Contents

CAUTION

.This is not a toy. Keep out of reach of children;
.This controller is not an explosion proof device;
.This controller is not a water proof device;
.Do not open this controller, no user serviceable parts inside. Always contact supplier for service.

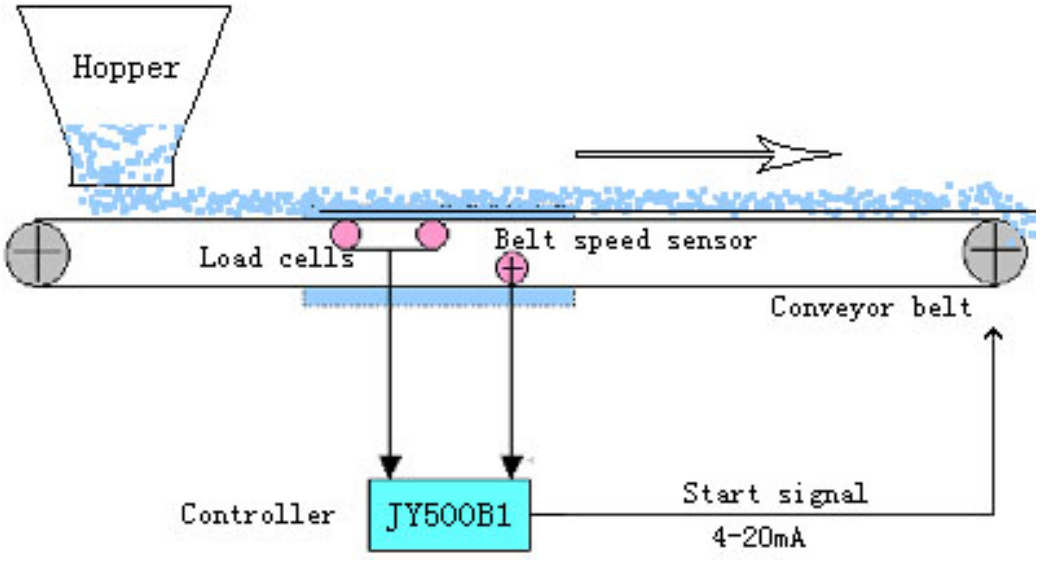
1. Introduction of Product

1.1 About us

JY500B series of belt scale controller provide outstanding functionality, flexibility and reliability through innovative design with the incorporation of state-of-the-art technology all on a common modular platform. Each instrument model is designed for specific applications and is able to be upgraded with plug in boards making it suitable for the majority of production control and monitoring functions including providing valuable data which is essential in industry today in order to satisfy up-to-the-minute process requirements.

JY500B belt scale controller adopts 32-bit microprocessor electronics with a 110x30mm display and high speed ∑-A/D conversion method with max.100 times/s conversion speed. It can make up batching scale with load cell and other mechanical parts, applied in high speed and high precision weighing control occasion.

Application in Belt Scale System



JY500B1 is mainly apply to bulk measurement in various industries such as power generation, coal industry, metallurgy, mining, harbor, chemical and building material industry.

This manual applies to controlling systems equipped with conveyor blet.

1. Weigh feeder
   Control of feed rate via belt speed

2. Belt weigher with controlled prefeeder
   Control of feed rate via belt load

3. Belt weigher with constant load
   Control of belt load via belt speed

1.2 Function Features

1.2.1 Have digital switching and analog I/O interface, easy to connect with Host compute, crates to DOS system and realize remote control operation.

1.2.2 Use a variety of standard communication protocols such as MODBUS, with a corresponding communication interface, easy to use FIELDBUS technology, crates to FCS system, and realize digital system.

1.2.3 Data storage using a combination of FLASH and RAM mode, various processes data can be saved automatically when the system is powered down, can keep running on the original process parameters when the system is re-power.

1.2.4 Input related parameters and installation verification data without physical calibration, the system generates correction factor automatically without physical calibration, realize hi-intellectualized weighing calibration and verification.

1.2.5 Provide linearization correction routine real-time zero calibration, ensure accurate weighing and long-term stability.

1.2.6 Intelligent PI regulator can realize unperturbed switchover of feed rate and volume feeding synchronously.

1.2.7 With real-time tips, check, events alarm function on system operation information and events information.

1.2.8 Use high-reliability industrial grade component and advanced anti-jamming technology, have tremendous anti - jamming ability to static electricity, sparks, electromagnetic, etc.

2. Technical Data

2.1 Parameters

Model	JY500B1
Ext.Power supply	DC 24V, ±10%
Power	＜30W
Working temperature	-10-40℃
Humidity	≤90%RH
Dimension	288（W）x 190（D）x 95（H）mm
Protective class	IP54
Opening Size	280（W）x 85（H）mm
Weight	＜2.5 Kg
linearity	0.01FS
Accuracy	0.1%
Tolerance	0-99999900 t
Feed rate	0.0020-99999.9 t/h
Division	0.001kg、0.01kg、0.1kg、1kg、0.1t、1
Load cell excitation	DC 9V, 250mA
Max.net signal input	≤30mV
Load cell type	Resistance strain
Speed sensor	DC ≤24V, 50mA
Speed pulse	0-3000Hz, 0-24V
Speed sensor type	Optical / Magnetic / Hall sensor / proxir switch
Analog Input	0-20mA, Long-distance setting the flow signal by DCS interface
Analog Output	0-20mA, 2 Ports 1 Port for measure signal (Flow, speed, load signal optional) 2 Port for control signal
Digital Input	DC 24V, 3 routes Passive touch signal 1 route: external error acknowledge 2 route: external control for stop signal 3 route: external control for start signal 4 route: control for speed pulse input signal
Digital Output	AC 220V, 3A, 7 routes 1 route: start signal 2 route: flow deviation overrun signal 3 route: pre-start signal 4 route: remote set indicator signal 5 route: maximum value signal 6 route: minimum value signal

	7 route: trouble – free signal
Accumulated pulse output	Output pulse according to selected measurement unit
	Frequency<10Hz width 50–1000ms
MODBUS Interface:	RS232<=1.5m RS485<=1000m Default baud rate 9600 (MODBUS FIELDBUS technology)
Protected class	IP54

2.2 Diagram Of Panel

Front panel

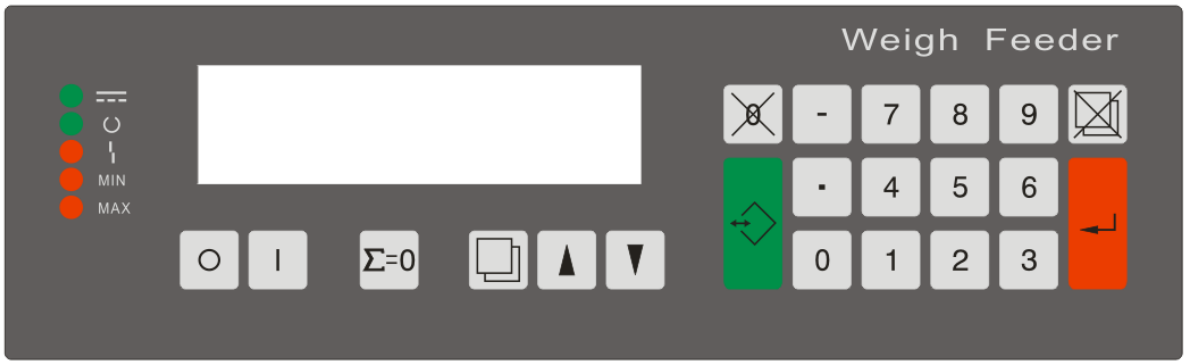


Figure 1: Panel

High-definition LCD screen, Chinese display. Character: 5x7 8x16

The left side of the instrument panel has five LED lights:

- Green ON: Normal
- Green ON: self-test normal
- Red Blinking: alarm event
- MIN Red ON: flow below lower limit. (Optional speed or load)
- MAX Red ON: flow is higher than upper limit. (Optional speed or load)

Two green lights, no alarm event, the instrument is ready.

Keyboard: Flexible membranes with tactile touch

Start/stop

Reset counter

FUNC Enter system menu

Up/down Select functions

DEL Acknowledge event message, delete input

ESC Interrupt input, Exit to previous menu

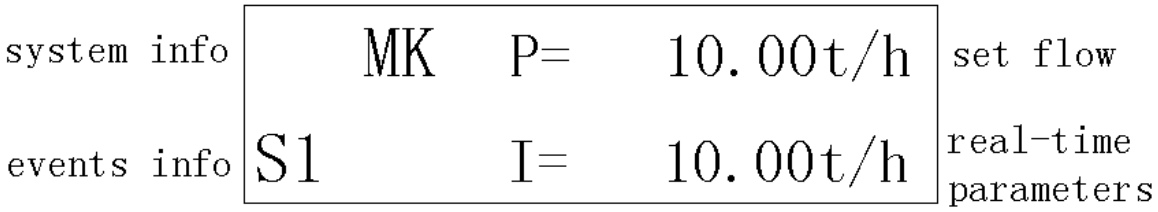
DAT Activate cursor, Prepare input, e.g. of set point

ENT Start function, Acknowledge input

0 ~ 9 Enter parameters

− ▪ Enter sign and decimal point

2.3 Main Interface Display



Two lines mark area at left. Upper is “system info”, lower is “events info”.
Two lines mark area at right. Upper is "set flow", "time", "batch info", lower is "real-time parameters."

2.4 Character Definition

2.4.1 Left upper (▪ key to select

I	Feed rate	kg/h or t/h
P	Feed rate setpoint (nominal value) by keyboard	t/h or kg/h
10:00	Time	

Select "Batch Mode", increase Zb and "Batch information."

