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XK3190-C602

Weighing Indicator

User Manual

（**Version 1.03**）

May 2009

Manufactured by Shanghai Yaohua Weighing System Co., Ltd.

MC   No 00000071 Made in Shanghai

XK3190－C602

Content

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Preface

Instruction for use of manual

This manual is for reference by the operators and installers of XK3190-C602 indicator during their operation or installation and testing. Chapter 1 and chapter 2 of this manual introduce the technological features and parameters of the indicator in a general manner. Chapter 3 and chapter 4 describe the installation, parameter setting and calibration methods which can be referred to by installers and repairmen as well as by on-site operators who need to adjust the working modes and parameters of the indicator. Chapter 5 gives out the details of on-site operation methods when the indicator is used to control quantitative scale. Chapter 6 explains the ways and working procedures of the indicator when it is used to control quantitative scale, which can assist installers and operators in understanding the setting of each parameter. Chapter 7 covers the on-site operation methods of indicator when it is used to control catchweigher. Chapter 8 focuses on the ways and working procedures of the indicator when it is used to control catchweigher, which can help installers and operators understand the setting of each parameter. The annexes provide information for error prompt message, communication format, and general problems.

During use of this manual, you may browse it first, and then select the contents related to your current task while omitting the part not concerned. After you have got a general understanding of the indicator, you can read it once again carefully.

The following glossaries are used in the manual:

Parameters are short for configuration parameters. The configuration parameters of quantitative scale include the data setting of timing constant, batching value, and lead, while that of catchweigher includes the data setting of timing constant and catch weight limit. Configuration parameter 2 stands for the second set of parameters. Please note that only【SET 2】parameter can be separately configured as 5 sets, while 【SET 1】 can only have 1 set.

Lead During the feeding of quantitative scale, the weight of material on the load carrier is less

than the weight of material delivered by the feeder since part of the delivered material is still in the air and has not reached to the load carrier. To obtain the predetermined material weight, it is necessary to turn off the feeder in advance. The weight involved in the leading is called a lead. For C602, "self-correction of lead" function can be activated to ensure the accuracy of final weight.

Gradual feed When the feeding to quantitative scale is finished, the material weight is less than the predetermined weight and the difference is beyond the tolerance, the indicator can start slow feeding repeatedly and shortly to make the loaded weight approach to the predetermined value.

Add signal is short for "adding input signal is allowed". Only when the add signal is valid can the C602 output feeding control signal.

Discharge signal is short for "discharge input signal is allowed". Only when discharge signal is valid can C602 output discharge control signal.

Zero zone is the weight limit in additive scale which is used to judge whether the material in hopper is completely discharged.

1. During discharging, it is deemed completed when the indicator shows the gross weight is below zero zone.

2. The indicator can print and totalize only when the material weight is above zero zone.

For catchweigher, the self-control catchweigher can start weighing process only when the weight signal is above zero zone and can print and sum when the calculation result of material weight is above zero zone.

Additive scale is the quantitative scale used for batching control of added material weight in load carrier (like hopper etc), for example, the hopper-type quantitative packing scale.

Subtracting scale is the quantitative scale used for batching control of subtracted material in the load carrier (like hopper). It is also called weight loss scale.

Negative scale is the indicator to measure the weight removed from the load carrier. Subtracting scale works as negative scale during feeding.

Channel is the range of object weight. C602 indicator can be divided into 5 weight ranges, also called 5 channels. Each channel has 1 corresponding switch output signal.

Out-of-tolerance treatment When it is valid and the materials fed by quantitative scale is less than the lower limit of batching value (subtracting tolerance of batching value), while there is no gradual feed function, or when the fed material is more than the upper limit of set value (additive tolerance of batching value), the quantitative scale will stop running, waiting for manual treatment. When the weight meets the tolerance requirement, the quantitative scale will resume the interrupted work.

Peak holding When the catchweigher captures an object weight, it will be displayed until the

weight of next object is captured. The main display or auxiliary display can be selected to show the captured object weight.

Initial zero-setting is the first zero-setting operation after startup. It can be set as automatic zero-setting upon startup (initial) or manual zero-setting. If zero-setting upon startup is prohibited, the indicator maintains the zero point at shutdown. The initial zero-setting range can be selected and generally ±10%Max is set. If the variation of zero point of scale exceeds the initial zero-setting range, initial zero-setting cannot be carried out. The zero-setting range (generally ±2%Max) is based on the zero point determined during initial zero-setting.

Main display The 6-digit 0.56 LED digital tube in upper part of display window and the indicators on both sides are main display of C602 indicator, which is used to display major contents such as weight and set value etc..

Auxiliary display The 6-digit 0.4 LED digital tube in lower part of display window is auxiliary display of C602 indicator, which is used to display accumulative value, summation, date, time, operation procedure etc.. Parameters are prompted during parameter setting and error signal is displayed in case of error prompt.

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Chapter 1 General

The XK3190-C602 weighing indicator adopts Cortex M3 32-bit processor and high-precision Σ-$\triangle$ A/D convertor to carry out conversion display for weight signal. The maximum conversion speed can reach up to 200/s. The display can be easily connected with resistance strain gauge transducer to form batching scale and quantitative packing scale etc., suitable for various applications where high-speed and high-precision weighing control are required.

Major functions and features of XK3190—C602 weighing indicator:

(1) Four optional working procedures of additive scale, subtracting scale, self-control catchweigher and external control catchweigher. The catchweigher can be set as general catchweigher and peak holding scale, with excellent versatility. As quantitative scale and catchweigher, it can store 5 sets of parameters.

(2) AD speed can be set, and digital filtering intensity can also be set.

(3) Save, check, and delete weighing record, with power-off data protection function.

(4) Accurate clock, calendar, automatic leap year and leap month display, not affected by power-off.

(5) Self-control function and various operation error messages.

(6) The standard configuration includes 8 optical isolation switch input, of which 2 channels are used as high speed counting input, encoder input or interrupt (i.e. quick response) input; 8 optical isolation switch output (with external relay box optional). The standard program of indicator can carry out batching value control for two materials.

(7) Expansion is possible for switch value input and output. With the connection of one external IO expansion box, 8 additional switch input and 8 switch output can be provided. 4 IO expansion boxes can be connected in series as a max..

(8) Two independent asynchronous serial communication interfaces, with interface 1 of RS232 and interface 2 of RS232/RS422/RS485 optional. Two communication modes are available: continuous send and command response.

(9) Parallel/serial print interface, available for connection with various printers.

(10) Chinese and English weighing record, accumulative value, parameters or calibration parameters can be printed.

(11) Optical isolation 20mA current loop scoreboard display interface.

(12) 1 optical isolation 4 ~ 20mA/0 ~ 5V/0 ~ 10V analog output (optional).

Chapter 2 Main Parameters

Indicator model	XK3190—C602 weighing indicator
Precision degree	Level 3
Max. verification scale interval	$n_{ind}=3000$
Min. input signal voltage of e verification scale interval	$1\mu V$
Input signal range	3mV～ 15mV
Bridge power of weighing load cell	DC：5V；80mA
Connecting type of weighing load cell	6-wire system, automatic compensation of long wire
Max. cable length of weighing load cell	$100m / 0.5mm^2$ Material: copper
Display	Main display has 6-digit LED digital tube, with character height of 0.56 in. Auxiliary display has 6-digit LED digital tube, with character height of 0.4″ 23 status indicating lamps
Display scale interval	1/2/5/10/20/50 optional $0 \sim 3$ decimal digits
Clock	Yes. To show time and date
Keyboard	Soft push switch is adopted, including 6 buttons.
Max. data memory capacity	8064 weight data or 4032 groups of time + weight data
Scoreboard display interface	Serial output is adopted. 20mA current loop signal can be connected to various sizes of scoreboard display of Shanghai Yaohua Weighing System Co., Ltd.
Communication interface	2 serial RS232C, one of which can be set as RS422/RS485

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	Baud rate 600 ~ 57600bps optional.
Print interface	Parallel output port: to be connected with micro printer, LT800, KX-P1121 or LQ1600K line printers.
	Serial interface: to be connected with serial interface printer
Switch output	8 optical isolation and open collector switch output with max. control voltage ≤30V DC, current ≤100mA, total current of 8 channels ≤200mA
Relay output (with relay box)	Number of relay: 8
	Contact capacity: 220VAC / 28V DC 0.5A
Switch input	8 optical isolation input, input signal +12 ~ +24V DC, the pulse width shall be above 0.2s
	I0 and I1 can be configured as one of four input modes: common input, 2 high-speed counting input, 1 decoder input or 2 interrupt input, the maximum counting frequency of high-speed counting and coder input mode is 10KHz.
Expansion of Switch input and output	Each expansion module has 8 optical isolation input with input signal +12 ~ +24V DC
	8 optical isolation relay output with contact capacity 220V AC/28V DC 0.5A
	The expansion module shall be provided with stable external 12V power supply, with maximum working current of 300mA
	C602 indicator can be connected to 4 switch expansion modules as max..
Analog output	Optical isolation output. It can be set as

	one of three modes 4-20mA / 0-5V / 0-10V.
	Precision degree ≤0.2%FS
	Load capacity:
	4-20mA max. load resistor 250Ω
	0-5V / 0-10V output impedance ≤ 1Ω
Working power supply	110～230V AC；50/60 Hz
Temperature and humidity of working environment	0℃～40℃；≤90％RH
Temperature and humidity of transportation and storage	-20～50℃；≤90％RH
External dimension	Housing: 150 * 75 * 105 (mm) (width * height * depth) Panel: 172 * 93 * 3 (mm) (width * height* thickness) Dimension of installation hole: 152 * 77 (mm)
Weight	About 0.8kg

Chapter 3 Installation, Interface & Communication Format

I. Schematic diagram of front panel and back panel of indicator
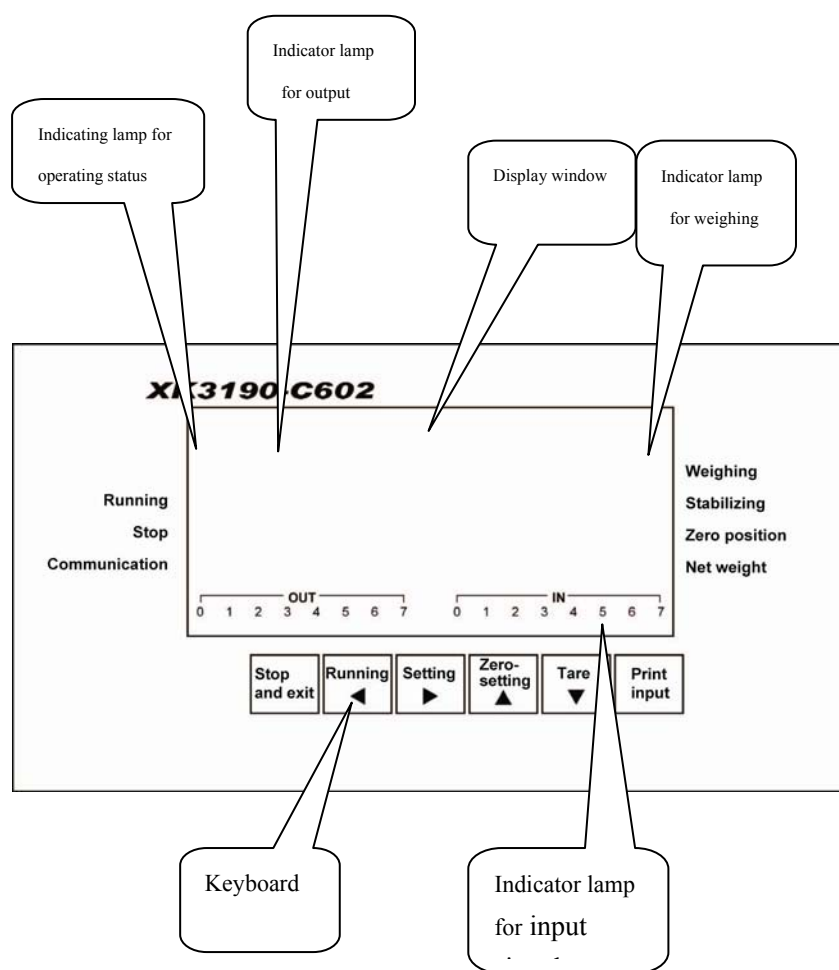
Figure 3－1 Schematic Diagram of Front Panel

Connecting terminal of power

Connecting terminal of switch output

Connection terminal of switch

Connection terminal of analogue output

L N GND
110-230V ～ 50/60Hz
0.2A

+12V O7 O6 O5 O4 O3 O2 O1 O0
200mAmax
OUT
DC 30Vmax/100mAmax

I7 I6 I5 I4 I3 I2 I1 I0 0V
IN
DC +12 ~ +24V

1 2
ANALOG OUT
4-20mA/0-5V/0-10V

Weighing indicator 上海耀华衡器系统有限公司
产品型号 XK3190-C602   电源 AC 110V/230V
准确度等级   3   工作温度 0℃/40℃
检定分度数 n＝3000   相对温度 ≤90 MRH
生产日期 ▮▮▮▮   产品编号 ▮▮▮▮

