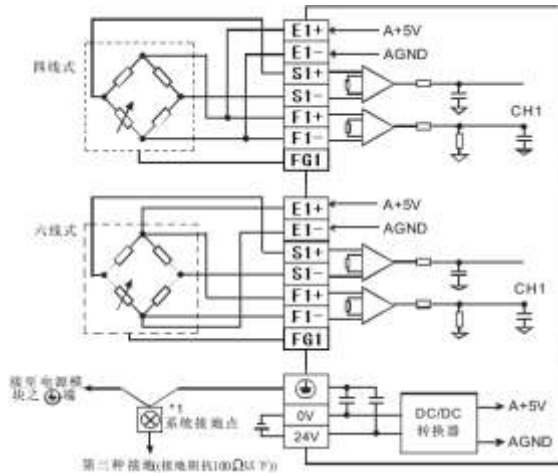
- ⑤ Module name
- ⑥ Terminals
- ⑦ Module slot
- ⑧ DIN rail
- ⑨ DIN rail
- ⑩ Mounting hole: $\phi 4.5$

- Please use the crimp-style terminals shown in the left figure.
- Apply 0.5 to 0.8 N.m torque to tighten the terminals

3.1 Terminals instruction

Terminals	Instruction	Terminals	Instruction
24V+	Power supply+	24V-	Power supply-
GND	Grounding	FG1	Sensor grounding
E1-	Power supply- (5V) for sensor	E2-	Power supply- (5V) for sensor
E1+	Power supply+ (5V) for sensor	E2+	Power supply+ (5V) for sensor
S1-	Signal output- of sensor	S2-	Signal output- of sensor
S1+	Signal output+ of sensor	S2+	Signal output+ of sensor
F1-	Feedback- of sensor	F2-	Feedback- of sensor
F1+	Feedback+ of sensor	F2+	Feedback+ of sensor
▪	Unused	FG1	Sensor grounding

4. Wiring



Note:

1. The impedance of the weighing sensor is greater than 50 ohm.
2. The sensors with four wires requires E1 + connecting with F1 +, E1 - connecting with F1 -.

5. BFM instruction

5.1 BFM instruction

BFM		Latched	Read/Write	Function	Default	Range	Description
CH1	CH2						
0		O	R	Model	5011		LX3V-2WT model name
1		O	R	System version	116		System version
2	42	O	R/W	Unipolar/bipolar	0	0-1	0: bipolar, 1: unipolar
3	43	O	R/W	Frequency	1	0-9	0: 7.55Hz 1: 10Hz 2: 25Hz 3: 50Hz 4: 60Hz 5: 150Hz 6: 300Hz 7: 600 8: 960 9: 2400
4	44	X	R	State	0		b0: CH1 No-load b1: Reserved b2: CH1 overload b3: Reserved b4: CH1 measured value is stable b5-b15: Reserved
5	45	X	R	Error	0		0: No error, 1: Error b0: Power supply error b1: Hardware error b2: CH1 conversion error b3-b15: Reserved
6	46	X	R/W	Tare weight	0		Save tare weight by current weight: 0: Disable; 1: Enable, reset to 0;
7	47	O	R/W	Gross/Net weight	0		Display gross weight or net weight by current weight 0: CH1 gross weigh; 1: CH1 net weight; 0xF: CH1 closed

Note:

O: Yes, X: No, R: Read, W: Write

BFM	Latched	Read/Write	Function	Default	Range	Description	
8	48	X	R/W	Calibrating weight	0	0 by default. 0x0001:CH1 return to 0 0x0002:CH1 calibrating: Step1:Remove all load ; Step2:BFM #8 shows 0x0001 ; Step3:Add known weight; Step4:Write known weight to BFM#23, Step5:BFM #8 shows0x0002	
9	49	X	R/W	Reset to default	0	1:Reset	Reset all BFM values to default
10	50	O	R/W	Filtering mode	0	0-1	
11	51	O	R/W	Filtering strength	3	0-7	
12	52	O	R/W	Zero tracking intensity	0	0-200	The value of zero tracking intensity (0: disable zero tracking)
13	53	O	R/W	Zero tracking range	0	0-300	The value of zero tracking range (0: no limit)
14	54	O	R/W	Automatically zeroing	0	0-4	0:Disable auto zeroing 1:±2%MAX 2:±5%MAX 3:±10%MAX 4:±20%MAX
15	55	X	R	Reserved	0		
16	56	X	R	Ch1 average L	0	Signed	Average weight of CH1 (Low)
17	57			Ch1 average H			Average weight of CH1 (High)
18	58	O	R/W	CH1sliding average	5	1-50	Setting range:K1~K50 Default value: K12
19	59	O	R/W	CH1Tare weight	0		Range: K-8388608~K8388607 Default value: K0
20	60						
21	61	O	R/W	Ch1 standstill checking times	10	1-500	Ch1 standstill checking times (5.3-2)
22	62	O	R/W	Ch1 checking range	10	1-10000	Eample: checking time: 10ms, standstill checking times: 10, checking range: 1000, when variation is greater than 1000, this measured value is not stable, BMF#4-b4 will be 0. If not BMF#4-b4 will be 1.
23	63	O	R/W	Ch1 calibration weight value	1000	-8388608 ~8388607	#8
24	64	O					
25	65	O	R/W	Ch1 maximum weight	32767	-8388608 ~8388607	Show error when exceeds Max.weight value
26	66	O					
27	67	O	R/W	Ch1 zero limit (High limit)	10	-8388608 ~8388607	Bit of zero weight equals to 1 when all of load removed
28	68	O					
29	69	O	R/W	Ch1 zero limit (Low limit)	-10	-8388608 ~8388607	
30	70	O					
31	71	X	R/W	Additional function Parameters	0	0~1	0: default, additional function OFF 1: Filter reset ON
32	72	X	R/W	Additional function Parameters	0	0~100	Filter reset ON: 0: OFF; 1~100: Reset the number of sampling period in the filter needs to wait for.
33	73	X	R	Digital value L	0	-	ADC collected digital value
34	74	X	R	Digital value H			
BFM#35-#41, BFM#75-#81: reserved							