0	Batch frequency	

2.4.2 Right bottom (▲ ▼ key to select)

Z_1 Z_2 Z_3	Class accumulate counter	kg or t
Z_1	Totalizing counter (Amount feed)	kg or t
I	Feed rate Material amount discharged from conveyor belt per unit time	kg/h or t/h
Ir	Feed rate/Nominal Feed rate ,feed rate relative	%

Pe External analog signal setpoint by DCS interface t/h or kg/h

Pr External setpoint for modification percentage ,relative setpoint %

Q Belt load. Weight of material on one belt meter kg/m

Qr Percentage for belt load. Belt load/nominal belt load %
Xd Deviation of feed rate %
When "Batch Mode" is selected, increase Zb, Zi, Zd. (See Chapter 4.6)

Zi Batch actual value kg or t

Zb Batch setpoint kg or t

Zd = Zb - Zi

2.4.3 System Mark

System info area have 4 positions, from left to right are pos1, pos 2, pos 3, pos 4.

pos1
R Run mark. Blank, standby; flashing, weighing run.

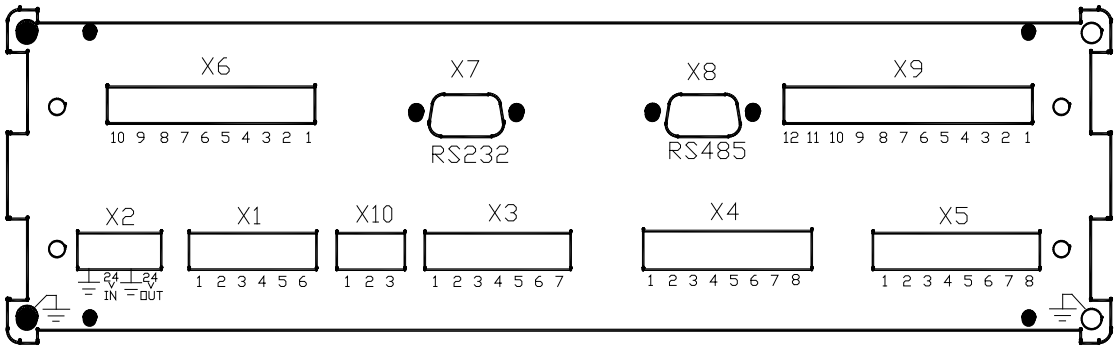
pos 2
M Weighing mode
V Volume mode

pos 3
F Batch overflow, this batch reaches set value Zb.
K Keyboard start/stop mode
S Serial star/stop mode
E Port start-stop mode

pos 4
K Set P by keyboard or serial port
S Set P by serial port
A Set P by current or voltage analog input

2.4.4 Events Info Area
S1 system events info code, consist of a letter and number. (See Chapter 9)
For example: S1 is EEROM failure.

2.5 Diagram Of Back Panel



X1, X2,X3, X4, X5, X6, X7, X8, X9, X10 are 5.08 green terminal block, straight-pin.
X7 is DR-9M male pin connector.
X8 is DR-9M male pin connector.