LOAD CELL
EX+ SEN+ SEN- EX- SIG+ SIG- GND

CAL
EN   DIS

RS-232(1) Scoreboard RS-232(2) RS422/485
GND RxD TxD Busy DP+ DP- RxD TxD TXD0 TXD1 RXD1 RXD0

PRINTER

XK3190-C602

SHANGHAI YAOHUA

Calibration switch

Connecting terminal of

Interface of parallel printer

Connection terminal of weighing load cell
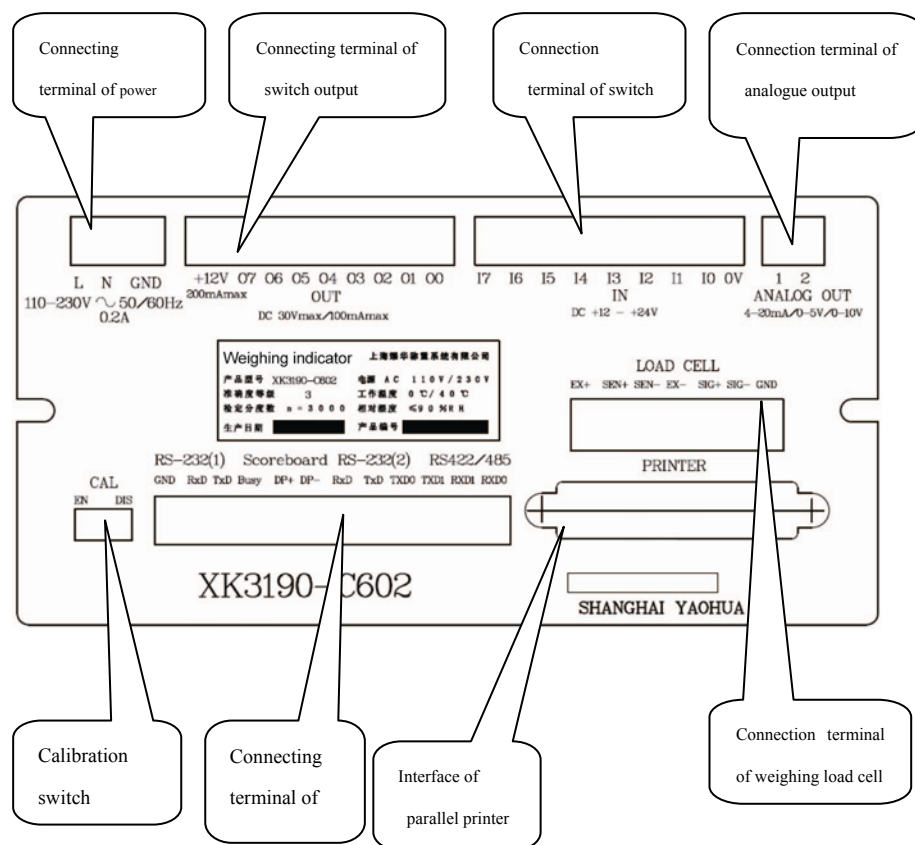
Figure 3－2   Schematic Diagram of Back Panel

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II. Schematic diagram of main panel and power panel

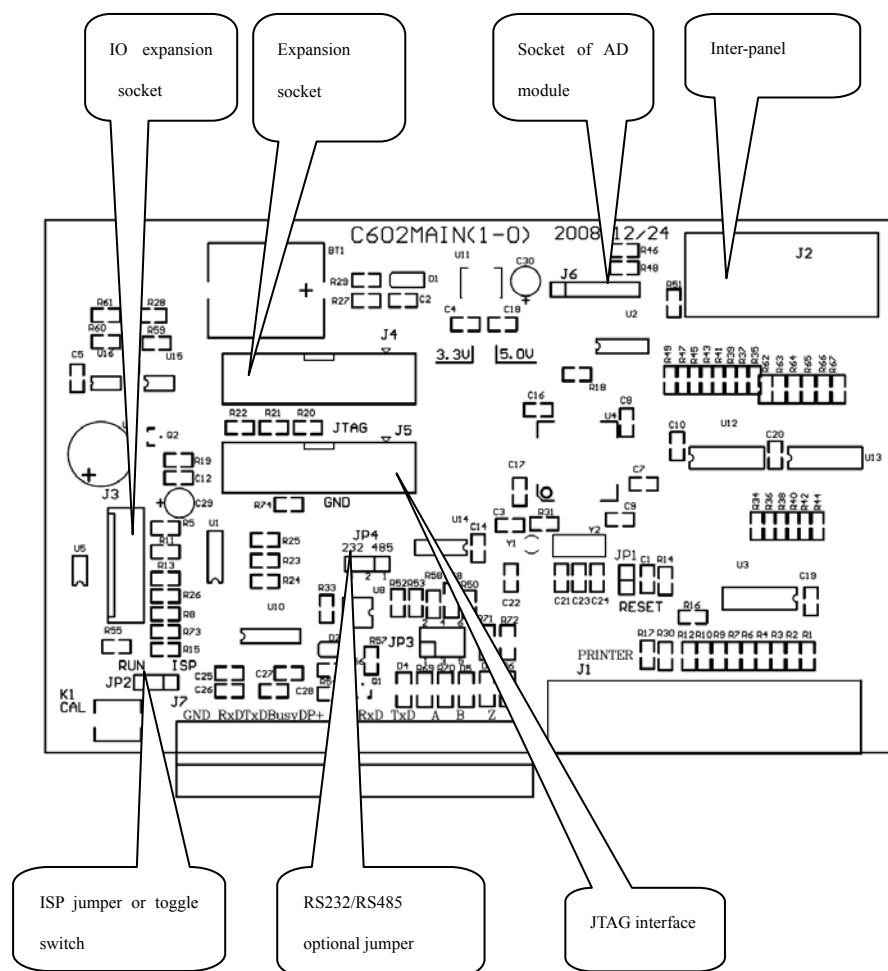Figure 3-3 Schematic Diagram of Main Panel

Inter-panel connector
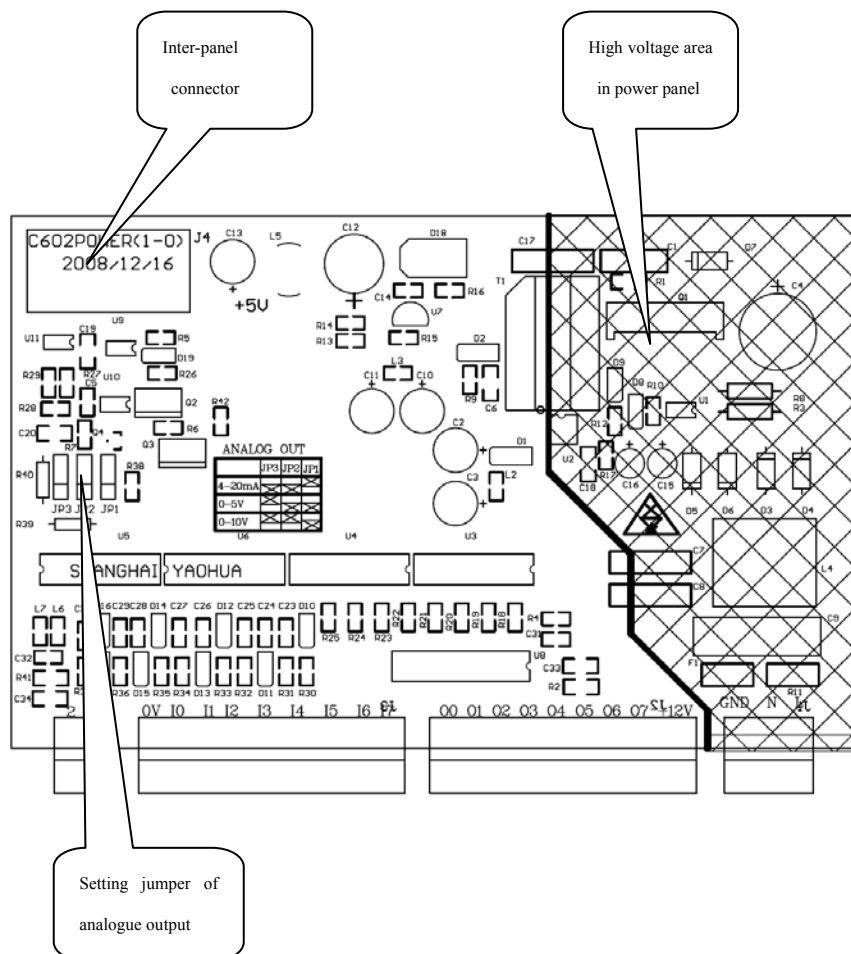
High voltage area in power panel

Setting jumper of analogue output

Figure 3-4 Schematic Diagram of Power Panel

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Attention: the indicator shall have sound and reliable earthing protection so as to ensure the operation stability and safety of operator.

Installation method of indicator

Unscrew two M4 fastening screws on both sides at back of the indicator, remove the binding, insert the indicator into the installation hole, insert the binding again and fasten it with M4 screws.

Disassembly and assembly of indicator

When changing analogue output mode or RS422/RS485 upper and lower resistance or the terminating resistance, the indicator should be opened to adjust the position of corresponding jumper at the main board or power panel. Please carry out the disassembly and assembly of the indicator according to following method to avoid any damage.

Attention: many elements in the indicator are sensitive to static electricity. Please get rid of charge in human body before disassembling the indicator by touching wall or other earthed object so as to protect the indicator against damage by static electricity.

Disassembly method: remove all screws in back panel of indicator, remove the back panel, carefully draw out the upper power panel and the lower main board to adjust corresponding jumper.

Assembly method: carefully insert the main board and power panel into the slots in the housing. When it is about to be fully inserted, and encounters significant resistance, as if blocked by something, at this time, **do not insert it forcedly,** instead, shake the circuit board and carefully insert it. If fails, check whether the contact pin of connector is deformed and whether there is any abnormity in double socket in the display panel. When circuit board is inserted to its place, mount the back panel and fasten all screws. Please note that the screws in the four corners are self-tapping screws and the rest are M3 * 6 SL screws.

III. Connection between load cell and indicator

1. 7-pin electrical male plug are adopted for connection of load cell. Figure 3-5 shows the meanings of each pin.

2. When junction box is used to connect several load cells or extend the cable of load cell, six-wire connecting method must be adopted. When 1 load cell is used and the cable is not extended, four-wire system can be adopted. Under this condition, it is necessary to short connect the EX+ and SEN+ with EX- and SEN- respectively.

3. **The load cell and indicator should be reliably connected and the shielded line of load cell should be reliably connected with GND terminal. The connecting line can not be plugged in and out when the indicator is powered on in order to prevent any damage to the indicator or load cell by static electricity**

4. **The load cell and indicator are both static sensitive equipments, so anti-static measures must be taken during the use. It is strictly forbidden to carry out welding operation or other operations with high current on the weighing platform. In the stormy season, lightening prevention measures must be taken reliably to prevent any damage to load cell and indicator caused by lightening stroke, and to guarantee the personal security of operators and safe running of weighing devices and relative equipments.**


```
          LOAD CELL
EX+SEN+SEN-EX-SIG+SIG-GND
```

In the figure: EX+, EX-: excitation power supply; SEN+, SEN-: excitation feedback; SIG+, SIG-: load cell output signal; GND: shield

Figure 3-5 Connection Diagram of Load cell

IV. Printer interface

1. Parallel printer interface adopts the standard 25-pin D type jack socket. Figure 3-6 shows the meaning of each pin. The indicator can be connected to printer by standard parallel interface printer cable. The 13th pin is +5V output which can be used to connect micro printer with peak current below 2A.
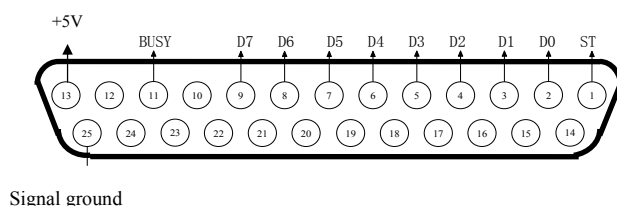

Figure 3-6 Printer Interface

2. Serial printer interface uses the communication interface RS-232 (1). See RS-232 (1) in (Fig. 3-7) for the meaning of each pin. Busy means the printer is busy.

Setting of printer

Correctly set the parameters 7, 8, and 9 (see table 4-3 in chapter four) of 【SET 1】according to the printer model and printing language (Chinese or English). If the printer not listed in the table is to be used, try to select the model with similar printing command format with those listed in the table.

Selection of micro printer

It is suggested to adopt the mirco printer with Chinese library, available for printing at least 16 English charanters in 1 line. When micro printer without Chinese character database is used, only English printing mode is available for selection.