Note: Symbol description

O: hold, X: unhold, R: read only, W: read and write.

5.2 Buffer (BFM) description

- (1) BFM0: Module code
LX3V-1WT code: 5011。
- (2) BFM1: module version
Module version (decimal).example BFM1=116, meansV1. 1. 6。
- (3) BFM2: Polarity
Due to the singed integer(from analog to digital, so value for Bipolar will be minus
- (4) BFM3:sampling frequency
The frequency of input signal collection, lower frequency, more stable; higher precision, lower speed
Relationship between set value and the sampling frequency:

Setting	Sample frequency (Hz)	Sample precision (Bits)	Setting	Sample frequency (Hz)	Sample precision (Bits)
0	7.5	23.5	5	150	21.5
1	10	23.5	6	300	21
2	25	23	7	600	20.5
3	50	22	8	960	20
4	60	22	9	2400	17.5

(5)BFM4: State code

Bit. NO	Note	Bit. NO	Note
Bit0	Ch1 no-load	Bit1	Ch2 no-load
Bit2	Ch1 over-load	Bit3	Ch2 over-load
Bit4	Ch1 stable	Bit5	Ch2 stable
Others: Reserved			

(6)BFM5: Error code

Bit.NO	Value	Error	Bit	Value	Error
Bit0	K1(H0001)	Power failure	Bit1	K1(H0001)	Hardware failure
Bit2	K4(H0004)	Ch1 conversion error	Bit3	K8(H0008)	Ch2 conversion error
Other	Reserved				
Note: Save all error state of data registers, each error status is determined by the corresponding bit, there are May generate more than two states at same time, 0: no error, 1: error.					

(7)BFM6: Tare setting

Select the current weight value (BFM16-17) as a tare (BFM19-20) weight value. Each channel occupies one bit, available when 1, Reset to zero automatically.

For example:

The current weight is 100, after setting tare weight:

If it displays gross weight (BFM7 = 0) currently, the tare weight (BFM19-20) will become 100, the current weight is still 100;

If it displays net weight (BFM7 = 1), the tare weight (BFM19-20) will be original value + current weight value, the current weight value becomes zero.

(8) BFM11: filtering strength

The higher filter strength, the more stable and accurate weight value.

(9) BFM12: zero tracking strength

Zero-tracking is to make stable when no-load, Zero tracking is alleged intensity values within this range, used to reduce the influence of temperature.

Setting	Description	Note
0	Zero tracking OFF	Default
1-200	Range of weight value	10 means ± 10
Others	Reserved	
Note: when lower precision required, you may disable this funtion.		

(10)BFM13:Range of Zero tracking

Accumulated range of zero tracking, stop tracking when out of range

Setting	Description	Note
0	No limit for zero tracking	Default
1-300	Range of weight value	10 means ± 10
Others	Reserved	
Note: when lower precision required, you may disable this funtion		

Example: Setting value is 100,when the position within ± 100 , it will be read as no-load.

5.3 Function Instruction

5.3.1. Weight measurement

Normally, we can choose to measure the net weight or gross weight of an object. The net weight means the weight of the product itself, that is, the actual weight of the product without its external packaging. The weight of the packaging is called the tare weight. The gross weight is the total weight, namely the net weight plus the tare weight.

- Tare weight: Weight of the packaging
- Net weight: The weight of the product, excluding the packaging.
- Gross weight: The net weight plus the tare of the product.
- Gross weight = net weight + tare weight

Example: A product weighs 10kg and the carton contains it weighs 0.2kg, then its gross weight is 10.2kg. (net weight = 10kg, tare weight = 0.2kg, gross weight = 10.2kg)

Example:

Use the measured value at CH1 as the net weight and disable CH2. If you know the weight of the packaging already, you can skip the step of reading the tare weight.