2.6 Port Connection

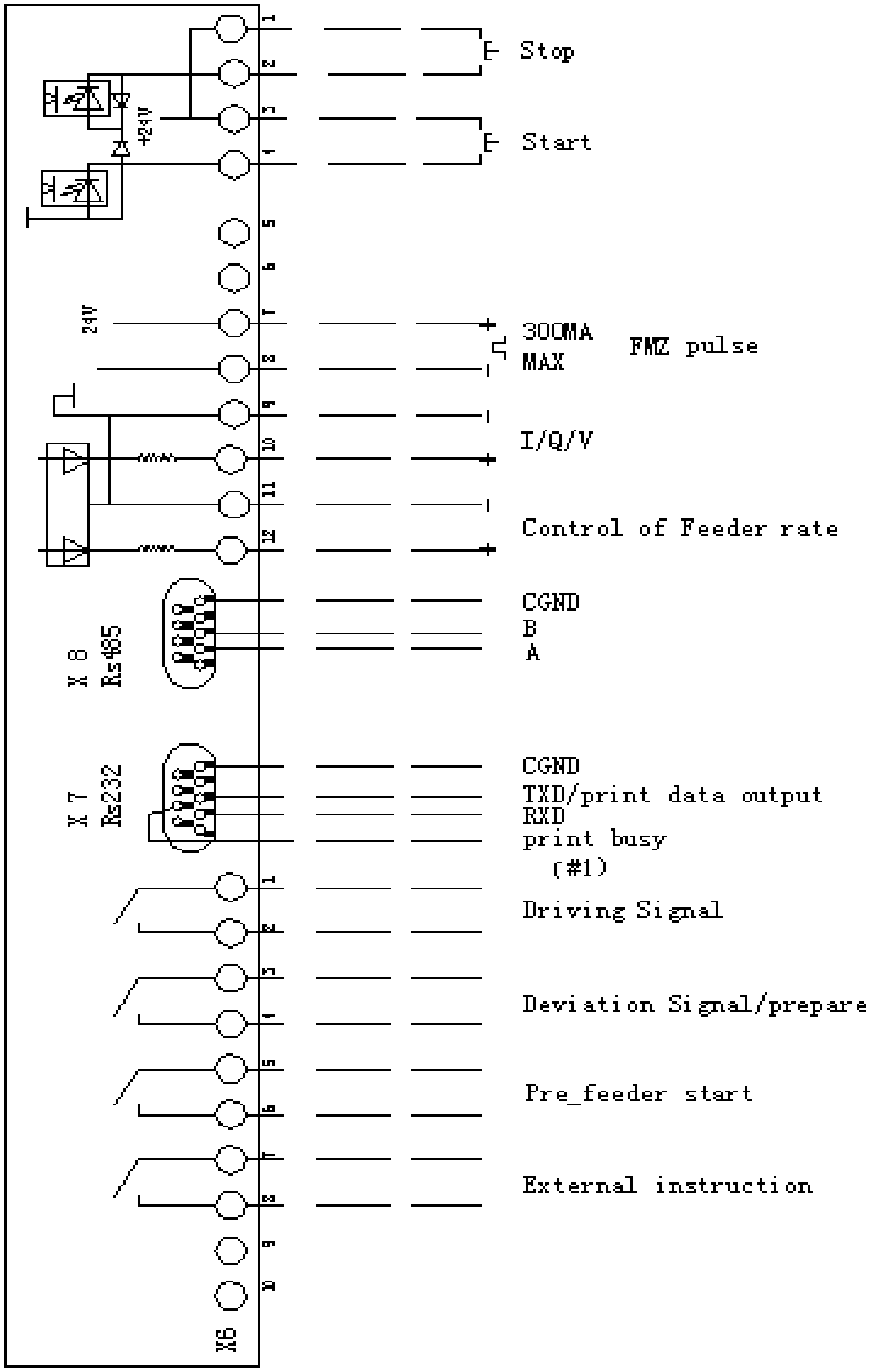


Figure 4: Connection Port 1

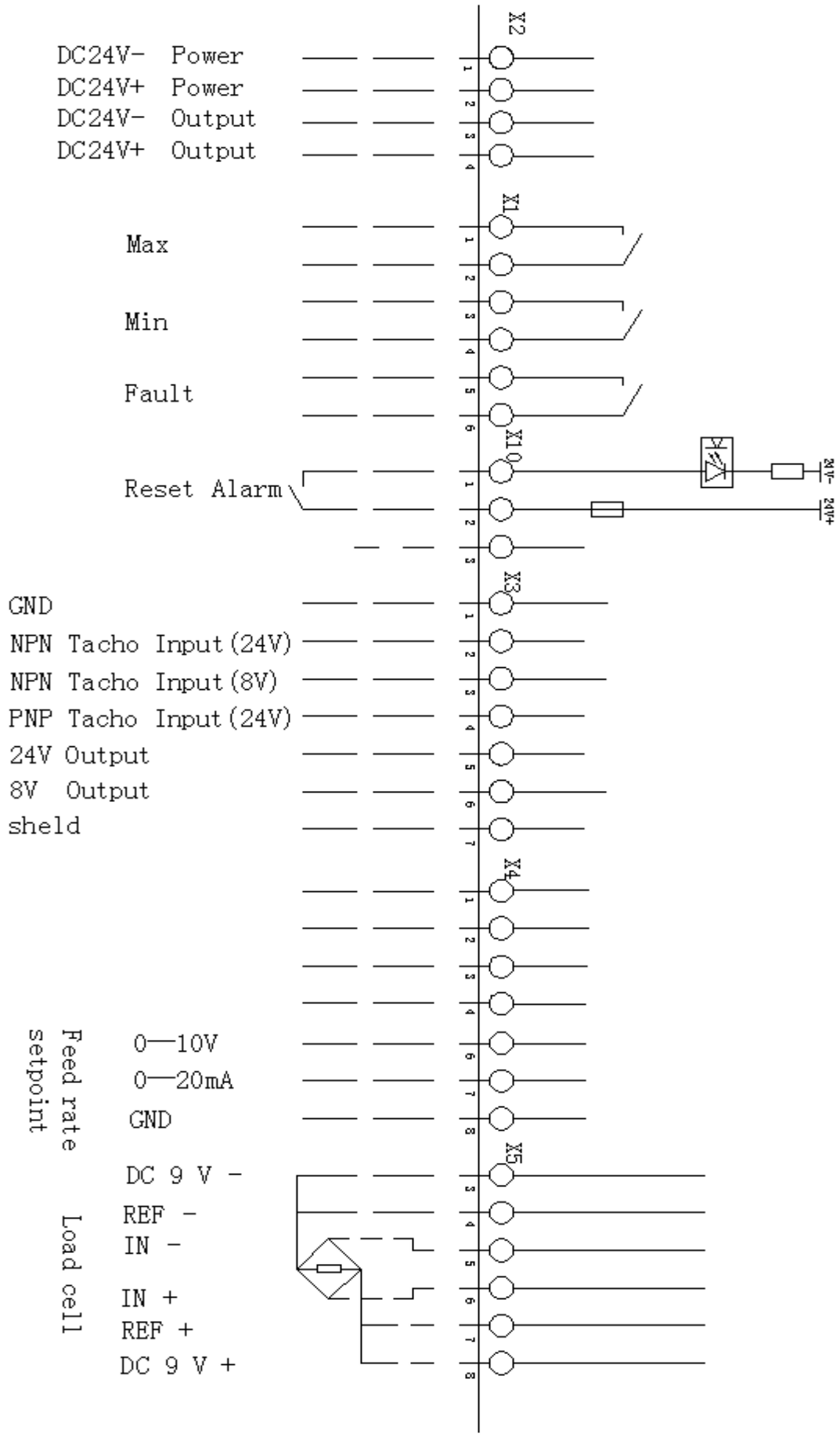


Figure 4: Connection Port 2

2.7 Port Definition

X1：

TERMINAL	FUNCTION	INTERFACE STANDARD
1，2	Max Signal Output: closed is valid	Passive Touch
3，4	Min Signal Output: closed is valid	Passive Touch
5，6	Fault-free Signal Output:switching off is valid	Passive Touch

X2：

TERMINAL	FUNCTION	INTERFACE STANDARD
1	DC24V- (Power Input)	DC24V
2	DC24V+ (Power Input)	DC24V
3	DC24V-(output)	DC24V
4	DC24V+(output)	DC24V

X3:

TERMINAL	FUNCTION	INTERFACE STANDARD
1	GND	
2	NPN Tacho Input(24v)	
3	NPN Tacho Input(8v)	
4	PNP Tacho Input(24v)	
5	24V output	DC24V
6	8V output	DC8V
7	sheld	

X4：

TERMINAL	FUNCTION	INTERFACE STANDARD
1~5	Reserve	
6	P setting input[+]	[DC]0~10V (Optional)
7	P setting input[+]	0~20mA (Optional)
8	P setting input[-]	COM

X5：

TERMINAL	FUNCTION	INTERFACE STANDARD
1，2	Reserve	

3	load cell EXC[–]	DC 9V [–]
4	Weighing load cell Compensating Signal [–]	REF [–]
5	Weighing load cell Input Signal [–]	IN [–]
6	Weighing load cell Input Signal [+]	IN [+]
7	Weighing load cell Compensating Signal [+]	REF[+]
8	load cell EXC [+]	DC 9V [+]

X6 :

TERMINAL	FUNCTION	INTERFACE STANDARD
1, 2	Driving signal : closed is valid	Passive Touch
3, 4	Deviation signal output : closed is valid	Passive Touch
5, 6	Pre-feeder start to output:closed is valid	Passive Touch
7, 8	External instruction : closed is valid	Passive Touch
9, 10	Reserve	Passive Touch

X7 :

TERMINAL	FUNCTION	INTERFACE STANDARD
2	TXD/ data output to Printer	RS232
3	RXD	RS232
5	GND	
7	Printer busy	

X8 :

TERMINAL	FUNCTION	INTERFACE STANDARD
2	A Terminal	RS485
3	B Terminal	RS485
5	GND	

X9 :

TERMINAL	FUNCTION	INTERFACE STANDARD
1, 2	External control signal to stop: Opened is valid	Passive touch input
3, 4	External control signal to start : the edge that closed after opened is valid	Passive touch
5, 6	Reserve	
7, 8	FMZ pulse output	MAX 300 mA (DC24V)
9 10	Flow(I),load(Q),speed(V) output [–] Flow(I),load(Q),speed(V) output [+]	0~20 mA [DC]

11 12	Control signal of Feeder rate output [–] Control signal of Feeder rate output [+]	0~20 mA [DC]

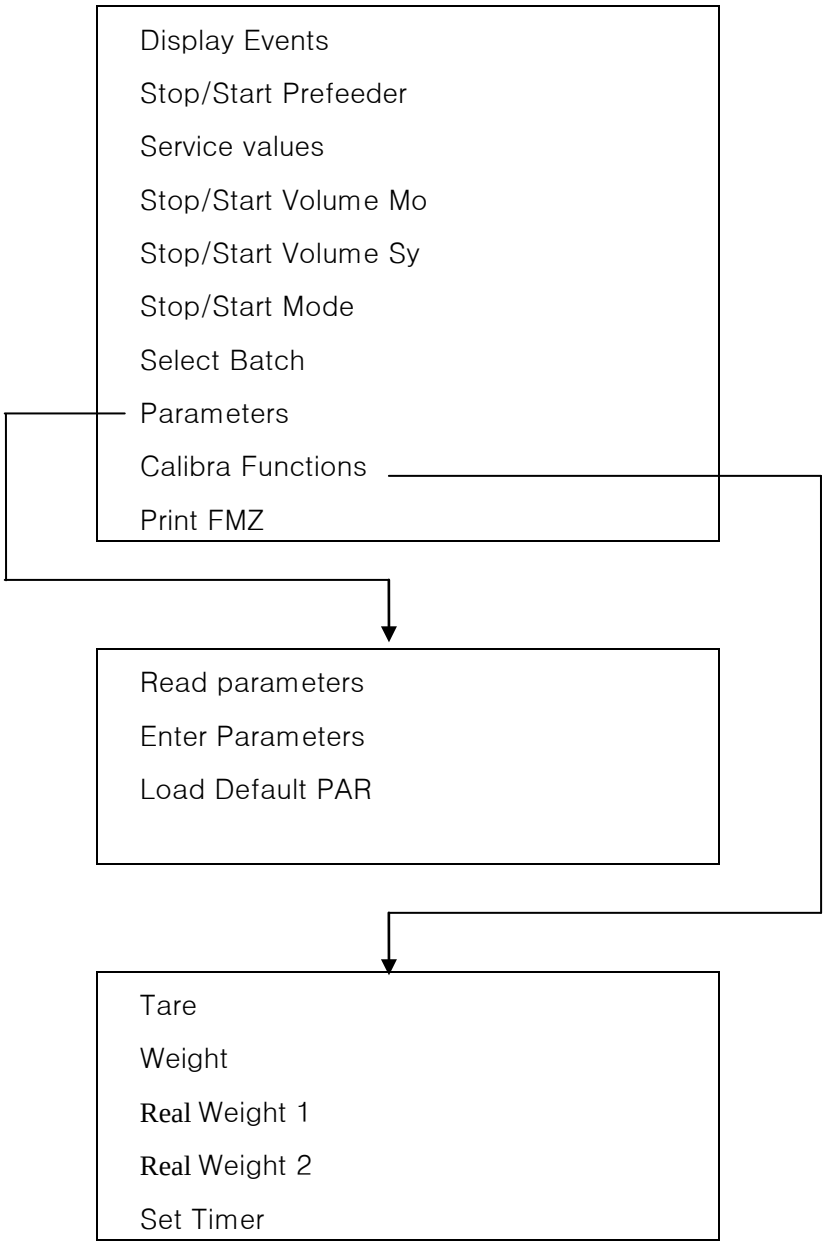
X10 :

TERMINAL	FUNCTION	INTERFACE STANDARD
1, 2	Reset Alarm : closed is valid	

3. System Menu

The system menu contains all the features of the instrument.

3.1 Menu Items



Select the "menu" and "calibration", will present two levels of submenus.

3.2 System Menu Entries

3.2.1 Display Events

All important scale functions are internally monitored. Errors are reported by events message.

3.2.2 Stop/Start Prefeeder

If the belt feeding end configured with feeder (prefeeder), only choose start“prefeeder”. When instrument stop / start operating, its X6 "prefeeder ports start" port have close/ disconnect switching value action, used to start / stop control prefeeder. When instrument check tare (self weight), should choose “stop prefeeder”, prefeeder will stop operating, instrument to accurately detect the tare.

3.2.3 Service values

Instrument stores state information for the current system, use the menu,state information are reported by service values. (see Chapter8)

3.2.4 Stop/Start Volum Mo

Weight Measuring Mo (stop Volum Mo) is the control mode. Instrument real-time output control signal according to preset flow settings, or adjust belt speed or adjust the feed rate of prefeeder. Volum Mo is uncontrollable mode. Instrument will be at load rating value (parameter D01) for belt load value, output fixed control signal to control belt speed and prefeeder according to preset flow set value proportional conversion.

3.2.5 Stop/Start Volum Sy

In contrast to Volumetric mode where the conveyor belt will directly run with the last speed of setpoint in **Volumetric Synchronous Mode** to save time for the PID adjustment. Let the feed rate reach the set point quickly. If stop the **Volum Sy** mode, the system speed will from the 0 to the set point gradually by the PID adjustment.

3.2.6 Stop/Start Mode

To select system stop/start control source in system menu, including keyboard, serial port, port. When stop/start mode selected keyboard or serial port or port, system info area appears corresponding identifier.

3.2.7 Select Batch

Exit continuous feeding and enter batch feeding way. (see chapter 4.6)

3.2.8 Parameters

Enter view, modify, reinstall the operating parameters. (see Chapter 6).

3.2.9 Calibra Functions .

Enter the system calibration weighing calibration operation. (see Chapter 5).

3.2.10 Print FMZ

If configure printer, Z0, Z1, Z2, Z3 result can be printed.