The micro printer shall support the following commands:

Switch to Chinese printing: ESC 8 n (0x1b, 0x38, n)

Reverse printing: ESC C n (0x1b, 0x63, n)

Our company can select the micro printer for customers, which has been verified in the C602.

V. Scoreboard display interface

The scoreboard display interface is the 20mA current loop interface which is capable of driving various scoreboards produced by Yaohua.

Please refer to appendix C for the data format and oscillograph of scoreboard display interface.

```
RS-232(1)  Scoreboard RS-232(2)  RS422/485
GND  RxD TxD Busy  DP+ DP-  RxD  TxD TXD0 TXD1 RXD1 RXD0
```
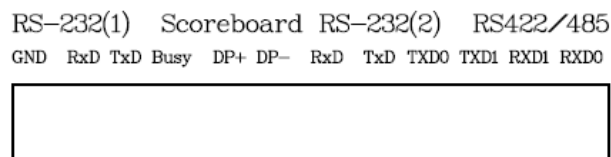
In the figure, DP+ and DP- are the 20mA current loop interface of scoreboard.

Figure 3－7   Serial Communication and Scoreboard Display Interface

VI. Serial communication interface (1)

Serial communication interface (1) is RS232C interface which is capable of transmitting AD switch code or weight data to the PC at high speed, the data rate is equal to AD switching speed. The function of serial interface (1) can be set by 【SET 1】 parameter 6A and its baud rate can be set by 【SET 1】 parameter 5A. Refer to appendix D for data format.

Serial interface (1) can also be used as the drive interface to connect the serial interface printer. The XOFF/XON flow control protocol can be adopted and Busy signal can be used to control the transmission of printing data.

VII. Serial communication interface (2)

Serial communication interface (2) can transmit data to PC as well as receive control command issued by the PC and set parameter. Serial communication (2) can communicate with PC by selecting continuous send or command response. The function of serial interface (2) can be set by 【SET 1】parameter 6B and its baud rate can be set by parameter 5B.

The factory setting of serial communication interface (2) is RS232C, and it can be automatically set as RS422/485 interface. The jumper JP4 chooses different positions based on the selection of RS232 or RS422/484. See figure 3-5 for the connection of communication interface,

in which the right RxD and TxD are RS-232 (2) interface while the TXD0, TXD1, XD0, and RXD1 are RS422/485 interface. Only one of the two can be selected in operation. If terminating resistance and pull-up resistance or pull-down resistance needs to be connected, open the housing, draw out main panel, and short jumper JP3 in main panel. When 1-2 are shorted, the pull-down resistance is valid, when the 3-4 are shorted, terminating resistance is valid, and when 5-6 are shorted, the pull-up resistance is valid. If RS485 communication mode is used, please short TXD0 and RXD0, TXD1 and RXD1 terminals respectively. **Parameter【SET 1】*6B* must select 2.** At this time, the communication interface is working in command response mode to prevent the conflict of bus. The range of common-mode voltage of RS422/RS485 mode is ≤±7V.

1. Continuous send mode

When 【SET 1】 parameter *6B* is set as 1, continuous send mode is active. See table 3-1 for data format. All data are ASCII code, each byte is made up of ten bits, with the first bit as the start bit and the tenth bit as the stop bit, the bits in between are data bits, no check bit is available. The transmitted data are the current weight value (gross weight or net weight) measured by the indicator, each frame has 9 bytes. See table 3-1 for format.

Table 3-1 Communication Format of Continuous Send Mode of Serial Interface (2)

Byte	Content	Explanation
1	G or N	G stands for gross weight while N for net weight.
2	=	Start bit
3	Weighing data	Most significant bit, non-significant zero is represented by space, the same with the following
4	Weighing data	Data or symbol
5	Weighing data	Data or symbol
6	Weighing data	Data or symbol
7	Weighing data	If there are three bits of decimal, this byte is ".".
8	Weighing data	If there are two bits of decimal, this byte is ".".
9	Weighing data	If there is one bit of decimal, this byte is ".".
10	Weighing data	Least significant bit, it is a space if there is no decimal.
11	0x0D	Carriage return

| 12 | 0x0A | Linefeed sign |

For instance, if the indicator measures a gross weight of 50.00 (kg), it will send data as follows:

"G＝   50.00";

If the indicator measures a net weight of －0.040 (kg), it will send data as follows:

"N＝   －0.040".

2. Command response mode

When 【SET 1】 parameter 6*B* is set as 0 or 2, the serial interface 2 works in command response mode. If serial interface 2 works in continuous send mode, when the PC sends correct command to the indicator in command response mode, the indicator will automatically switch to command response mode. If the PC does not send read in EEPROM command, C602 will still work in continuous send mode after next startup. With regard to response mode, the PC sends "setting the communication mode into continuous send mode", the indicator will switch to continuous send mode.

Please refer to appendix E for the communication format of command response mode.

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VIII. Control interface and indicating lamp

See figure 3-8 for optical isolation switching value interface. O0 ~ O7 are the switch output signal terminals for the 8 open collectors, with each terminal absorbs current 100mA at maximum and the total current shall not exceed 200mA. I0 ~ I7 are the 8 Switch input signal terminals. 0V and +12V are the connecting terminals for 12V external isolation power supply, with maximum capacity of power supply of 200mA. The output terminal can be directly connected with the cable terminal of relay box which is supplied with the C602 indicator to transform the output mode of C602 into relay output. The signal input terminal of indicator can connect with +12 ~ +24V voltage as compared with 0V terminal, it can also be shorted with +12V to be effective signal. Attention: the 0V terminal on back panel is isolated from the indicator housing and weighing load cell interface GND terminal. The input and output status indicating lamps on the indicator panel display the actual status of input and output terminals.

```
+12V  O7  O6  O5  O4  O3  O2  O1  O0        I7  I6  I5  I4  I3  I2  I1  I0  0V
200mAmax         OUTPUT                                  INPUT
          DC 30Vmax/100mAmax                         DC +12 ~ +24V
```
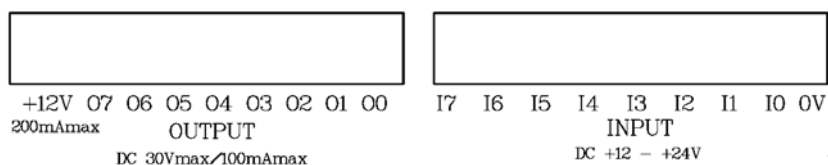
Terminal mark	+12V	O7	O6	O5	O4	O3	O2	O1	O0	I7	I6	I5	I4	I3	I2	I1	I0	0V
Definition of quantitative scale terminal	12Vpower supply positive	Out-of-tolerance	qualified	feeding	Slow feed 2	Quick feed 2	Slow feed 1	Quick feed 1	Zero position	Standby	Discharge signal	Adding signal	Discharge	Feeding	stop	Operation	Standby	12Vpower supply negative

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Definition of catch-weigher terminal		Standby	Standby	Channel 5	Channel 4	Channel 3	Channel 2	Channel 1	Operation	Standby	Standby	Standby	External control	Stop	Operation	Standby	
Corresponding indicating lamp on panel		O7	O6	O5	O4	O3	O2	O1	O0	I7	I6	I5	I4	I3	I2	I1	I0	

Figure 3-8 Switch input and Output Interfaces

Attention: among the input and output terminals, it is prohibited to short 0V terminal and +12V terminal. Or else, severe damage will be done to the indicator.

IX. Analog output

C602 indicator can choose from three Analog output modes: $0 \sim 5V$, $0 \sim 10V$ voltage signal output and $4 \sim 20mA$ current signal output. The current loop is provided by internal power supply and the current signal can be adjusted to $0 \sim 20mA$. The selection of output mode can be done in the jumper JP1 ~ JP3 in power panel, see figure 3-9 for details. In the figure, the jumper position is in conformity with these in power panel and X stands for the position of short circuit ring. The factory setting of current loop is 4-20mA. The output value can be gross weight or net weight by setting 【SET 1】 parameter 1F. The analog output switch is controlled by 【SET 1】 parameter 1E.

Analog output	Jumper selection		
	JP3	JP2	JP1
4—20mA (factory setting)			X
	X	X	
0—5V	X		
		X	X
0—10V	X	X	
			X

Figure 3-9 Setting of Analog Output

Calibration method of Analog output

The zero point value and full range value of analog quantity are proportional to the corresponding DA code (see table 4-3, explanation for【SET 1】 parameter 11 and 12). Calculation and calibration of parameter 11 and 12 can be done by using the tolerance of Analog output.

Attention: in voltage output mode, short circuit of Analog output terminal is strictly prohibited, so does the connection of load of 4-20mA current output. Or else, damage will be caused to the Analog output circuit.

X. Detection of input and output hardware

When the main display is in the display internal code mode (select 1 for parameter A of [*AB*] in 【SET 0】), the detection can be done to check the condition of input and output [DISP] terminals. When I0 input terminal signal is effective, the corresponding O0 will have control signal output. For the same reason, the I1 corresponds to O1……I7 corresponds to O7.

Attention: when external equipment is connected, try to avoid using this method to detect input and output circuit so as to prevent any accident.

Under the displaying status of internal code, the indicating lamp for net weight reflects the working status of ARM single-chip computer oscillator in main panel. When the indicating lamp is on, it means that the external quartz resonator is operating normally while the off status of indicating lamp means that the internal RC oscillator within single-chip computer is working.

Chapter 4 Parameters Setting and Calibration

I. Parameters setting

The indicator has 5 groups of parameters setting condition, which are as follows:

【SET   0】: inquiry parameters;

【SET   1】:general parameters;

【SET   2】: control parameters;

【SET   3】: calibration;

【SET   4】: calibration parameters.

Press 【setting】 button to enter $\begin{bmatrix} & 0 \end{bmatrix}$, press 【↑】or 【↓】to select the parameter group,
[SEt   ]

then press 【input】 button to enter the setting of relevant parameter.

Some setting can go into effect after re-startup and power on.

Attention: when it is necessary to modify the calibrated parameters, the calibration switch shall be turned on. Or else, the modification cannot be carried out and warning "Error 7" will be prompted.

The contents of parameter table 【SET   0】 and【SET   2】 depend on the parameter 13 *A* in parameter table 【SET   1】.

Initialization of parameters

During the calibration process of (【SET   3】), input "123456" (ignore the decimal) while inputting the loaded weight, press 【input】 button, the indicator will carry out initialization of parameters, **all calibration parameters and working parameters will go back to the factory setting. Under normal situation, special attention should be paid when using this function.**

Explanation of button in parameters setting

【←】or 【→】 change the currently flickering digit;

【↑】or 【↓】 modify the value (parameter) of the currently flickering digit;

【esc】 do not save the current modified parameter, go back to the weighing status.

【input 】 if a parameter is modified, pressing this button will save the parameter and enter the

next parameter.

In the following parameters, the italic letters "*ABCDEF*" in "indicator display" represent that the indicator displays the values of parameters *A, B, C, D, E, and F* at the same time. "*", "**", "******", and "**.**.**" represent that it only displays the value of one parameter. The lower line in the indicator display shows the DOS prompt. In the DOS prompt, letter M is displayed as " ⊓ ", and letter W is displayed as " ⊔ ". "【SET 1】 parameter 13*A*" is the parameter *A* in parameter number 13 in table 4-3.

Following is the introduction of parameter according to the group of parameters setting.

【SET 0】 inquiry parameters

Refer to table 4-3 or 4-4 respectively according to the different 【SET 1】 parameters 13*A*:

Table 4-1 【SET 0】 Parameter Table of Quantitative scale

(when 【SET 1】 parameter 13*A* is set as 0 or 1 in table 4-3)

Parameter	Indicator display	Parameter explanation	Remarks
1	[**.**.**] [dAtE]	**Current date setting**	If time or date is modified, it still shows current parameter after pressing 【input】 button, or else, it will go to the next parameter.
2	[**.**.**] [tIME]	**Current time setting**	
3	[******] [n A]	**Accumulated times** *A*—printing option (0: no printing, 1: printing accumulative data, 2: printing all data in memory)	Not to be modified, only for inquiry. When *A* selects 1 or 2, press 【input】 button to start printing, press 【stop】 button to stop printing.

4	[******] [A A]	**Accumulated weight** *A*—printing option (0: no printing, 1: printing accumulative data, 2: printing all data in memory)	The same as the above Display of accumulative weight: when the effective value is above 6 digits, the digits of decimal will automatically reduce. When the integer is above 6 digits, it can only display 6 digits; the number of left decimal points which are lit on represents the number of digits not displayed.
5	[A] [dEL]	**Delete accumulative data and weighing records** (0: no deleting; 1: deleting)	
6	[A] [Light]	**Brightness of display** (0-7)	

Displayed content
A—content in main display

A	0	1	2
Displayed content	Weight	Internal code	AD code

B—content in auxiliary display

B	0	1	2	3	4	5
Displayed content	accumulated times	accumulated weight	Date	Time	Working step note1	Note 1 Note 2

Row 7: [AB] [dISP]

Right column for row 7: Parameter *A* returns to "0" upon each startup. Display of accumulative weight: when the effective value is above 6 digits, the digits of decimal will automatically reduce. When the integer is above 6 digits, it can only display 6 digits; the number of left decimal points which are lit on represents the number of digits not displayed.