1). Read the tare weight

Step 1: Write H'0000 into CR#7.

Step 2: Place the packaging on the CH1 load cell.

Step 3: Write H0001 into CR#6 to take the weight of the packaging as the tare weight.

2). Set CR#7 = H00F1.

5.3.2. Standstill Check

When an object is placed on the load cell to measure its weight, you can use the standstill check to know that the measured value has been stable.

· If the measured value shifts within the range for standstill check set up by the user, bit4 will be set to "1".

· If the measured value shifts beyond the range for standstill check set up by the user, bit4 will be set to "0". They will be set to "1" again when the range is returned to the set range.

Example: The measuring time is 10ms, the times of standstill check is 10, and the range for standstill check is 1,000.

When the range for standstill check exceeds 1,000, the measured value will be regarded unstable, i.e. bit4 will be set to 0. When the measuring time is within 100ms (10 × 10ms) and the range returns to be within 1,000, bit4 will be set to 1 again. We recommend you check if the measured value is stable enough before operating it.

5.3.3. Zero detection

You can use this function to know if the object has been removed from the load cell. If the bit4 is 1, and the bit0 and bit1 are 1 as well, the object has been removed from the load cell already, and you will be able to perform the next step of the control.

5.3.4. Filtering

The average value is a steady value obtained from the sum of the read values. However, due to unavoidable external factors, the read values may be an acute pulse, resulting in fierce changes in the average value. The filtering function thus exclude the read value that is an acute pulse from the sum-up and equalization, so the average value obtained will not be affected by the acute read value.

6. Example

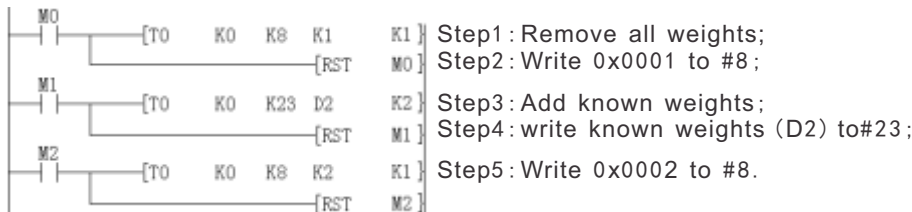
6.1 Current state of weight



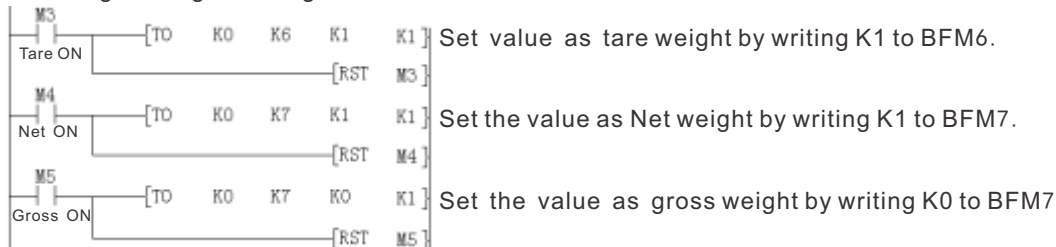
6.2 Get current weight value



6.3 Calibrating weight

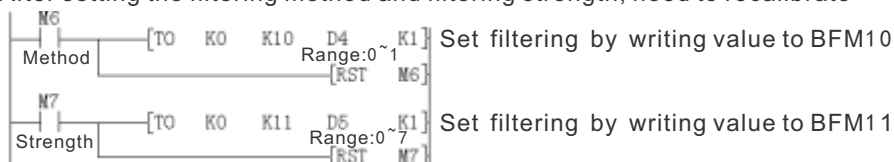


6.4 Tare weight and gross weight

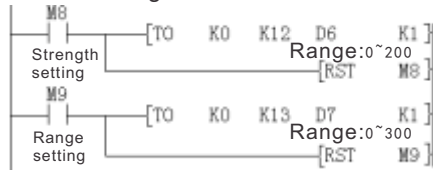


6.5 Filter method and strength

After setting the filtering method and filtering strength, need to recalibrate



6.6 Zero tracking



7. Diagnosis

7.1 Check

- I. Make sure all cables placed in right position.
- II. Make sure the number of special function modules can not be greater than 8, and the total I / O points does not exceed 256 points.
- III. Make sure select the correct operating range in application.
- IV. Make sure power supply is working properly.
- V. LX3V CPU unit is in RUN mode.

7.2 Check the error:

- Check the following items, if LX3V-2WT can not work properly:
 - Check the LED state of power supply
 - ON: Check the module connection cable
 - OFF: checke the module connection cable
- Check the wiring
- Check the state of LED"COM" (on the right top corner of LX3V-2WT)
 - ON: Communicating.
 - OFF: Check the sate of #5 (error), any bit(b0 b1 b2) in #5 is ON, means communication failure, refer to 5.2-(6)to find out the reason.