3.3 Call System Menu

 Call System Menu

 Select **“Parameters”** menu

Scroll the display into lower display field and acknowledge

Return to Previous Menu

4. Basic Operation

Connect to instrument power source, upper left two green lights on, no alarm event, the instrument display interface normal. When system info area display "M" character, normal power supply and instrument are ready to run.

4.1 Start/Stop Instrument

Two ways to control: instrument keyboard and external signal.
When the instrument is boot into the weighing state, operating mark "R" appears on system info area and flashing.

4.1.1 Instrument keyboard control stat/stop

Condition: system menu, start/stop mode, select "keyboard", system info area has mark "K".


To start, enter weighing operating.


To stop, back to standby state.

4.1.2 External signal control stat/stop

Condition: system menu, start/stop mode, select "Com." or "EXT.".

When start/stop mode select " Com.", instrument and computer constitute control system, start/stop control by communication interface command input.

When start/stop mode select " EXT.", start/stop control by 1.2 and 3.4 terminal switch signal input of X9. The signal source can be input of DCS system, also can be connected with manual button control.

4.2 Flow Setting

Implemented by instrument keyboard input, external analog input and serial digital input.

4.2.1 keyboard Input

Condition: parameter B07 select " Key.".

Press two times, screen display shows "P=..... T/h (or kg/h) ", cursor flashing.

0 ~ 9 Set value


Acknowledge input


Abort, Return

4.2.2 Serial Digital Input

Condition: parameter B07 select " Com.". (system inf area of screen display pos 4 have mark "S")
Flow set value set by instructions of host computer communication port.

4.2.3 External Analog Input

Condition: parameter B07 select "Ana.". (system inf area of screen display pos 4 have mark "A")
Flow set value by 6, 7, 8 terminals analog values of the analog input port X4 . (voltage or current)

4.3 External Flow Rate Setting And Correction

Because of the difference between standard transmission loss and amount of value, external flow settings received by instrument vary slightly from expect of host computer, or need to change external flow set value, can be correction by the directive.

Condition: 1) Parameter B07 select " Ana.".
2) Parameter B08 " PreExt. Active" select " Yes ".
3) Stop Volume Mo.

Implemented by Pr percentage setpoints, $P=Pe\times Pr$, Pe is external flow set value.


Press two times, screen display shows "Pr=..... ", cursor flashing.

0 ~ 9 Set value (percentage)


Acknowledge input


Abort, Return

4.4 Cumulation Remove

Σ=0 Enter into totalizing counter to clear zero

Select totalizing value (Z1, Z2, Z3, Z0) counter need to clean

Acknowledge, Clear totalizing value (Z1, Z2, Z3, Z0) counter

Abort, Return

4.5 Select Batch

Call the function, the controller feed with batch by batch. Main display will add the display of Zb, Zi, Zd parameter. Under display normal screen, can select display format of Zd, Zi and Zd. Zb, Zi, Zd same as counter Z0 by lower part display area of key.

Call system menu

Select “select batch”

Acknowledge, enter into “batch Perform”, select “start”, set batch upper Limit

Activate cursor, ready for input batch upper limit value

0 ~ 9 Input flow rate set value

Abort, keep original upper limit value Zb

Acknowledge, back to normal display

Waiting for “Start” operating instruction

Boot into the batch operation, can view the Zb, Zi, Zd dynamic values. When the Zi rises to the setting value Zb, batch operating stop automatically, conveyor belt and pre feeder stop running, system info area appears mark "F" , output print data automatically (the I06 parameters for automatic), or

Stop batch operating, waiting for “Start” operating instruction next time

Acknowledge, clear mark”F”, prepare to enter next batch operating. When complete batch operating, if exit

 Call system menu

 Select “Select Batch”, select “stop”

 Acknowledge, back to normal display. Batch info mark“0” , and Zb, Zi, Zd no longer display.

4.6 Print FMZ

 Call system menu

 Select “print result” entry

 Acknowledge, instrument can print current date, time, total production Z0, each class values Z1, Z2, Z3.

4.7 Display Events

When “events info” area appears events info code,  key to acknowledge display events fault. If there are a number of events code, needs to acknowledge one by one.
Also can enter info from outside, acknowledge by X10 fault acknowledgment, also can acknowledge by communication port command input.

If call events info, refer to chapter 9.

5. Calibration

When the B1 controller with the scale(such as weigh-feeder, belt scale) to form a weighing system, it run normally must before calibration. The weighing system's calibration and check weight, can be done by the calibration and taring function.

5.1 Condition of Calibration

5.1.1 Input the parameter **B block** by the actual demand of the weighing system. Input the parameter **C block** about the mechanical part of the scale. **C03** is the parameter of belt cycle time. Measure time of one belt circuit as exactly as possible and enter value into Parameter **C03.** (See Chapter 6)

5.1.2 When initial calibrate and recalibration, flow rate set value is P rated flow.
Parameter D02 is 1. Adjust and replace belt, or changes parameters B04, B05, or change parameters C03, C04, should recalibration.

5.1.3 Belt weigher no-load operating, and ensure belt without load, the normal sticky material formed in operating process can not clear.

5.1.4 Select "Volum. Mode", system info area appears mark "V".

5.1.5 Belt speed check, because check program does not include speed belt verification, belt speed accurately or not, affect "check belt periodic pulse" verification, setting of test device and speed sensor is different, parameter B04 have to calculate, can also adjust parameters B04 by belt speed check operating.
1) Using accurate measurement of belt circumference and cycle time, to calculate the speed of belt Vs.
2) Read meter belt speed Va at same time.
3) Compare and calculate, obtain the new B04 value:

$$B04(new) = B04(initial) \times Va / Vs$$

5.2 Taring

5.2.1 Purposes:Obtain belt basic weight and a periodic pulse number (optional), acknowledge cycle time of test run (pulse number), "taring calibration" no amount limit.

5.2.2 Operating


Call the system menu


Select "calibration"


Acknowledge, show "input password"

0 ~ 9 Input password"3.14159"

 Acknowledge

 Select “taring verification”

 Acknowledge, start calibration programme.

Top of the screen appears "press 1 only tare celibra", bottom of screen appears "press 2 periodic pulse and tare celibra". Press [1] only tare celibra, don’t do pulse number celibra of belt cycle. Press [2] for taring celibra, also do belt periodic pulse number celibra, obtain basic weight of belt scale and a belt periodic pulse number(optional), acknowledge cycle time of the test run (pulse number).

After the program is running, upper part of screen shows totalizing value of taring (unit same Z1), lower part shows basic weight of belt scale percentage for rated load.

 Accept operating results, instrument modifies parameters D04 and D06 automatically.

 Give up. Press this key in operating, abort, return.

Note: •Belt constant speed operating without measuring tape speed, when parameters B03 is "no measuring", when it is initial calibra, should run the program first, instrument will be generated internally belt periodic pulse value.

•Taring calibra is not limited values, when percentage is too large or the looptare of the next time taring is large must check belt loader.

• Subsequent operating select taring calibration, can not according to prescribed order of first calibration, select operating independently. Flow set value P can also be set at the time of work value.

• In calibration option, first time calibration of belt scale must select 2, obtain periodic pulse number, second time and after can select 1, only taring calibration.

5.3 Cumulation Check

5.3.1 Purposes: The cumulation check is designed for checking and testing the weighing system with simulation way. And it is used to acknowledge the precision whether meet standard or not. Before starting program, according to belt scale requirements, put certain weight validator (simulation calibration device, calibration bar, calibration weights, etc.) on determinate position, then acknowledge and convert load weighing value on effective weighing platform (effective simulation load), input parameters C10.

5.3.2 Operating

 Call system menu

Select “calibration”

Acknowledge, show “input “

0 ~ 9 Input password “3.14159”

Acknowledge

Select "cumulation calibration"

Acknowledge, start calibration programme.

After program running, upper of screen will show the cumulation value in running time, lower display the contrast between theoretical value and test value, said results with C0R.

- C0R at 0.99 ~ 1.01, accurate weighing, meet requirements.
- C0R at 0.95 ~ 1.05, can press ↵ key, input C0R value for parameter D02 values, as new new calibration factor.
- C0R<0.95 or C0R>1.05, deviation is too large, possibly parameter value of C group and D group input no correct (such as the leverage ratio, installation angle) or belt scale mechanical failure (such as alignment, card material, belt serious deviation etc.), after inspection, recalibration.

Note: • Should ensure the simulation calibration value in the total rated load belt scale specified value (rated load x effective platform length) between 30% ～ 100%.

• Subsequent operating select "cumulation calibration" , can not according to prescribed order of first calibration, select operating independently. Parameter D02 keep values after calibration, flow set value P can also be set at the time of work value.

5.4 Material Wei.Check 1

Using material calibration is cumulative weighing using actual delivery of materials.
Belt scale can be put into normal operating after "taring calibration", "cumulation calibration". In order to make the calibration more in line with conditions of actual operating or use, obtain weighing results with high accuracy, also can choose using material calibration.
Also subsequent timely use material calibration, to ensure accuracy of belt scale weighing.

5.4.1 Calibration conditions

1) Has completed the initial calibration and recalibration operation.
2) The material for calibration should be accurate weighing, weighing accuracy must be at least a grade higher than precision of belt scale weighing.

5.4.2 Operating

1) Keep parameter D02 after calibration, select "keyboard mode", flow set value P should be set when in normal work flow value. Flow set value P should be set flow value in normal work.
2) | key to start belt scale feeding, enter “material wei. check 1”, press 1 start operating, delivering known weight material on belt, after material through belt press 2 complete operating.
3) Then input actual material weight, instrument will calculate calibration factor automatically.