Note 1: it displays time in non-operation status.

Note 2: it displays batching value in operation status.

Table 4-1【SET　0】Parameter Table of Catchweigher

(When 【SET　1】 parameter 13*A* selects 2 or 3 in table 4-3)

Para mete r	Indicator display	Parameter explanation	Remarks
1	[**.**.**] [dAtE　]	**Current date setting**	If time or date is modified, it still stops in current parameter after pressing【input】button, or else, it will go to the next parameter.
2	[**.**.**] [tIME　]	**Current time setting**	
3	[　****] [n　　*A*]	**Total accumulative times** *A*—printing option (the same below) (0: no print, 1: print accumulative data, 2: print all data in memory)	Not to be modified, only for inquiry. press【stop】button to stop printing. Press【input】to enter setting of next parameter
4	[******] [A　　*A*]	**Total accumulated weight**	
5	[　****] [n1　*A*]	**Accumulated times of channel 1**	
6	[******] [A1　*A*]	**Accumulated weight of channel 1**	
7	[　****] [n2　*A*]	**Accumulated times of channel 2**	
8	[******] [A2　*A*]	**Accumulated weight of channel 2**	
⋮	⋮	⋮	
13	[　****] [n5　*A*]	**Accumulated times of channel 5**	
14	[******] [A5　*A*]	**Accumulated weight of channel 5**	
15	[　　*A*] [dEL　]	**Delete accumulative data and weighing records** (0: no deleting, 1: deleting)	After pressing 【input】, it will go to setting of next parameter,
16	[　　*A*] [Light]	**Brightness of display** (0-7)	
17	[　　*AB*] [dISP　]	**Displayed content** *A*—content in main display	Parameter *A* returns to "0" upon each startup. Pressing【esc】button

A	0	1	2

ＸＫ３１９０－Ｃ６０２

Displayed content	Weight	Internal code	AD code	can also return to "0" status.
B—content in auxiliary display				Display of accumulative weight: when the effective value is above 6 digits, the decimal digits will automatically reduce. When the integer is above 6 digits, it can only display 6 digits; the number of left decimal points which are lit on represents the number of digits not displayed.
B	0	1	2	3	4	5	
Displayed content	accumulated times	accumulated weight	Date	Time	Working step note 1	Note 1 Note 2	

Note 1: it displays time in non-operation status.

Note 2: it displays the weight of the previous object in operation status.

【SET　1】　general parameters

Table 4-3 Table for Setting of General Parameters

Parameter	Indicator display	Parameter explanation	Remarks
1	[*ABCDEF*] [COMM　]	**Hardware selection** *A*－communication (1) (0:　communication　(1)　OFF,　1: communication (1) ON) *B*－communication (2) (0:　communication　(2)　OFF,　1: communication (2) ON) *C*－scoreboard 　(0: scoreboard 1 OFF: scoreboard ON) *D*－printer (0: printer OFF, 1: printer ON) *E*－analog quantity (0: Analog output OFF, 1: Analog output ON) *F*－display of analog quantity 　(0: net weight, 1: gross weight)	
2	[　*ABCD*] [0 Set]	**Relevant parameters of zero** *A*－zero-setting upon startup (0: off, 1: on) *B*－manual zero-setting range (0 ~ 5) *C*－zero-setting range upon startup (0 ~ 5) *B, C*: 0, 1, 2, 3, 4, 5 Max%: 0, 2, 4, 10, 20, 100 *D*－zero tracking range (0~8) *D*: 0, 1, 2, 3, 4, 5, 6, 7, 8 (e): 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4	
3	[　*ABCD*] [FLt　]	**AD relevant parameters** *A*－filtering algorithm (0: sliding window filter 1: first-order low-pass filter) *B*－AD sampling speed (0 ~ 4) *C*－AD filtering strength　(0 ~ 4) *D*－stable judgment (0 ~ 4) Character: *B*, Meaning: Rate, 0: 25, 1: 50, 2: 60, 3: 100, 4: 200	The larger the value of *B* is, the faster the AD sampling and the lower the stability will be. The larger the value of *C* is, the greater the stability will be, but leading to greater delay. The smaller the value of *D* is, the stricter the stability judgment will be, that's to say, it is more

The sub-tables in Parameter 2:

B, C	0	1	2	3	4	5
Max%	0	2	4	10	20	100

D	0	1	2	3	4	5	6	7	8
(e)	0	0.5	1	1.5	2	2.5	3	3.5	4

The sub-table in Parameter 3:

Character	Meaning	0	1	2	3	4
B	Rate	25	50	60	100	200

		C	Filter	Weak	A little weak	Medium	A little strong	Strong	difficult for the stability indicating lamp to light on when the weight is less stable. When the stability indicating lamp is not on, zero-setting, tare and printing operation cannot be carried out. User can adjust relevant parameter according to actual need.

No.	Code	Description
4	[　　**] [Addr　]	**Indicator communication address** (01 ~ 26) When several indicators communicate with PC through the RS422/485 bus, communication addresses can be used to distinguish them.	

5 — [　　AB] [bAud　]

Communication baud rate (0 ~7)
A-communication interface (1), B-communication interface (2)

A,B	0	1	2	3
BPS	600	1200	2400	4800
A,B	4	5	6	—
BPS	9600	19.2k	57.6k	—

6 — [　　AB] [t Mode]

Communication mode
A-communication interface (1), B-communication interface (2)

A	0	1	2
Communication mode	Continuously send AD code	Continuously send weight	Used as printing interface
B	0	1	2
Communication mode	Command response mode	Continuous send mode	RS485mode

The times of sending data per second by communication interface (1) equal to the AD conversion rate. The sending rate of communication interface (2) in continuous send mode is about 10 times per second. RS485 mode can only be used in command response mode.

7 — [　　A] [Prn　]

Printer model　(0 ~ 4)

A	0	1	2	3	4
Printer model	No printer	Micro printer	LT800 (9 needle)	Panasonic KX-P 1121	EPSON 1600K

The listed printer model is the typical one. Printer with compatible communication protocol can be used.

8	[AB] [PL]	A—selection of printing language (0: English; 1: Chinese) B—printing direction (0: no reverse printing, 1: reverse printing)	Parameter B is only effective for micro printer. As for panel-installed micro printer, selecting reverse printing is easy for checking printing result.
9	[AB] [Auto P]	A—automatic printing (0: no print, 1: automatic print) B—automatic data saving (0: no saving, 1: saving weight, 2: saving time and weight) see note 1	If parameter A is set as 1, the quantitative scale will automatically print the actual discharge quantity each time and the catchweigher will print the weight of material measured each time.
10	[******] [Aout_W]	The corresponding weight at full range of analog output When this weight is reached, the indicator will output analog value at full range.	This value can be larger than the max. weighing value, but the max. output value is the corresponding value at max. weighing. When this value is smaller than the max. weighing value, the full range of analog output will remain unchanged.
11	[******] [Aout_0]	DA internal code (0-20000) at zero point of analog output (output 4-20mA signal about 12520; Output 0-5V/0-10V is 0)	The zero point of calibration analog output of this parameter can be modified.
12	[******] [Aout_F]	DA internal code (10000-65535) at full range of analog output (4-20mA output about 62590; 0-5V/0-10V output about 65200)	The full range value of calibration analog output of this parameter can be modified.
13	[ABC] [type]	A—working mode of the indicator (0: additive scale, 1: subtracting scale, 2: self-control catchweigher, 3: external control catchweigher) B—parameters number (0-4) C—weight unit (0: mg, 1: g, 2: kg, 3: t)	External control catchweigher mode: the indicator will only measure weight upon being activated by external control signal; Self-control catchweigher: the indicator automatically starts weighing when the weight is larger than zero zone value.
14	[A] [Print?]	A-whether to print parameter setting (0: No: 1: Yes)	

Note 1: if parameter 9 *B* is set as 1, while meeting the condition for automatic printing, it will save weight data, with 8064 weighing times as maximum. If 2 is selected, while meeting the condition for automatic printing, it will also save the current time and weight data, with 4032 weighing times and weight data as maximum. If the memory is full, the new data will overlap the earliest ones. When summation is deleted, the recorded data is also deleted. When the setting of parameter 9*B* is changed, the original accumulative data and saved content shall be deleted, or else, error may occur to the weighing record. Weighing record can be either printed or read from communication interface (2).

【SET 2】control parameters

Refer to table 4-4 and 4-5 according to different value of 【SET 1】 parameter 13*A*.

Table 4-4 Parameter 2 of Quantitative Scale

(when 0 or 1 is selected for parameter 13*A* in 【SET 1】 in table 4-3)

Parameter	Indicator display	Parameter explanation	Remarks
1	[*ABC*] [CtrL]	**Batching control parameters** *A*－selection of self-correction of lead (0: no correction, 1: correction) *B* － selection of out-of-tolerance treatment (0: no treatment, continue operation; 1: wait for treatment until it is qualified) *C*－gradual feed for material shortage (0: no gradual feed, 1: gradual feed for material shortage)	
2	[*****] [Pt]	**Cycle index**	Set the cycle index (0 ~ 65535, 0 means indefinite) in the full process from feed to discharge
3	[******] [A1]	**Batching of material 1**	
4	[******] [b1]	**Quick feed lead of material 1**	
5	[******] [C1]	**Slow feed lead of material 1**	
6	[******] [d1]	**Material 1 allowance.**	
7	[******] [A2]	**Additive scale: batching of material 2** **Subtracting scale: weight of feed**	If material 2 is not needed, please set this batching value as zero.
8	[******] [b2]	**Additive scale: quick feed lead of material 2** **Subtracting scale: minimum weight of material in hopper**	
9	[******] [C2]	**Slow feed lead of material 2**	This parameter is useless for subtracting scale
10	[******] [d2]	**Material 2 allowance**	This parameter is useless for subtracting scale

11	[******] [0_Zone]	**Zero zone**	1. The discharge is deemed over when the indicator shows the gross weight is below zero zone. 2. The indicator can print and sum only when the gross weight is above zero zone.
12	[***] [t0]	**Feed measuring delay** (0.0 ～ 25.5 seconds)	Avoid misjudgment of weight caused by the weight impact at startup
13	[***] [t1]	**Measurement delay of quick feed over** (0.0 ～ 25.5 seconds)	When t1 = 0, quick feed and slow quick are activated at same time.
14	[***] [t2]	**Measurement delay of slow feed over** (0.0 ～ 25.5 seconds)	
15	[***] [t3]	**Gradual feed output time** (0.0 ～ 25.5 seconds)	
16	[***] [t4]	**Interval time of gradual feed** (0.0 ～ 25.5 seconds)	
17	[***] [t5]	**Qualified output time** (0.0 ～ 25.5 seconds)	
18	[***] [t6]	**Discharge over delay** (0.0 ～ 25.5 seconds)	
19	[***] [t7]	**Re-feed delay** (0.0 ～ 25.5 seconds)	
20	[A] [Print?]	*A—whether to print parameter setting* (0: no printing: 1: printing)	

Table 4-5 Parameter 2 of Catchweigher

(when 【SET 1】 parameter 13*A* is set as 2 or 3 in table 4-3)

Parameter	Indicator display	Parameter explanation	Remarks
1	[*A*] [CtrL]	*A*—**catchweighing mode** (0: non-peak hold, 1: peak hold)	
2	[******] [A]	**Upper limit of channel 1:** If "zero zone" ≤X＜A, the indicator outputs signal of channel 1 at t3.	Refer to note of parameter 8 for meaning of X. Same for below.
3	[******] [b]	**Upper limit of channel 2:** If A≤X＜b, the indicator outputs signal of channel 2 at t3.	
4	[******] [C]	**Upper limit of channel 3:** If b ≤X＜C, the indicator outputs signal of channel 3 at t3.	
5	[******] [d]	**Upper limit of channel 4:** If C≤X＜d, the indicator outputs signal of channel 4 at t3. If X ≥d, the indicator will output signal of channel 5 at t3.	
6	[******] [0_Zone]	**Zero zone:** 1. After sending catchweighing signal, it will not enter the next cycle until the weight measured by indicator is below this value; 2. Under self-control mode, it will not enter t1 until the weight measured by indicator is above this value. 3. If X is below zero zone, the indicator will not output channel signal at t3.	