5.5 Material Wei.Check 2

5.5.1 Calibration conditions
1) Has completed the initial calibration and recalibration operation.
2) The material for calibration should be accurate weighing, weighing accuracy must be at least a grade higher than precision of belt scale weighing.
3) Total material weight for calibration is not less than 2% of belt scale feeder maximum throughput in one hour.

5.5.2 Operating
1) Keep parameter D02 after calibration, select "keyboard mode", flow set value P should be set when in normal work flow value. Flow set value P should be set flow value in normal work.
2) | key to start belt scale feeding, when instrument display weighing detection material accumulation meet calibration conditions material total weight, or pre accurate weighing material through belt scale, immediately press ○ stop operating.

5.5.3 Read weighing accumulation numerical value Wa compare with calibration material real numerical value, calculate new calibration factor, modified parameters D02.

$$D02(new)=D02(now) \times Ws / Wa$$

Note: • Can also choose to “material wei.check” program in “calibra”, start / stop operating according to program prompts, after acknowledge, instrument will automatically correct the D02 parameter value.

• If possible, can operate material wei.check two or three times, to obtain proper accurate calibration factor.

5.6 Set Time

Real time format × × (Hour) × × (Minute) × (Second), to 24 hours / day.

Real-time date format × × (Year) × × (Month) × × (Japan), year is 2 byte, last two digits of the year.
e.g. 09:20:30 on December 20, 2012
Input date 131220 time 092030

Operating;

Call system menu

Select“calibra”

Acknowledge, display “input commend”

Input commend “3.14159”

Acknowledge

Select“set time”

Acknowledge, enter real time set

Enter current date in a specific form

Acknowledge, back to previous menu

Delete fault input digital

6. Parameters

Parameter is the response of instrument functions, some parameters can input digitals (digital parameters) according to user's request, some parameters can only select (optional) according to instrument category. All parameters are preset with default value (default), these values are proved feasible data.

Parameters are divided into several combinations in capital letters. After the letter , it is the parameter's serial number, with brief description.

6.1 Parameter Overview

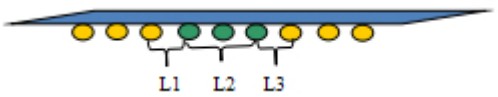
BLOCK A	Rated Data	Range	Default
A01	Langure_unit	Chinese, English	Chinese
	Select instrumentation language display. Only Chinese & English version have parameter A.		

BLOCK B	Rated Data	Range	Default
B01	Feed Rate Unit	Kg/h, t/h	t/h
	After acknowledge, appears decimal point select interface, select by ∧ ∨ Key, select B01 ensure screen P and I units and location of the deci point in weighing operating screen.		
B02	Nom. Feed unit	0.0020t/h–99999.9t/h	10.0 t/h
	The parameter only as limit values and events information for reference, according to maximum flow of belt scale feeder.		
B03	Tacho Active	Yes/No	Yes
	If select no, instrument will use B05 parameter in weighing calculation		
B04	vs Cbaract. val.	1.000 l/m ~ 100,000 l/m	10000.0 l/m
	The parameters affect system calibration and weighing accuracy, should input calculated pulse values for belt running one meter according to belt sca feeder speed measuring device structure.		
B05	Nominal Speed	0.0100 m/s ~ 10.000 m/s	0.1000m/s
	Instrument control value is 20mA, maximum speed of belt scale feeder. The parameter as reference value of ultimate value, when B03 chose not to test, for weighing calculation, influence the weighing accuracy.		
B06	VFD Brightness	40%, 60%, 100%	40%
B07	P Source	Key. Com. Ext	Key.
	Select flow set mode.		
B08	PreExt. Active	Yes,No	NO
	When B07 select ext.(serial, analog), the parameter decide whether modify flow set value percentage or not.		
B09	WZ Active	Yes,No	Yes
	Select YES, read load cell signal; select No, analog weight C08 as		

	weighing signal.		
B10	Z0 Unit	Kg, t, 10t, 100t	t
	Determine Zo measurement unit and decimal point.		
B11	Z0 Pulse dur.	50ms-1000ms	50ms
	Output ext. total accumulation pulse width, A weighing value pulse determined by B12. B11 and B12 shall be selected to ensure frequency of output pulse is less than 10Hz.		
B12	Z0 Pulse weight	0~1000000kg	1000kg
	Pulse magnitude, when accumulation reach a load weight load pulse emits a pulse signal width.		
B13	Z1 Unit	Kg, t, 10t, 100t	t
	Pulse magnitude, when accumulation reach a load weight load pulse emits a pulse signal width.		
B14	Z1 Timer	24 Hours / Day	80000(08:00:00)
	Last time Z1 count, start time is last time Z3 (B16).		
B15	Z2 Unit	Kg, t, 10t, 100t	t
	Z2 unit and decimal point selection.		
B16	Z2 Timer	24 Hours / Day	160000(16:00:00)
	Last time Z2 count, start time is last time Z1 (B12).		
B17	Z3 Unit	Kg, t, 10t, 100t	t
	Z3 unit and decimal point selection.		
B18	Z3 Timer	24 Hours / Day	240000(16:00:00)
	Last time Z3 count, start time is last time Z2 (B14).		
B19	Timer error	W1, W2, Ign, Alar	W2

BLOCK C will determine result of BLOCK D. Should in accordance with belt scale rule and configuration, and field measurement, ensure the data accurate.

BLOCK C	Enter Parameters	Range	Default
C01	Mains frequency	50Hz/60Hz	50Hz
C02	Belt Cyc. Numb	1-100(integer)	1
	When calibration, fitted belt running cycles (cyclomatic number).		
C03	Belt Cyc. Time	10-9999.0 s	30s
	Parameter C01 and C02 fixed system check and zero calibration procedure run time.		
C04	Belt Cyc.Length		30.000m
C05	L/C Charac. Value	0.5~9.9999mV/V	2mv/V
C06	L/C Rated Cap.	0.5~20000.0Kg	60.00Kg
	if belt scale with more than 1 load cell, input total rated load.		
C07	Eff. Platf. Length	0.1000~50.00m	0.5m
	L2+ (L1+L3)/2. L1, L3 represent length between nearest roller to roller with load cell.		



C08	Lever Ratio	0.0100~2.0000	1.0000

	C08=LWZ / LPG, LWZ: length between load sensor to leverage anchor; LPG: le between force center of load roller to leverage anchor.		
C09	Angle a	0.0~15.00degr	0.0
	Only for load sensor and carrier are assembled vertically.		
C10	Check Weight	1.000~22000.0	10.0 Kg
	Convert weight checker to effective analog weight on the effective weighing platf		

BLOCK D	Cal.Result	Range	Default
D01	Nom. Belt Load	D01=B02/B05×3600 B02:t/h B05:m/s,D01:kg/m	27.78Kg/m
	Reference for limits and zero calibration		
D02	Span Correction	0.5000~2.000	1.000
	Ensure weighing value accuracy, auto input after enter the cumulative weighing calibration result, can be manually modify too.		
D03	Total Tare	No input possible	
D04	Basic Tare N	No input possible	
	Including the weight of carrier, load cell roller, belt in the weighing Platform, etc.		
D05	Tare Correction	No input possible	
	Result of zero calibration.		
D06	Belt Cyc.velum	No input possible	
	Result of "Belt periodic pulse" program running, the instrument to parameter va to determine follow-up check running time of the program. To determine subsequent calibration running time.		

BLOCK E	Analog Output	Range/optional	Default
E01	Output Select	I, Q, V	I
	Determine X9 (9-10) analog output current definition.		
E02	Output MIN(AA)	0-20 mA	4 mA
	Determine output current lower limit value.		
E03	Output MAX(AA)	0-20 mA	20 mA
	Determine output current upper limit value.		

BLOCK F If the measure exceeds minimum / maximum value, display events information code.

BLOCK F	Limit Values	Range	Default
F01	Limit Value MIN	Imin, Qmin, Vmin	Imin
	Determine minimum event info definition, correspond to minimum alarm lam and minimum output terminal.		
F02	Limit Value MAX	Imax, Qmax, Vmax	Imax
	Determine maximum event info definition, correspond to maximum alarm la and maximum output terminal.		
F03	Value for I MIN	-10%~20%I	5%I
	Determine flow lower limit threshold, I rated flow (Parameter B02).		
F04	Event Clas.I MIN	W1 W2 Ign Alar	W2

	Determine flow lower limit information.		
F05	Value for I.MAX	100%~200%I	120%I
	Determine flow upper limit threshold, I rated flow (Parameter B02).		
F06	Event Clas.I MAX	W1 W2 Ign Alar	W2
	Determine flow upper limit information.		
F07	Value for Q MIN	-10%~200%Q	5%Q
	Determine load lower limit threshold, Q rated flow (Parameter D01).		
F08	Event Clas.Q MIN	W1 W2 Ign Alar	W2
	Determine load lower limit information.		
F09	Value for Q MAX	100%~200%Q	120%Q
	Determine upper lower limit threshold, Q rated flow (Parameter D01).		
F10	Event Classs Q MAX	W1 W2 Ign Alar	W2
	Determine load upper limit information.		
F11	Value for V MIN	-10~20.0%V	5%V
	Determine speed lower limit threshold, V rated flow (Parameter B05).		
F12	Event Class V MIN	W1 W2 Ign Alar	W2
	Determine speed lower limit information.		
F13	Value for V MAX	-10%~200%V	120%V
	Determine speed upper limit threshold, V rated flow (Parameter B05).		
F14	Event Class V MAX	W1 W2 Ign Alar	W2 (Events code H3)
	Determine speed upper limit information.		

BLOCK G Filter parameters do not affect instrument weighing results and accuracy, only to change parameter display and output.