7	[***] [t0]	**Judgment delay** (0 ～ 25.5) seconds: Under external control mode, when it is activated, data calculation is started after t0; Under self-control mode, data calculation is started after t0 when weight is out of zero zone.	Please refer to parameter 6 for the definition of "zero zone".
8	[***] [t1]	**Time for calculation of average weight** (0 ～ 25.5) seconds: After t0, the indicator will sum the weight values and figure out the average during time t1. The obtained value serves as catchweighing basis.	Assume that the obtained value is X.
9	[***] [t2]	**Calculation delay** (0 ～ 25.5) seconds: After t1 calculation is over, the indicator remains inactive during t2 time, waiting with delay.	This setting can meet more control site requirements.
10	[***] [t3]	**Time for sending signal** (0 ～ 25.5) seconds: After t2, the indicator sends catchweighing signal with length of t3	Please refer to the explanation of parameter 2 ～ parameter 5.
11	[A] [Print?]	*A*—**whether to print parameter setting** (0: No: 1: Yes)	

II. Calibration

Message: The calibration switch should be opened when the calibration is started, otherwise the calibration status cannot be entered. Before exit by pressing the button [enter], the calibration switch should be closed after completion of calibration; otherwise the auxiliary display will show the message [CALEnd]; It can be quitted by pressing [exit] and

the calibration is valid.

Toggle the switch to 'ON', press the button 【Setting】and press 【↑】or 【↓】repeatedly until
[   ]
[CALIb] is shown. Press 【Input】 and the indicator will show [3] , which means it is
[SEt   ]
the calibration status. Press 【Input】again to start the calibration process. Please see the following

table for the calibration instruction and operation method (* is the original setting value).

Table 4-6 Calibration Setting

Step	Parameter Display	Parameter Instruction	Operation Instruction
1	[*] [dC]	**Decimal Digits**（0-3）	Press 【Input】 after modifying the parameter
2	[*] [e]	**Division**（1/2/5/10/20/50）	Press 【Input】 after modifying the parameter If the decimal digit is not zero, 10, 20, 50 cannot be selected.
3	[******] [F]	**Max. Weighing**	Press 【Input】 after modifying the parameter
4	[A] [CAL 0?]	*A*—**Save the original zero point** 0：Should reconfirm the current zero point; 1：Skip the confirmation of current zero point	Choose 0 to go to step 5; Choose 1 to skip step 5 and go to step 6.
5	[******] [noLoAd]	**The confirmation of zero point** The upper part shows AD code of the indicator	Confirm that the current weighing platform has no load and light is stable ON, then press 【Input】
6	[******] [AdLoAd]	**Load weight** The upper part shows AD code of the indicator	Press 【Input】after the load is finished and the light is stable ON
7	[******] [LoAd]	**Input the current load weight**	Press 【Input】 after changing it to current weight value

| 8 | [******]
[CALEnd
] | **Display current load weight** | The calibration is done and the calibration status is quitted. Toggle the calibration switch to OFF and press【Input】to go back to normal weighing status. |

III. Checking of calibration data

Prompt: The calibration switch should be opened when the calibration data is modified, otherwise it cannot be saved.

Press 【Setting】and 【↓】 to show [4]/[SEt] . Press 【Input】, the indicator will enter the data checking status, please see table 4-7.

Table 4-7 Calibration Data Checking

Parameter	Parameter Display	Parameter Instruction	Operation Instruction
1	[*] [dC]	**Decimal Digits**（0-3）	Press 【Input】after modifying the parameter
2	[**] [e]	**Division（1/2/5/10/20/50）**	Press 【Input】after modifying the parameter If the decimal digit is not zero, 10, 20, 50 can not be selected.
3	[******] [F]	**Max. Weighing**	Press 【Input】after modifying the parameter After modifying the max. weighing
4	[******] [0_Ad]	**Zero AD code**	Press 【Input】after modifying the parameter
5	[******] [bL]	**CAL Coefficient**	Press 【Input】after modifying the parameter
6	[******] [noLine]	**Nonlinear Correction Value**（Note 1） (-1～+1) Unit：%Max	Press 【Input】after modifying the parameter
7	[*] [PZL]	**Tare**	Cannot be modified

8	[******] [0Point]	**Current Zero** (Relative to calibration zero)	Cannot be modified. This parameter reflects the zero stability of weighing load cell.
9	[A] [Print?]	*A*—**Whether to print each parameter** （0：No，1：Yes ）	

Note 1: Nonlinear correction uses the parabola calculation method. The correction value is 1/2 max. weighing position, that is, the correction amount at the top of the correction curve. Nonlinear correction value equals to the negative value of the nonlinear tolerance of 1/2 max. weighing position. The unit of the nonlinear correction value is 1% of the max. weighing value. For example, for the scale whose Max=10kg, if 5kg is added to it and the weight shows 5006g, then the tolerance is +6g, that is , +0.06%Max and the nonlinear correction value is -0.06.

Chapter 5 Operating Instruction of Quantitative Scale

I. Startup and zero setting upon startup

1.   After power is connected, the screen will full display for 10 seconds and show the indicator type and software version, then finally enter the weighing status. If the button 【Exit】 is pressed halfway, then automatic checking will be ended in advance.

 2.   If the setting of 'zero setting upon startup' is valid, the empty scale weight deviates from zero and is still in zero setting scope after startup, the screen will perform zero setting upon startup automatically; If it is not in the zero setting scope, the screen will show the weight based on zero point upon shutting down. Please see the setting of parameter C in parameter 2 of Chapter Parameter Setting $\begin{bmatrix} ABCD \\ 0 \ SEt \end{bmatrix}$ for zero setting scope upon startup.

 3.   If the 'zero setting upon startup' switch is set OFF, the screen will show the weight after startup based on zero point upon shutting down. The operation of【Zero setting】button for the first time will be regarded as the initial zero setting.

II. Manual Zero Setting

     If the display value deviates from zero and is still in the manual zero setting scope while the light is stable ON, press 【Zero setting】 button to get the display value back to zero and zero point lamp will be ON. Please see the setting of parameter B in parameter 2 $\begin{bmatrix} ABCD \\ 0 \ SEt \end{bmatrix}$ of Chapter [SET 1] of parameter setting for manual zero setting scope.

     If it is in net weight status now, press 【Zero setting】 button to change to gross weight display status and press button 【Zero setting】 again to perform zero setting operation.

III. Tare

     Under the weighing status, when the display weight is positive and is stable, press button [Tare] to deduct the display weight, which serves as the tare weight. Then the current display net weight will be 0 and the display light for net weight will be ON.

     The following operations are mentioned in the chapter of parameter setting, it will be described repeatedly in push-button order, which can help to memorize it.

IV. Setting of Date and Time

     【Setting】 → 【Input】（date setting） → 【Input】（time setting） → 【Input】

V. Print

【Print】　　Print the current weight（under non operating, non setting status）.

Remark: Please confirm the parameter setting of the printer type before printing to avoid printing mistake.

VI. Data Query and Removal

Method to Save Weighing Data

Set Parameter B in Parameter 9 $\begin{bmatrix} & AB] \\ [\text{Auto P}] \end{bmatrix}$ of 【SET 1】 as 1, the quantitative scale will automatically save the actual weight of each quantitative cycle. If it is set to 2, then the quantitative scale will automatically save the finishing time and actual weight of each quantitative cycle. The accumulation can't be performed manually.

Inquiry Method

Press【Setting】→【Input】→【Input】→【Input】（inquire the total accumulated times）→【Input】（inquiry the total accumulated weight）. Press button【↓】or【↑】 during the query. If the option at right side of lower line shows '1', press button【Input】to print the accumulated times and accumulated weight. If the option shows '2', press button【Input】to print all weighing records. Press button【Exit】to end printing weighing record halfway.

The communication port（2）of PC can also be used to read the weighing record.

Accumulated Value Removal

Press button 【Input】 after the accumulated value is displayed and the indicator will indicate $\begin{bmatrix} & 0] \\ [\text{dEL} &] \end{bmatrix}$, which means whether to remove the accumulated data. Press button 【↑】→【Input】to clear，and press【Input】directly not to clear.

The communication port（2）of PC can also be used to clear the weighing record.

VII. Operation /Stop

Press the button【Operation】on the indicator panel to start the cycle.

If the button【Stop】 is pressed, the indicator will enter the status of 'pre-stop' and the light of 'stop' and 'operation' will be ON at same time. It will be stopped after the cycle is completed. If the button【Stop】is pressed once again under the status of 'pre-stop', it will enter the 'pause' status. Then the indicator will stop action, all outputs will be shut down and the signal lamp 'function' and 'stop' will all be OFF. If the button【Operation】is pressed again, the indicator will be restored

to the running status and continue its work. If the button 【Stop】is pressed repeatedly, the indicator will be switched over between 'pre-stop' and 'pause'; Press button【Setting】under 'pause' status to enter the status of stop, and the status before 'pause' will not be saved.

The valid signal (i.e. add voltage of 12V~24V or short connected to '+12V') are input to terminal 'function' （I1），'stop'（I2）on the rear panel, which has same function as button 【Operation】or 【Stop】.The signal 'function' and 'stop' will only work at the moment when connected.

Attention: The button【Stop】, input signal 'stop' and its function cannot be used as 'emergent stop' of the system.

VIII. One Time Operation

Input the valid signal (i.e. add voltage of 12V~24V or short connected to '+12V') to the terminal 'material feed' on the rear panel temporarily. The indicator will start to run after the step of material feeding, and material feeding is started after the signal is valid. The indicator will stop running until the material feeding is finished and it will wait for 'discharge' terminal to input the valid signal. After the signal 'material discharging' is valid, the indicator will continue to run. The output control signal （O5）will be valid after the discharge signal is activated. The discharging action will be finished after the .hopper weight is back to zero zone and the indicator will wait for the new 'material feeding' signal. The indicator at these two signal input terminals can be used to realize the synchronized operation with the exterior device or the manually controlled function of the device.

IX. Running after Power Down

If the power is lost during the operation of quantitative scale, C602 will memorize the status of program step before the power loss. The indicator will enter the status of pause after the power supply is back. Press button 【Operation】, the indicator will continue the same work before the power loss (but there will be errors in the weight printing data and weighing record in this cycle). If the work before the power loss needs to be ended, the button【Setting】should be pressed.

X. Buffer Area of Key Command

There is a buffer area of key command with length of 4 in C602. When the key command

with long duration is executed (for example, print the weighing record), the button pressed during the command execution period will be stored in the buffer area of key command. The new key command will be responded only when the current key command is executed.

Chapter 6 Control Process of

Quantitative Scale

I. Additive Scale

Please refer to Fig 6-1 for the function and meaning of setting parameters during the process and the sequence order for controlling the input and output:
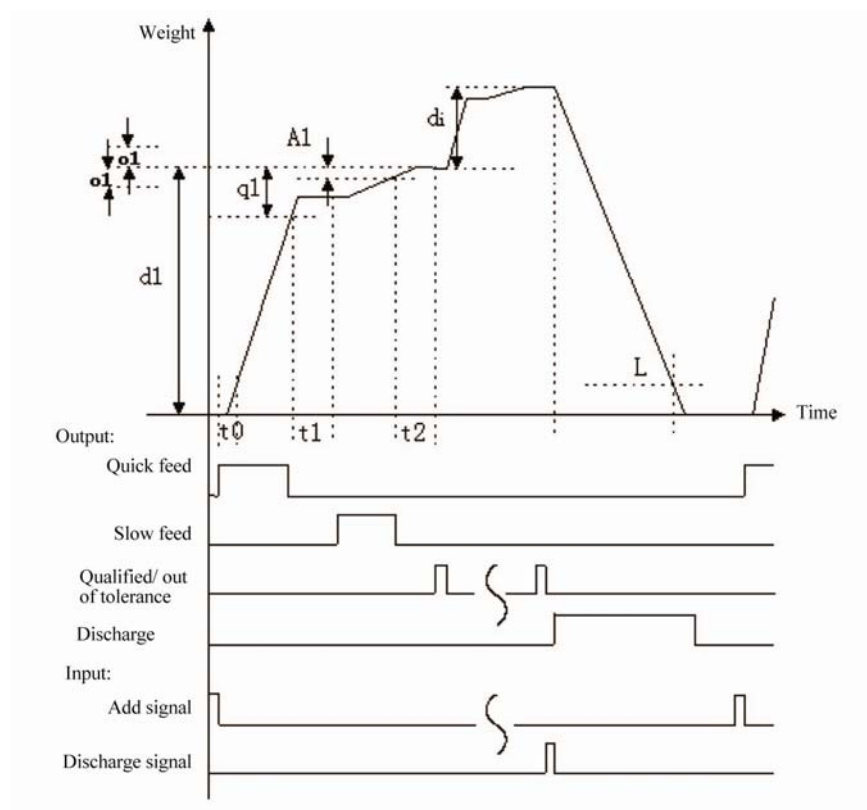
Figure 6-1 Working Sequence Drawing of Additive Quantitative Scale

The parameters instruction in the Figure：t0：Measurement delay of material feed，t1： quick feed over delay，t2： Slow feed over delay (The indicator during the three periods will not judge the weight）； d1: Quantitative value of material 1；q1： Quick feed lead of material 1；a1： Slow feed lead of material；o1： Allowance of material 1；L：Zero zone

Notes to working process of additive quantitative scale:

1. The Add Signal is needed before material feeding;

2. The Discharge Signal is needed during material discharging;

3. The condition that the weight should be less than zero value should be satisfied during the process of closing the material discharging.