BLOCK G	Filter Setting	Range	Default
G01	I Display delay	0.0~60.0s	3.0s
G02	I Analog Output	0.0~60.0s	3.0s
	Select E01 to flow, X9 (9-10) output filter.		
G03	I Interface	0.0~60.0s	3.0s
G04	Q Display	0.0~60.0s	3.0s
G05	V Display	0.0~60.0s	3.0s
G06	L/C Filter	0.0~60.0s	3.0s
G07	Belt Afterfl.Tim	0.0~60.0s	3.0s
	When system is outage, delay time of counter Z0 Z1 Z2 Z3 continues.		

BLOCK K Instrument automatic statistical power time and belt scale running time, output prompt maintenance information. After perform maintenance work, call-out event, press  key to acknowledge, instrument to start from zero again, automatic statistical running time once again.

BLOCK K	Inside Run	Range	Default
K01	Maintenance Elec	1~10000h	3000h
	Instrument power operating time interval.		
K02	Event Maint. EL.	W1 W2 Ign	Ign
	Operating time exceed K01, display event S3.		
K03	Maint.Run time	1~10000h	3000h

	Start belt scale running time interval.
K04	Event Maint.Run W1 W2 Ign Ign
	Operating time exceed K03, display event S4.

BLOCK Q	Event	Range	Default
Q01	Power Failure	W1,W2,Ign,Alar	W1 (code E1)
Q02	Memory Error	No input	(code --S1)
Q03	Tacho Input 1	W1,W2,Ign,Alar	W2
Q04	NO USE		
Q05	Namur Error GAI	W1,W2,Ign,Alar	W2
Q06	NO USE		
Q07	Namur Er.IMP/Blt	W1,W2,Ign,Alar	W2
Q08	L/C Input	W1,W2,Ign,Alar	A (code C1)
Q09	NO Release	W1,W2,Ign,Alar	W2 (code S2)
Q10	L/C Input>MAX	W1,W2,Ign,Alar	W1 (code H4)
Q11	L/C Input<MIN	W1,W2,Ign,Alar	W1 (code L4)
Q12	Password active		
	After password input, display S5, repeat operating do not have to enter the password in two minutes.		
Q13	No input		

BLOCK R	Control	Range	Default
R01	Controller Type	Standard, Univers	Standard
	Standard mode: Analog output only used to control the belt or feeding system speed. Universe mode: add a analog output (bypass), so it can be used in multi contro system, ex. Double speed control.		
R02	P-Component	0.000~2.000	0.2
	Parameter P in adjustment PID, the bigger P is, adjustment bigger, too big wo cause shock.		
R03	I-Component	0.000~2.000	0.2
	Parameter I in adjustment PID, the bigger I is, adjustment smaller, company wit parameter P, would set system steady soon, parameter D is canceled, in fact, adjust D would easily cause shock.		
R04	Contr.Dev.Filter	0.0~600.0s	3.0s
	Flow deviation Xd filter.		
R05	Contr.Dev.Time	0.0~600.0s	20.0s
	In R05 range, when R04 absolute deviation exceeded R06 range, display event H5.		
R06	Max.Contr.Dev.	0.0~100%	5.0%
	To set deviation range, the deviation value is percentage of the set flow value.		
R07	Contr.Deviation	W1,W2,Ign,Alar	W1 (code H5)
	Relative parameters: R04, R05, R06.		
R08	Controller Ird	W1,W2,Ign,Alar	W1

	Monitor X9(11-12), when analog value reached R10, display event H6.		
R09	Lower Limit	0~20mA	4mA
	Determinate X9 (11 - 12) lower limit value.		
R10	Upper Limit	0~20mA	20mA
	Determinate X9 (11 - 12) upper limit value.		
R11	Conter.Magn.Elev	0~20mA	0mA
	To quickly control the output value, set a start control value, control value start f the start value. getting PI superposition. When control value exceeded R11, R11 be invalid.		
R12	Position at Stop	0, R09	R09
	When system stop, output of X9(11-12), 0:0mA; R09: low limit of parameter R09.		
R13	Start-up	0.00~2.00Uml	0.00Uml
	In "Weighing" mode, when instrument boot up, control flow control the output according to la stable value, first control belt run the R13 setting value, then PID control. Generally used for large-lag control system, after instrument boot up, can reach stable control value quickly.		
R14	Clearance	0.00~2.00Uml	0.00Uml
	Generally used for control pre-feeder feeding, when instrument stop, pre-feeder feeding stop running and PID control adjustment stop, system began to clean material, atfer belt running F setting value, system stop running, ensure the without load of belt.		
R15	Setpoint Zero Up	0-8.00mA	5.60mA
R16	Setpoint Range	0~20.00mA	20.00mA
	Confirm upper limit X4(7-8), flow value correspond the input analog upper limit. value correspond rated flow B02, if input voltage. 10V correspond 20mA.		
R17	Zero Setpoint	0~20.00mA	4mA
	Confirm lower limit X4(7-8), R17 value correspond 0 flow setpoint.		
R18	Store	No YES YES(A)	No
	"NO" don't save the value "YES" save the current control value, next time start, this value will be effecti "YES(A)" save the current control value, next time start, this value will be effec but will not save the value if it is stop in warning.		
R19	Volumetric Mode	Qcst; Ycst	Qcst
R20	Bypass	0~20.00mA	0.00mA
R21	Port X6:34 func	Ready; deviation	Ready
R22	Z Control in vol.	Close ;Open	Open
R23	Start&Zero Mode	Off U_cycle, U_second	Off

"off" state: no tare and zero function before system start

"U_cycles" state: run clear and zero function for set up cycles, then enter program

Ex.: set the "Start&Clear Time" value as 1 and set the "Start&Zero time", value as 2 , belt run 1 cycle for Material function then belt run 2 cycle for Zero function, then enter program.

"U_seconds" state: run clear and zero function for set up seconds, then enter program

Ex: set the "Start&Clear Time" value as 1 and set the "Start&Zero time" value as 2 , belt run 1 second for clear Ma function then belt run 2 second for Zero function, then enter program.

R24	Start&Clear Time	0-1200	0
R25	Start&Zero time	0-1200	0

BLOCK L	Communication	Range	Default
L01	Address	1~127	1
	Slave address of MODBUS protocol.		
L02	Port	R232; R485; No	R232
	MODBUS communication protocol interface.		
L03	Baud Rate	4800; 9600; 19K2; 38K4	9600

BLOCK P	Linearization	range	default
P01	Lin.start/stop	ON OFF	OFF
	Use this function to linearize the belt loading measurement. Application see chapter 7.		
P02	Lin-S1	0.01~1000.00%Q	20%Q
	Reference: rated the belt loading (parameter D01). Linearization point 1: actual belt load weight, check weight or material measurement result.		
P03	Lin-I1	0.01~1000.00%Q	20%Q
	Reference: rated the belt loading (parameter D01). Linearization point 1: belt loading instrument measured.		
P04	Lin-S2	0.01~1000.00%Q	40%Q
	Linearization point 2: see P02.		
P05	Lin-I2	0.01~1000.00%Q	40%Q
	Linearization point 2: see P03.		
P06	Lin-S3	0.01~1000.00%Q	60%Q
	Linearization point 3: see P02.		
P07	Lin-I3	0.01~1000.00%Q	60%Q
	Linearization point 3: see P03.		
P08	Lin-S4	0.01~1000.00%Q	80%Q
	Linearization point 4: see P02.		
P09	Lin-I4	0.01~1000.00%Q	80%Q
	Linearization point 4: see P03.		
P10	Lin-S5	0.01~1000.00%Q	100%Q
	Linearization point 5: see P02.		
P11	Lin-I5	0.01~1000.00%Q	100%Q
	Linearization point 5: see P03.		
P12	LIN. Error	W1,W2,Ign,Alar	W1 (event code: S6)
	When enabled will monitor the correction of linear point. 1, start linearization when parameters change.		

BLOCK H	Additional Device	Range	Default
H01	ZDO Active	Open/ Close	Close
H02	ZDO limit	0.0~10.0%Q	1.0%Q

	Q is rated load (Parameter D01 below is same).		
H03	Auto Zero Active	Open/ Close	Close
H04	Mean Limit Value	0.0~30.0%Q	1.0%Q
H05	Zeroing Limit	0.0~100.0%Q	5.0%Q
H06	Pirnt Time 1	0~25h	25h
H07	Pirnt Time 2	0~25h	25h
H08	Pirnt Time 3	0~25h	25h
H09	Pirnt Time 4	0~25h	25h
H10	Type time5	0~25h	25h

6.2 Call System Menu

6.2.1 View Parameters

Will not affect the operation of the current system


Call system menu


Select “Parameters” menu

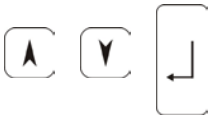

Enter submenu


Select the submenu “Read parameters”


Enter, display block B prameters


Scroll through parameter blocks


Enter. display the first parameter of the selected block


Read the parameter of the block


Return to Previous Menu

6.2.2 Modify Parameter

Only can modify parameter that will not affect current weighing system when it is in operating, modify the parameters are password protected.


Call System menu


Select the “Parameters” Menu


Enter submenu

Select “Modify Parameters” submenu

Enter. It will prompt for a password

0 ~ 9 Input the password 3.14159, enter (Password program will be effective in 2 minutes, within 2 minutes no need to input the password again if modify another parameter.)

Select parameter block

Enter. display the first parameter of the selected block

Select parameter

Enter

Activate cursor. Ready for input

OR 0 ~ 9 select parameter or input value

Input value or delete current value, enter new value

Exit, back to Previous Menu

6.2.3 Load Default Parameters

Call system menu

Select “Parameters” menu

Enter submenu

Select submenu “Load Default Parameter”

0 ~ 9 Input the Password 3.95141, enter. Prompt: Load Default Parameter?

NOTE: after loaded default parameter, all the parameters will be factory settings.

Enter, load default value or

Abandon, return to previous menu

7. Linearization check

7.1 Overview

Normally belt load needs no Linearization. Linearization makes good sense only with strong belt load variations and simple mechanical weighing systems. Following several cases, linearization correction before there may be a better practical results.

7.1.1 Weigh Belt Feeder with very simple mechanical weighing system architecture; rough processing carrier; instable carrier frame; the supporting spring distorted or hardness not enough, or no automatic belt tension adjusting device and automatic correction device, or maintenance ineffective, all that resulting in poor running of the actual effect.

7.1.2 Belt flexibility is poor, use the built-in steel tape that with uneven thickness or have surface shed damage problem, conveyor scale body collimation is not guaranteed.

7.1.3 Pre- feeder is not controlled, intermittent feeding, or flow fluctuations, material flow is very unstable.

7.1.4 When system in check, or a subsequent operation, found after correction coefficient (D02) to determine the individual points of traffic and load weighing apparent tolerance, meaning that there is a clear non-linear point.

7.1.5 Linearization check procedure is calibrating nonlinear implement of belt load measurement. you can do multi-point calibration, divided the rated load into several points, also you can look 1 or 2 obvious nonlinear points, in actual use, the selected point calibration better than multi-point calibration .

Linearization correction based on the rated load of the reference value, the percentage of the rated load calibration weight.

Linearization correction is generally used in two ways, first using the simulator (such as hanging yards) as a calibration weight , the second is to use the actual weight of the material as a check , the former are generally used for multi-point calibration , the second is for selected point calibration .

7.2 Calibration Using Check Weights

Conditions: belt scale carrier has a supporting frame which to place the.

7.2.1 Select load percent of the selected point 1, calculate the effective weight W1, placed the weight on the belt scale carrier bracket, and make sure no other material load.

7.2.2 Start belt according to a certain speed.

7.2.3 Program running result, read load percentage Qr on low portion of instrument display, Select many Qr values when the system is in operation, calculate the average value of many Qr values as

Q1

7.2.4 Calculate the linearization point 1 correction value Q2:

$$Q2 = \frac{W1}{L} \times \frac{100\%}{Q0}$$

Note: W1: effective simulate weight applied to the weighing platform, in kg
L: length of the weighing (weighing platform effective), in m
Q0: Rated load (D01), in kg / m.

7.2.5 Enter the linearization points Q1 and Q2 value of point 1:
Call “menu parameters ", select P block parameters (linearization)
Input vale Q2 to P02 (point1 after linearization value)
Input value Q1 to P03 (point1 actual measurement value)

7.2.6 Exit, return to the weighing operation interface.

7.2.7 To continue correcting other nonlinear points, repeat steps 1-6.
Note: linearization from a start point1, the later check point calibration weight must be greater than the front check points. If there are some points will pass the calibration, these points must set the linearization and measurement value above 500%, suggest as 1000%, otherwise, there will prompt event S6.

7.3 linearization Correction Using actual Material

7.3.1 Select load percent of the selected point 1, from the height of the material on the belt, you can check the Qr value on the screen.
7.3.2 Follow the condition and operation of the "physical calibration ".
7.3.3 Select many Qr values when the system is in operation, calculate the average value of many Qr values as Q1
7.3.4 Calculate the linearization point1 value Q2.

$$Q2 = Q1\frac{Ws}{Wa}$$

NOTE, Ws: actual weight of material; in kg
Wa: the accumulated weighing values of material, in kg.

7.3.5 Input Q1 and Q2 values
Call "parameter menu” select block P
Input vale Q2 to P02 (point1 after linearization value)
Input value Q1 to P03 (point1 actual measurement value)
7.4.6 To continue correcting other nonlinear points, repeat steps 1 to 5.
Note: If you do multi-point calibration, linearization from a start point1, the later height of material that being applied on the system must be greater than the front check points. If there are some points will pass the calibration, these points must set the linearization and measurement value above 500%, suggest as 1000%.

Secondly, this actual material linearization generally used in belt scale operation, to find out the situation of excessive error of weight, so no need to select the percentage of the load, just use the actual material height value.

8. Service Value

You can check all the parameters during operation. The instrument will record real time values. This will not affect the operation of the system.

8.1 Service Values Items

8.1.1 AD value: XXXXXX.
8.1.2 Tacho input: Tacho1: XXX Hz
8.1.3 Equipment number: F3.0 = B1 XXXX (if set).
8.1.4 Date and time: XX – XX – XX XX: XX.
8.1.5 Relay Out state: DO = 0111001 (1 – connected, 0 – off).
8.1.6 Relay input state: DI = 000 (1 – connected, 0 – off).
8.1.7 Power run time: EL = XXXXh (for monitoring parameter: K01).
8.1.8 Last run time: ED :> 0 = XX.X h.
8.1.9 Belt run time : ED = XX.Xh, (for monitoring parameters K03).
8.1.10 L/C&Rating percent : aw = XX.XX%.
8.1.11 Max belt load : Q MAX = XX.X%.
8.1.12 Min load section: T Q <MIN = XX.X%.
8.1.13 Last tare rating Per: T1: XX–XX–XX XX%.
8.1.14 Simu.out cur.1(IQV): AA = XX.XXX mA, (E01 selected items) .
8.1.15 Simu.out cur.2 (Ctrl): Y_out = XX.XXX mA.
8.1.16 Set val.sim.inp.cur.: SET_IN = XX.XX mA.
8.1.17 Control mete value : SIDE = XX.XX mA.

8.2 Service Value Reading


Call system menu


Select “Service Parameters” menu


Enter. Display the first parameter of the service parameters


Select other parameters


Return to system Menu


Return to Menu of current weighing surface

9. Event Messages

Instrumentation monitors the operation of the system, the left lower part of the screen display the event message. Event display by their priority setting, call the system menu to display the sub-entry event, you can view event file information. Event code consist one letter and one number.

The event information break into four categories, you can choose the right type of events in the corresponding weight parameter set. Weights priority order: alarm, warning1 warning2, ignored. When Alarm happens, the instrument will interrupt the weighing run operation, warning lights flashing. After the exclusion of the fault event, have to restart.

9.1 System Messages Items

9.1.1 System Messages S

S1: Memory Error (parameter Q02).

S2: External stop signal is not released. Instruments in a stopped state (parameter Q09).

S3: System operation time (parameter K03, K04).

S4: Electric meter operation time (parameter K01, K02)

S5: Enter the password is valid, control instruments can still carry out the operation (parameter Q12).

S6: Parameter of block P is set improperly (parameter P12).

S7: Belt cleanup operation starts (parameter R14).

9.1.2 Electrical Messages E

E1: Power Failure (the power for the instrument error, parameter Q01).

E2: GA1 Error (Speed sensor is damaged or disconnected, parameter Q05).

9.1.3 The detection signal information C

C1: weighing sensor fault (parameter Q08).

C2: speed sensor periodic pulse value is too high (parameter Q03).

9.1.4 The maximum value of the information H

H1: flow is greater than IMAX (parameter F05).

H2: belt load greater than QMAX (parameter F10).

H3: belt speed greater than VMAX (parameter F14).

H4: load cell overload (parameter Q10).

H5: actual flow exceeded tolerance (parameter R07).

H6: control output has reached limit values (parameter R08).

9.2 Weighted Choice Of Messages

The weight rating of the events.

Alarm: Event indication, warning lights flashing, stop system;

Warn1: After the incident, must be cleared manually, with record;

Warn 2: After the incident, the elimination event is automatically cleared, no record;

Ignore: No event instructions.

9.3 Message Reading

Call system menu

Select “event info” menu (normally no need for this step)

Enter. Display the first parameter (event name, code and corresponding parameter)

Select other events

Return to system Menu

Return to Menu of current weighing surface

10. Communication Protocol-MODBUS

10.1 Communication Format

When the meter using MODBUS communication protocol, verification using CCITT-16 / N (G (x) = x16 + x15 + x13 +1).

Communication format:

10.1.1 Read data : address (device address) +03 H + xxH (register high address) + xxH (register low address) + xxH (register number high) + xxH (register number low) + CRCH (check high) + CRCL (check low) . device returns : address (device address) +03 H + xxH (number of bytes) + xxH (high byte) + + xxH (low byte) + CRCH (check high) + CRCL (check low) .
Ex.: The total cumulative is 10,000.84 , the integer part into long integer hexadecimal number : 00002710H, 0.84 fractional part is converted to floating point : 3F570A3DH, instrument address is 1, then read the instructions and return the following results:
Reading: 01H 03H 00H 14H 00H 04H 04H 0DH
Device return: 01H 03H 08H 00H 00H 27H 10H 3FH 57H 0AH 3DH 28H 76H

10.1.2 Write data:
1) 10H features : address (device address) +10 H + xxH (register high address) + xxH (register low address) + xxH (register number high) + xxH (register number low) + xxH (total number of bytes) + xxH (high byte) + ... + xxH (low byte) + CRCH (check high) + CRCL (check low) . If after receiving correctly device will return : address (device address) +10 H + xxH (register high address) + xxH (register low address) + xxH (register number high) + xxH (register number low) + CRCH (check high) + CRCL (check low) . As the length of the data is not the same, the transfer principle is: the higher bytes comes first, lower byte comes second
Such as: To set the flow as 100 (float type) , we know the address for flow is 000CH,
100 in 4 -byte characters is expressed as : 42C80000H, the transmission data is as follows :
01H 10H 00H 0CH 00H 02H 04H 42H C8H 00H 00H 66H 7CH
Instrument will return to receive the correct number of registers from the front to the low number and checksum.
01H 10H 00H 0CH 00H 02H 81H CBH
When exceeded or address not in the setting range, when return, get function byte 10H add 80H, from the front to the low number of registers and verification , ex.: setting the flow range is exceeded, the device returns :
01H 90H 00H 0CH 00H 02H 80H 15H

2) 06H features: only supports 2-byte write , address (device address) +06 H + xxH (register high address) + xxH (register low address) + xxH (high byte) + xxH (low byte) + CRCH (check high) + CRCL (check low) . If after receiving the correct instrument will return : address (device address) +06 H + xxH (register high address) + xxH (register low address) + xxH (high byte) + xxH (low byte) + CRCH (check high) + CRCL (check low) .