4. If the Add Signal and Discharge Signal are always valid, the indicator will automatically execute the procedure repeatedly.

Table 6-2 describes the working process of quantitative scale subtraction by program step.

Display method of program step Set Parameter 7B of 【SET   0】 to 4; under running status, the auxiliary display of the indicator will show the current program step number in forms of 'Step**'.

Table 6-1 Description of Program Step of Additive Quantitative Scale

Program step	Description
1	Wait for stable display light to be ON and Add Signal to be valid; tare is automatically performed, the timer will be T0 and go to program step 2
2	Start quick feed of material 1. If T1 is 0，start the slow feed of material 1 at same time. When T0 is over, weight inspection is started. If the loaded value reaches to batching value of material 1 minus quick feed lead of material 1, turn off quick feed of material 1.The timer will be T1 and go to program step 3.
3	Timing is over, go to program step 4 and the timer is T0
4	Start slow feed of material 1, timing is over and weight inspection is started. If the loaded value reaches to batching value of material 1 minus slow feed lead of material 1, turn off slow feed of material 1.Timer will be T2 and go to program step 5
5	The timing is over. If the lead correction is allowed, modify the slow feed lead of material 1, and go to program step 6.
6	If the material 1 weight is qualified, the qualified signal will be output and it will go to program step 9, the timer will be T5. If it is out of the tolerance, output the out-of-tolerance signal. If the weight is less than the batching value of material 1 minus tolerance

	of material 1 and the gradual feed is allowed, go to program step 7 and the timer will be T3; If the gradual feed is not allowed and the weight is more than the batching value plus tolerance, out-of-tolerance treatment will stop at this step and wait for qualified out-of-tolerance treatment. If the out-of-tolerance treatment is not done, then go to program step 9, the timer will be T5.
7	Start the slow feed of material 1. When timing is over, the slow feed will be closed and timer will be T4, then go to program step 8.
8	Treatment is same as the program step 6
9	If timing is over, the qualified or out-of-tolerance signal will be shut down. If the batching value of material 2 is less than the scale interval, go to program step 19, otherwise, go to program step 10.
10	Wait for the stable display light to be ON and tare to be automatically done, timer will be T0 and go to program step 11.
11	Start the quick feed of material 2. If T0 is 0, start the slow feed of material 2 at same time. When the timing of T0 is over, weight inspection is started. If the loaded value reaches batching value of material 2 minus quick feed lead of material 1, turn off quick feed of material 2. The time will be T1 and go to program step 12.
12	Timing is over, go to program step 13 and the timer is T0.
13	Start the slow feed. The timing is over and weight inspection is started. If the loaded value reaches to batching value of material 1 minus slow feed lead of material 2, turn off slow feed of material 2..Timer will be T2 and go to program step 14.
14	The timing is over. If the lead is allowed to correct, correct the slow feed lead of material2, Go to program step 15.
15	If the material 2 weight is qualified, the qualified signal will be output and it will go to program step 18, the timer will be T5. If it is out of tolerance, output the out-of-tolerance signal. If the weight

	is less than the batching value of material 1 minus tolerance of material 1 and the gradual feed is allowed, go to program step 16 and the timer will be T3; If the gradual feed is not allowed and the weight is more than the batching value plus tolerance, out-of-tolerance treatment will stop at this step and wait for qualified tolerance treatment. If the out-of-tolerance treatment is not done, go to program step 18, the timer will be T5.
16	Start the slow feed of material 2, timing is over, the slow feed will be closed and timer will be T4, go to program step 17.
17	Gradual feed. The disqualification treatment is as same as the program step 6. If it is qualified, go to step 18.
18	Timing is over, close the qualified or out-of-tolerance signal. If material feeding action is started manually, then stop the action; If it is under the status of automatic cycle, then go to program step 19.
19	Perform the automatic print and automatic storage operation according to the setting and go to the program step 20.
20	If there is an Add Signal, go to program step 21.
21	Material discharging. If the weight is back to Zero Zone, go to program step 22 and the timer will be T6.
22	Timing is over and material discharging should be stopped. If the material discharging is started manually, stop the action, otherwise, go to program step 23.
23	Go to program step 24 and the timer will be T7.
24	Timing is over. If the cycle time set is not reached, stop the action. Otherwise go to program step 1 to continue the cycle and the surplus cycle time should be -1.

II. Subtracting scale

Subtracting scale is to control the material (i.e. the material feed) weight discharged by the control hopper. Please refer to Fig 6-2 for the function and the meaning of setting parameters during the process and the sequence order for controlling the input and output:
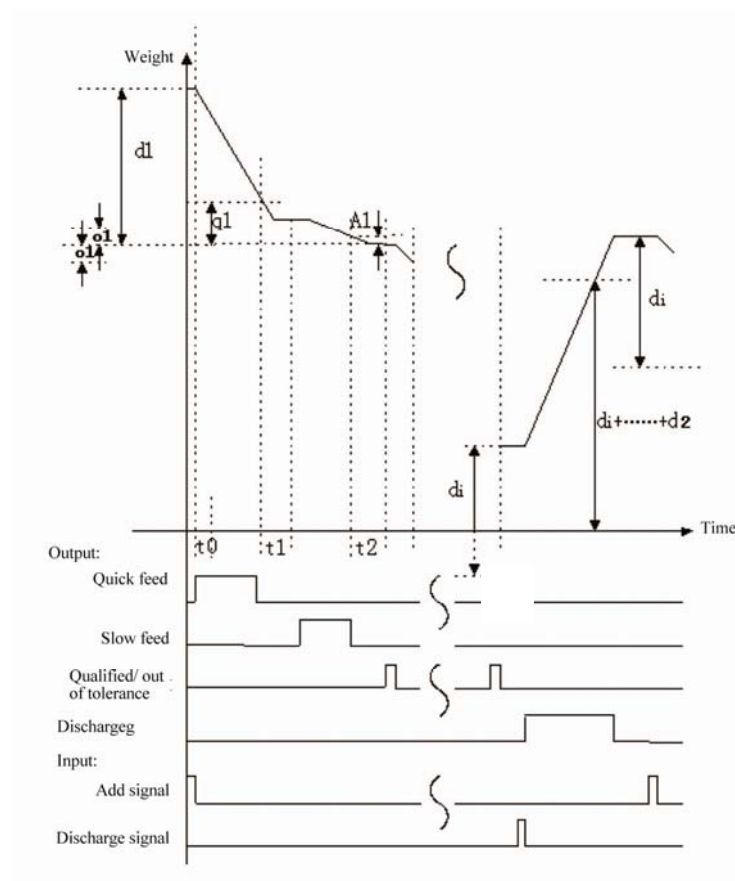
Figure 6-2 Working Sequence Drawing of Subtracting Quantitative Scale

The parameter instruction in the Figure: t_0: Measurement delay of material feed, t_1: Quick feed over delay, t_2: Slow feed over delay (The instrument during the three periods will not judge the weight); d_1: Quantitative value of feed; q_1: Quick feed lead of material 1; a_1: Slow feed lead of material; o_1: Allowance of material ; b_2:Min. remaining weight of material; A_2:Charging weight of material

Note to working process of subtracting quantitative scale:

1. The Add Signal is needed before material feeding;

2. The Discharge Signal is needed during material discharging;

3. If the Add Signal and Discharge Signal are always valid, the indicator will automatically

execute the procedure repeatedly.

4. If the remaining material weight is less than the min. weight (i.e.d1+d2) of one time material feeding weight plus material in the hopper, the instrument will be stopped to do the material feeding and wait for the Add Signal (it means material charging is allowed, that is, feed material to the hopper); The output control signal of material discharging of the instrument will be valid after there is an Add Signal and it will start to judge the weight. If the material weight in the hopper is added to the weight confirmed by the parameter A2, the material discharging will be stopped and the material feeding cycle which is just stopped will continue.

For example: the batching value of material 1 is 50 kg, the batching value of material 2 is 150kg and the min. remaining weight b2 is 20kg. If the remaining weight in the hopper is less than 70 kg when the cycle is started, the material should be added to the hopper up to over150kg to start the material feeding.

Table 6-2 describes the working process of the quantitative scale subtraction by program step.

Display method of program step Set Parameter 7B【SET　0】to 4; under the running status, the auxiliary display of the instrument will show current program step number in the forms of 'Step**'.

Table 6-2 Description of Program Step of Subtracting Quantitative Scale

Program step	Description
1	If the hopper weight is less than the min. material weight plus batching value, go to program step 13. Wait for the stable display light to be ON and the Add Signal to be valid, it will enter the status of negative scale, the timer will be T0 and go to program step 2.
2	Start the quick feed. If T1 is 0, start the slow feed at same time. The timing T0 is over and weight inspection is started. If the loaded value reaches to batching value minus quick feed lead, turn

	off quick feed. The timer will be T1 and go to program step 3.
3	The timing is over, go to program step 4 and the timer will be T0.
4	Start the slow feed; timing is over and weight inspection is started. If the loaded value reaches to batching value minus slow feed lead, turn off slow feed. Timer will be T2 and go to program step 5.
5	The timing is over. If the lead correction is allowed, modify the slow feed lead and go to program step 6.
6	If the weight is qualified, the qualified signal will be output and it will go to program step 9, the timer will be T5. If it is out of the tolerance, output the out-of-tolerance signal. If the weight is less than the batching value minus tolerance and the gradual feed is allowed, go to program step 7 and the timer will be T3; If the gradual feed is not allowed and the weight is more than the batching value plus tolerance, out-of-tolerance treatment will stop at this step and wait for qualified out-of-tolerance treatment. If the out-of-tolerance treatment is not done, then go to program step 9, the timer will be T5.
7	Start the slow feed, timing is over, the slow feed will be closed and timer will be T4. Go to program step 8.
8	Treatment is same as program step 6
9	Timing is over, close the qualified or out-of-tolerance signal. If material feeding action is started manually, then stop the action; If it is under the status of automatic cycle, then go to program step 10.
10	Perform the automatic print and automatic storage operation according to the setting and go to the program step 11.
11	Exit the status of negative scale, go to program step 12 and the timer will be T7.
12	The timing is over. If the cycle time is not reached, go back to

	program step 1. Otherwise stop the action.
13	If there is an Add Signal, go to program step 14.
14	Start the material discharging, add material to the hopper until the allowed weight is reached and go to program step 15.
15	If the material discharging is started manually, then stop the action. Otherwise go to program step 16 and the timer will be T6.
16	Timing is over, go to program step 1 to continue the cycle

Chapter 7 Operation Instruction of Batching scale

I. Power on and Zero Setting upon Start up

1. After power is on, the screen will full display 10 seconds and show the instrument type and software version, then finally enter the weighing status. If the button 【Exit】 is pressed during automatic checking, it will be ended in advance.

2. If the setting of 'zero setting upon startup' is valid, the empty scale weight deviates from zero and is still in the zero setting scope after startup, the screen will execute zero setting upon startup automatically; If it is not in the zero setting scope, the screen will show the weight based on the zero point upon shutting down. Please see the setting of parameter C in parameter 2 $\begin{bmatrix} ABCD \\ 0\ SEt \end{bmatrix}$ of Chapter [SET 1] parameter setting for zero setting scope upon startup.

3. If the 'zero setting upon startup' switch is set OFF, the screen will show the weight based on the zero point upon shutting down after startup. The operation of 【Zero setting】 button for the first time will be regarded as the initial zero setting.

II. Manual Zero Setting

If the display value deviates from zero point and is still in the manual zero setting scope while the light is stable ON, press the button 【Zero setting】 to get the display value back to zero and zero point lamp will be ON. Please see the $\begin{bmatrix} ABCD \\ 0\ SEt \end{bmatrix}$ of parameter B in parameter 2 of Chapter [SET 1] parameter setting for manual zero setting scope.

If it is the net weight status now, press the button 【Zero setting】 to change to gross weight display status and press button 【Zero setting】 again to execute zero setting operation.

III. Tare

Under the weighing status, when the display weight is positive and stable, press button [Tare] to deduct the display weight, which serves as tare weight. Then the current display net weight will be 0 and the display light for net weight will be ON.

The following operations are mentioned in the chapter parameter setting, it will be described repeatedly in push-button order, which can help to memorize it.

IV. Setting of Date and Time

【Setting】→【Input】（date setting）→【Input】（time setting）

V. Printing

【Print】　　Print the current weight（in non-operating, non-setting status）.

Remark: Please confirm the type of printer before printing to avoid printing mistake.

VI. Data Query and Removal

Method to Save Weighing Data

Set Parameter B in Parameter 9 $\begin{bmatrix} & AB \\ \lceil\text{Auto P}\rceil \end{bmatrix}$ of 【SET 1】 to 1, the batching scale will automatically save the actual result of each weighing. If it is set to 2, the batching scale will automatically save every weighing time and actual weight, which cannot be accumulated manually.

Searching Method

【Setting】→【Input】→【Input】→【Input】（search the total accumulated times）→【Input】（search the total accumulated weight）→ 【Input】（search the accumulated times of Channel 1）→【Input】（search the accumulated weight of Channel 1）→【Input】（search the accumulated times of Channel 2）→ 【Input】（search the accumulated weight of Channel 2）……. Press button【↓】or【↑】during the query. If the option at right side of the lower line shows '1', press button【Input】to print the accumulated times and accumulated weights. If the option shows '2', press button【Input】to print all the weighing record.

The serial port（2）of PC can also be used to read the weighing record.

Accumulated Value Removal

Press button 【Input】 after the accumulated value is displayed and the instrument will indicate $\begin{bmatrix} & 0 \\ \lceil\text{dEL} & \rceil \end{bmatrix}$, which means whether to remove the accumulate data. Press button【↑】→【Input】to clear，press【Input】directly not to clear. The communication port（2）of PC can also be used to clear the weighing record.

VII. Operation /Stop

Press the button【Operation】or 【Sop】on the keyboard, the instrument will enter running

status or exit running status. After it is started, O0 will output the running signal to control the function of devices such as conveyer belt.

When the functioning status is entered, any other buttons will not respond except the button 【Stop】.

Add the voltage 12V~24V to the input terminal 'operation' （I1）, 'stop' （I2） on the rear panel or short connect them to the voltage '+12V', which has the same function as the button 【Operation】 or 【Stop】. The signal 'operation' and 'stop' will only work at the valid moment on the rising edge.

Attention: The button 【Stop】 , input signal 'stop' and its function can not be used as the 'emergent stop' of the system.

VIII, Buffer Area of Key Command

There is a buffer area of key command with length of 4 in C602. When the key command with long duration is executed (For example, print the weighing record), the button pressed during the command execution period will be stored in the buffer area of key command. The new key command will be responded only when the current key command is executed.

Chapter 8 Application Examples of Batching scale

I. Self Control Mode

If belt weighing scale is provided at the control site, the user has to choose three different cargoes of different weights through the belt. The weights of these three cargos are respectively 5kg, 10kg and 15kg and it will be delivered through the belt every 10 seconds. The interval for the cargo to be on and off the weighing platform is about 2 seconds and cargo will be remained at the weighing platform for about 4 seconds. We can set the parameter in【SET　2】as follows (suppose that it is 2 decimal digits during calibration)

Table 8-1 Parameter Setting Example of batching scale in Self Control Mode

Set the parameter 13*A of*【SET　1】to 3. The parameter setting of【SET　2】is as follows:

Parameter	Setting	Instruction
1	[0] [CtrL]	Choose the non-peak holding mode.
2	[20] [t0]	The time to load the weighing platform is about 2 seconds.
3	[40] [t1]	The time for remaining on weighing platform is about 4 seconds.
4	[20] [t2]	The time for cargo to be unloaded from weighing platform is about 2 seconds.
5	[20] [t3]	Send the channel signal with interval of 2 seconds
6	[000400] [L]	Other interference can be removed if the zero zone is big
7	[000750] [A]	It is easier to choose if the intermediate value of the two cargos is set.
8	[001250] [b]	It is easier to choose if the intermediate value of the two cargos is set.
9	[001750] [C]	Ensure the third cargo loads on this scope.
10	[999999] [d]	It is suggested to set the unused channel to max. value.

Please refer to Fig 8-1 for the control sequence order:
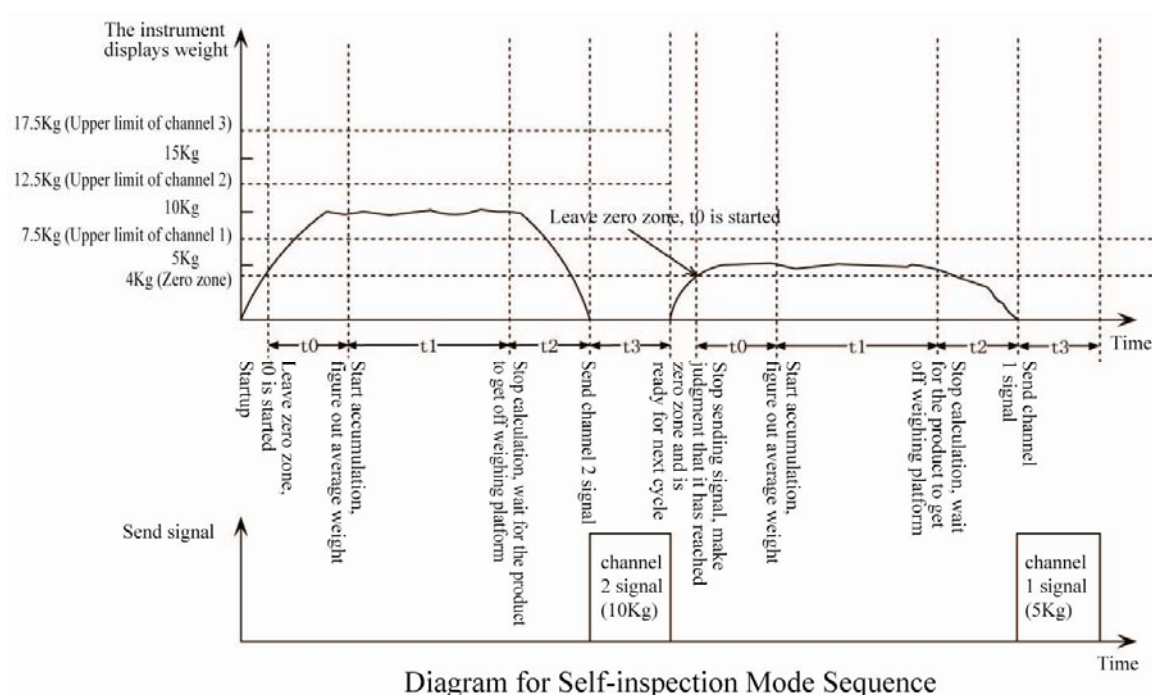
Fig 8-1 Time Sequence of Catchweigher in Self-control Mode

Brief introduction of control procedure of batching scale in self-control mode (Please refer to the sequence order figure):

(1) The instrument starts to run and it will judge whether the weight is higher than zero zone. If it is higher, then enter t0 delay to wait for the cargo to be completely loaded to the weighing platform;

(2) Time t0 is over and the instrument will start to calculate the average weight of cargo with time interval of t1. The value calculated will be the reference for batching scale signal;

(3) Time t1 is over and the instrument will enter the t2 delay to wait for the cargo to leave the weighing platform;

(4) Time t2 is over and the instrument will send the sorted channel signal to make the cargo enter the corresponding channel;

(5) Sending signal is finished and the instrument will judge whether the weight is back to the zero zone again. Only when the zero zone is entered, would the next cycle be started.

Table 6-2 describes the working process of batching scale in self-control mode in forms of the program step.

Display method of program step Set parameter 17B of【SET　0】to 4. Under running status,

the auxiliary display of the instrument will show the current program step number in forms of 'Step**'.

Table 8-2 Description of Program Steps of Self-control Mode

Program Step	Description
1	If the net weight value is more than upper limit of zero zone, go to program step 2 and timer will be T0.
2	Timing T0 is over. Start to calculate the average weight and go to program step 2, timer will be T1.
3	Record the weight data. Timing of T1 is over. Calculate the average weight at the time interval T1 and go to program step 4 and timer will be T2.
4	Timing T2 is over. Save the weight data and sort it by the weight. Output the batching signal by channel and timer will be T3.
5	Timing T3 is over. Close the batching signal. If the weight is back to zero zone, go to program step 1.

II. **External Control mode**

Suppose high speed batching scale is provided at site: Industrial control PLC will combine with the instrument to sort out the cargos quickly. PLC will control the cargo to the weighing platform. A signal will be triggered to the instrument after the cargo is loaded to make the weighing platform calculate the weight. The weight scope of the users' qualified product is 9.90kg ~ 10.10kg and the channel signal, which can be controlled by PLC to deliver to different channels, will be sent according to the weight scope. The time for one cycle is about 3~5 seconds. The instrument should be used together with PLC. We can set the parameter in 【SET　2】 according to table 8-3 (suppose that there are 2 decimal digits during calibration):

Table 8-3 Parameter Setting Example of Batching scale in External Control Mode

Set parameter 13A in 【SET　1】 to 3. Set parameter in 【SET　2】 as follows:

Parameter	Setting	Instruction
1	[　　　1] [CtrL　]	Choose the peak holding mode.
2	[　　02] [t0　　]	The cargo is already on the weighing platform when the triggering signal is received. Long time delay is not required
3	[　　10] [t1　　]	It is enough to take 1 second to calculate the weight.
4	[　　00] [t2　　]	Inform PLC to move the cargo immediately after calculation is finished. Long time delay is not required.
5	[　　10] [t3　　]	Send the channel signal with interval of 1 second and ensure it is received by PLC.
6	[000400] [L　　]	Set zero zone, which should be totally different form the qualified lower limit.
7	[000990] [A　　]	Qualified lower limit
8	[001010] [b　　]	Qualified upper limit
9	[999999] [C　　]	It is suggested to set the unused channel to the max. value.
10	[999999]	It is suggested to set the unused channel

| | [d   ] | to the max. value. |

Please refer to Fig 8-2 for the control sequence order of batching scale in external mode.
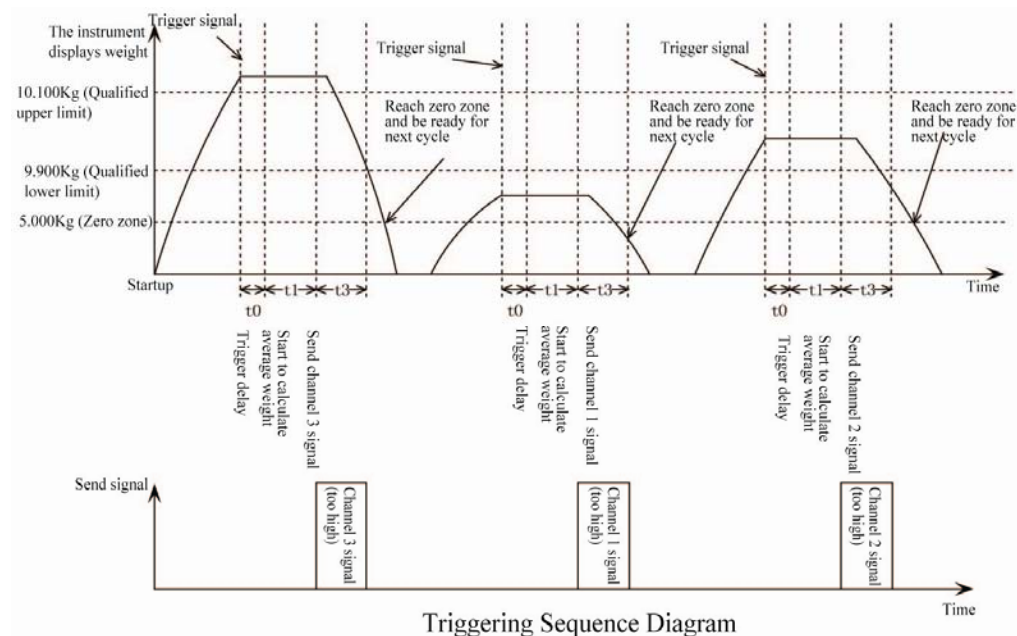
Fig 8-2 Control Sequence Diagram of batching scale in External Control Mode

Brief description of control procedure of the batching scale in external control mode (Please refer to sequence order Fig 8-2):

(1) The instrument is operating and waiting for triggering signal;

(2) The triggering signal arrives; t0 is delayed and waits for the cargo to be stable;

(3) Time t0 is over and the instrument starts to calculate the average weight of the cargos with time interval of t1, which will serve as reference for batching signal;

(4) Time t1 is over. Send the signal to PLC immediately and PLC will remove the cargos according to the signal.

(5) Signal sending is finished and the instrument will judge whether the weight is back to zero zone again. Only when the zero zone is entered, would the next circulation be started.

(6) Table 6-2 describes the functioning process of batching scale in external control mode in forms of program step.

Display method of program step Set Parameter 17B of【SET　0】to 4. Under running status, the auxiliary display of the instrument will show the current program step number in forms of 'Step**'.

Table 8-4 Description of Program Step in External Control Mode

Program Step	Description
1	If the external signal I3 is valid, go to program step 2 and the timer will be T0.
2	Timing T0 is over. Start to calculate the average weight, go to program step 2 and the timer will be T1.
3	Record the weight record. Timing T1 is over; calculate the average weight during the time interval T1, go to program step 4 and the timer will be T2.
4	Timing T2 is over. Save the weight data and sort it by the weight. Output the batching signal by the channel and timer will be T3.
5	Timing T3 is over. Close the batching signal. If the weight is back to zero zone, go to program step 1.