10.2 Command Operation

10.2.1 Read-only Command

Address	Byte Count	Description
0031	4	Event Warn Message: 0, Alarm H, Alarm M, Alarm L
0033	2	System and relay message: SYS_status DJ_status
0034	4	Batch accumulate Counter Z1(Long integer)
0036	4	Batch accumulate Counter Z1(Float types)
0038	4	Batch accumulate Counter Z2(Long integer)
0040	4	Batch accumulate Counter Z2(Float types)
0042	4	Batch accumulate Counter Z3(Long integer)
0044	4	Batch accumulate Counter Z3(Float type)
0046	4	Batch finished amount (Float type)
0048	4	Batch residual amount (Float type)
0050	4	Current feed rate I (Float type)
0052	4	Current Belt load (Float type)
0054	4	Current Belt speed (Float type)

Note:
1. The accumulate value to represent by 1 long integer and 1 float.
e.g.
SHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL

S: Sign bit
S=0: Positive number S=1: negative number

H: Hexadecimal digits for the integer
L: Hexadecimal digits for the decimal part of 0-0.999999.

Bit Address

Bit	Value	Alarm_H			Alarm_M			Alarm_L			SYS_status		DJ_status	
		Name	function	code	Name	Function	Code	Name	Func-tion	code	Name	Func-tion	Name	Func-tion
7	0				Load cell	Normal		Feed Rate <Imin	NO					
	1					Error	C1		YES	L1				
6	0	External STOP Key	Relea-se		Speed Pulse	Normal		Belt Load< Qmin	NO		Volumetric Mode	weighing	Belt Motor to Start Light relay	Non-output
	1		Non-Rele	S2		Exceed	C2		YES	L2		volumet		output

			ase											
5	0	System run time	Nor mal		Feed Rate> Imax	NO		Belt Speed <Vmin	NO		Speed Test?	NO	Pre-Feeder To start Relay	Non-output
	1		spill	S3		YES	H1		YES	L3		YES		output
4	0	Meter run time	Nor mal		Belt Load >Qmax	NO		Empty To Load cell	NO		Pre-feeder	Stop	output For Relay Error	Non-Output
	1		Spill	S4		YES	H2		YES	L4		Start		Output
3	0	Input password	Inv alid		Belt Speed >Vmax	NO		Power	Normal		Volumetric Synchronous	Stop	Belt Motor Drive The relay	Non-output
	1		valid	S5		YES	H3		Error	E1		Start		output
2	0	Linearization	Right		Over-Load for Load cell	NO		Speed Sensor	Normal		Batch To run	Stop	Relay For alarm	Non-Output
	1		Error	S6		YES	H4		Error	E2		Start		output
1	0	Analog signal Input	Inv alid		Actual Feed Rate Out of tolerance	NO							Belt MAX For Relay output	Non-Output
	1		Valid	S7		YES	H5							output
0	0				Output For Control Up to Limit value	NO							MIN For Relay output	Non-output
	1					YES	H6							output

10.2.1 Read-Write Command

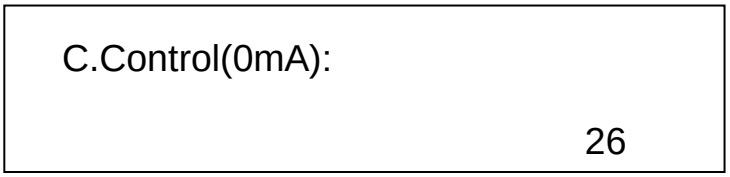
Address	Byte Count	Description
0000	2	Speed mode: 1 external 0 analog
0001	4	Rated Feed Rate (Float type)
0003	2	Belt Cyc. Numb
0004	4	Belt Cyc. Time (Float type)
0006	4	Belt length (Float type)
0008	4	Rang of zero tracking (Float type)
0010	2	Baud rate: 0: 4800, 1: 9600, 2: 19200, 3: 38400
0011	2	Device address IDD
0012	4	Feed Rate Setpoint P (Float type)
0014	4	Batch setpoint Zb (Float type)
0016	4	**P** value setting of PID (0~2) (Float type)(0~2)
0018	4	**I** value setting of PID (0~2) (Float type)(0~2)
0020	4	Totalizing counter (Long integer, setting it to 0 means to clear totalizing counter, setting it to other data is invalid)
0022	4	Totalizing counter Z0 (Float types)
0024	2	Feeder: 1: start, 0: stop
0025	2	Pre-feeder: 1: start, 0: stop
0026	2	Volumetric Mode: 1: start, 0: stop
0027	2	Volumetric Synchronous Mode: 1: start 0: stop
0028	2	Batching Mode: 1: start 0: stop
0029	2	Batch completed symbol: 1: batch completed, 0: clear symbol
0030	2	Number of events,0:clear events

Appendices

The instrument has been done analog input and output standardized calibration in factory. In the use of the site, when the instrumentation connected to PC, PLC or DCS, to avoid numerical difference between the instrument and the current transfer system, you can still re-calibration of the instrument for the current to meet the requirements of field use.

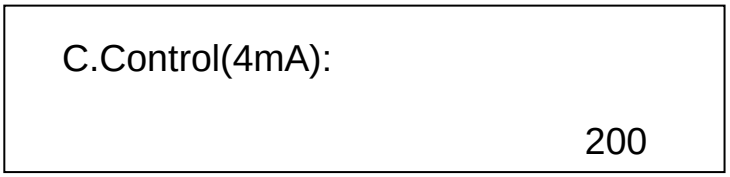
1. Output current calibration

Turn off power, press [▪] till turning on power, when a flash cursor just display on the screen, input 4.0020, meter will display (C.Control (0mA)) on the fist row.

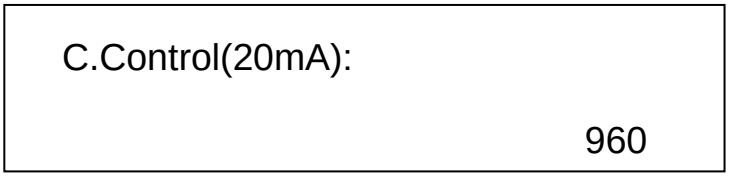


1.1 Control signal of Feeder rate output current checkout:

a. Connect port 11(GND) and port 12 of X9 to current meter, adjust the value of DA (press [⧉] can change the value of DA, press it again will automatic change in the opposite, press [∧] to plus 1, press [∨] to minus 1), make sure the output current approach 0mA most, Press [↵] enter to save, the instrument will display (C.Control (20mA)) on the first row.



b. Adjust the value of DA, make sure the output current approach 4mA most, Press enter to [↵] save, instrument will display (C.A-A(20mA)) on the first row.

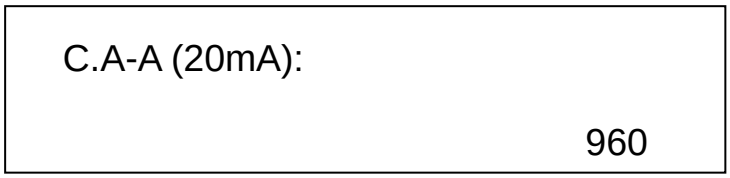


c. Adjust the value of DA, make sure the output current approach 20mA most, press [↵] enter to save, instrument will display (C.A-A(0mA)) on the first row.

1.2 Flux output current checkout:

a. Connect port 9(GND) and port 10 to current meter, adjust the value of DA, make sure the output current approach 0mA most, press [↵] enter to save, instrument will display (C.A-A(20mA)) on the first row.

b. Adjust the value of DA, make sure the output current approach 4mA most, press ↵ enter to save, instrument will display (C.A-A(20mA)) on the first row.

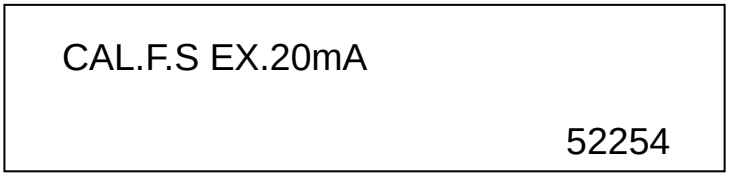


c. Adjust the value of DA, make sure the output current approach 20mA most, press ↵ enter to save, instrument will display Continue? On first row, press ⊠ to exit.

2. Input control current checkouts

Turn off power, press · till turning on power, when a flash cursor just display on the screen, input 4.0021, press ↵ enter to begin flow setting input checkout, instrument will display (CAL.0 EX.4mA) on the fist row.

a. Between port 7 and port 8(GND) input 4mA current, wait until the value of DA that display on the screen is steady, press ↵ enter to save, instrument will display (CAL.F.S EX.20mA) on first row.



b. Between port 7 and port 8(GND) input 20mA current, wait until the value of DA that display on the screen is steady, press ↵ enter to save, instrument will display Continue? On first row, press ⊠ to exit.