Annex A Error Prompt Message

Table A-1 Error Prompt Message Explanation

Error Prompt Message	Explanation	Handling method
[Error] [1]	Tare requirement is not met.	Tare after getting stable.
[Error] [2]	Requirement of zero-setting is not met.	Set zero after getting stable.
[Error] [3]	Input parameter exceeds allowed range.	Input the parameter correctly.
[Error] [4]	EEPROM Hardware is damaged	Replace U15, U16 on main board
[Error] [5]	Calibration data is wrong, and the parameter is initialized.	Recalibrate and reset all parameters.
[Error] [6]	Printer wire is not connected or printer is faulty. Skip by pressing any key.	Check printer setting or connection condition
[Error] [7]	Calibration switch is not turned on during parameter calibration or calibration parameter modification	Turn on calibration switch before recalibration or calibration parameter modification
[Error] [8]	The loaded weight is too small or loading weight parameter is input wrong during calibration	Weight loaded should be more than 1/5 of max. weighing limit; the weight around weighing limit is better.
[Error] [9]	Batching value is too small, startup fails.	Set quantitative scale parameter correctly
[Error] [10]	Upper limit sequence of batching scale is wrong	Set upper limit sequence of batching scale correctly
[Error] [11]	Zero-setting scope is exceeded, zero-setting fails	Check conditions of load carrier and transducer, or make recalibration
[Error] [12]	Zero-setting scope is exceeded, zero-setting fails	Check conditions of load carrier and transducer, or make recalibration
[Error] [20]	Real time oscillator stopping vibration	Check, replace crystal Y1, capacity C21, C22, resistance R31
[Error]	X=2~9，EEPROM writing is	Check and replace U15 or

[10X]	wrong U15, U16 hardware is damaged or not installed	U16 on main board
[Error] [110]	Error occurs during weighing record saving.	Ditto
[------] [XXXXXX]	Calibration parameter is not appropriate, causing weight indication value exceeding indication scope of indicator	Recalibrate correctly, and set appropriate parameters.
[--Lo--] [XXXXXX]	Gross weight is less than -20e	Execute zero-setting or restart (initialize zero-setting)
[--Hi--] [XXXXXX]	Gross weight is more than max. weighing value +9e	Reduce the load of load carrier

Annex B   Schematic Diagram of Relay Board

Output	O0	O1	O2	O3		O4	O5	O6	O7
Quantitative scale	Zero point	Fast 1	Slow 1	Fast 2		Slow 2	Feed	Eligible	Out-of-tolerance
Catchweigher	Operation	Channel 1	Channel 2	Channel 3		Channel 4	Channel 5	Stand-by	Stand-by
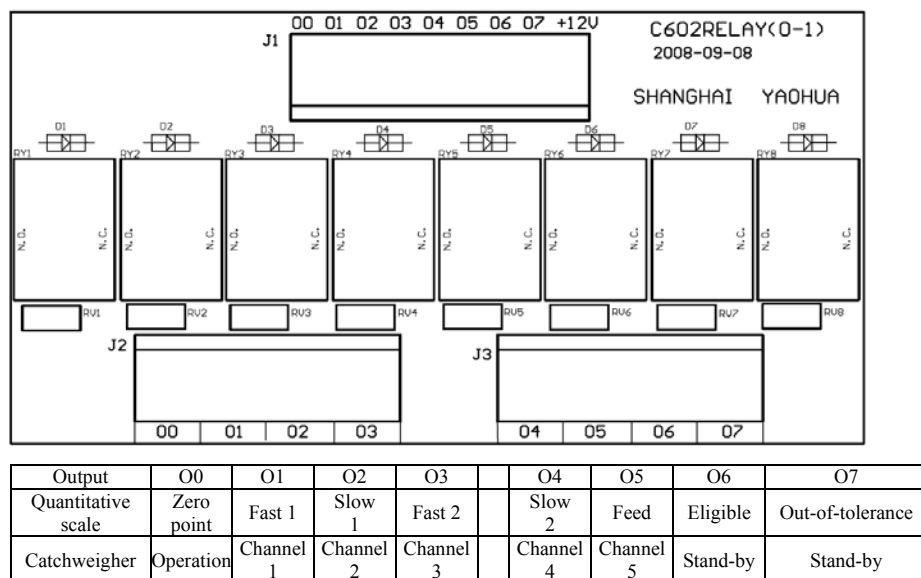
Figure B-1 Definition of Output Function of XK3190-C602 Relay Box

During installation, connect the cable coupled with relay J1 terminal to output terminal block of C602 instrument, i.e. change output signal of C602 instrument transistor to output signal of relay.

The relay is connected with AC powered inductive load, such as AC contactor coil, electromagnetic valve etc., and parallel connected with RC absorption loop on output terminal or load so as to reduce interference, and prolong service life of relay contactor. Thin-film capacitor can be used for the capacitor, electric capacity is about 0.5 time of load current (Ampere), with unit μF, voltage resistance should be more than 3 times of effective value of power supply voltage; resistance value is about 2 times of power supply voltage (V), with unit Ω; the power can be selected with more than two times of calculated power. When the relay is connected with DC powered inductive load, free wheel diode should be parallel connected to the load.

Annex C Large Screen Data Waveform Graph and Format

1. C602 instrument can be connected with all kinds of large screen display produced by Yaohua Company for use.

2. Large screen display interface is provided with 15 core connector assembly, (sharing a socket with serial communication interface), the definition of its pin can be seen in description of pin 9, 10 in Figure 3-4.

3. Scoreboard signal is current loop signal of 20mA constant current, serial output in binary code, with baud rate of 600. Each frame of data has 11 bits, among which there are 1 initial bit (0), 8 data bits (low bit ahead), 1 sign bit, and 1 stop bit (1).

4. C602 transmits a group of data every 100ms, which includes 3 frames of data. Please refer to Figure C-1. The meanings are as follows:

First frame of data: sign bit is 0；

$\quad$ X: d0, d1, d2 are positions of decimal point (0－3);

$\quad$ Y: d3－ is the symbol of weight (1- negative; 0 – positive);

$\quad\quad$ d4－ is gross/net weight (1 – net weight; 0- gross weight);

$\quad$ G18, G17, G16: binary data;

Second frame of data: sign bit is 0;

$\quad$ G15 ~ G8: binary data;

Third frame of data: sign bit is 1;

$\quad$ G7 ~ G0: binary data;

$\quad$ G0 ~ G18: form 19-bit binary code from the lowest to the highest

The first frame:

The second frame:

The third frame:

Oscillograph of Data Frame of Large Screen
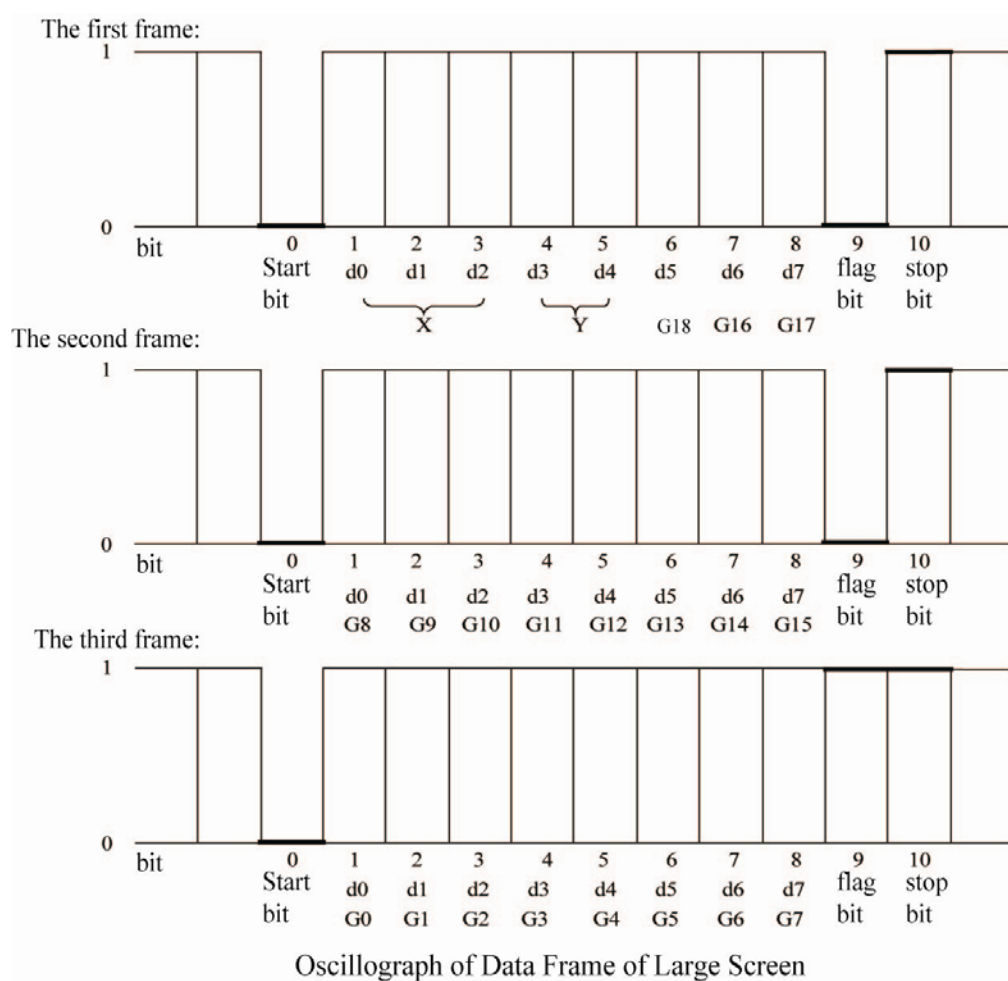
Figure C   Signal Format of Scoreboard   Display Interface

ＸＫ３１９０－Ｃ602

Annex D Data Format of Communication Port (1)

During work mode selection of communication port 1 (setting 1, step parameter), it transmits data to PC once after each time of AD sampling.

Mode 0: transmit AD code continuously

Baud rate of communication should be more than "AD conversion rate * 60", or otherwise unrecognized characters or data loss may occur.

Table D-1 Data Format of AD code

Field	Start signal	Binary AD code (with low bytes ahead)	End signal
Length	1 byte	3 bytes	1 byte
Hexadecimal code	02H	******	03H

Code 1: continuous transmission of weight signal

Baud rate of communication should be more than "AD conversion rate * 120", or otherwise unrecognized characters or data loss may occur.

Table D-2 Weight Data Format

Field	Start signal	Weight data (with high bytes ahead)	New line	End signal
Length	1byte	6bytes	2bytes	1byte
Hexadecimal code	02H	ASC	0DH,0AH	03H

Note: decimal point is omitted during transmission of weight data.

Mode 2：Transmit data to the printer as LPT.

The format is relative to printer type and the format of printing data.

Annex E Data Format of Command-Response Mode of Communication Port (2)

Data format for communication of response mode:

Table E-1 Data Format of Communication

Field	Start signal	Address	Command	NN (optional)	****** (optional)	Check sum	End signal
Length (byte)	1	1	1~2	2	1~12	2	1
Indication form	hexadecimal system	ASCII character	ASCII character	ASCII character	ASCII character	ASCII character	hexadecimal system
Content	02H	A~Z Note: 1	See table D-2	Note: 2	Note：3	Note：4	03H

Note 1：Address of instrument setting is 1~26, the address relative to communication is indicated by A~Z.

Note 2: 2 bytes - parameter codes to be written/read, refer to Note 2~Note 4, Note 8~ Note 11 of table E-2.

Note 3: The length and the format of different parameter value are different. When PC is transmitting numeral character string of parameter, a space can be added to the two ends of it as separating character; numeral character string may include decimal point.

Note 4: The hexadecimal value of XOR check sum from address field to the last byte of parameter 2 indicated by ASCII characters, with higher digits ahead.

It is recommended to use PC software matching to this instrument, which allows very convenient and direct realization of all items of configuration operation.

Please refer to Table E-2 for meanings and communication formats of all orders for communication command, among which address represents the address represented by character A~Z; XH, XL are respectively 4 high bits and four low bits of hexadecimal digits for check sum represented by A~F. In example column, 02H and 03H are respectively start signal and end signal represented in hexadecimal system, the bits between them are ASCII character string, with the last two bits being check sum.

XK3190-C602 communication (2) has eight groups of (non-byte) communication command buffer areas; if all buffer areas are full, later commands may be lost, so continuous command transmission speed of PC should not be too fast.

Table E-2 Communication Command of Order Mode

Command		Meaning	Format	Example (Note 1)
A	Send by PC	Handshake	02H Addr A XH XL 03H	02H AA00 03H

	Send by instrument	Handshake	02H Addr A XH XL 03H	02H AA00 03H
B	sent by PC	Read gross weight	02H Addr B XH XL 03H	02H AB03 03H
	Send by instrument	Send gross weight	02H Addr B ****** XH XL 03H	02H AB ******* 03H
C	Send by PC	Read net weight	02H Addr C XH XL 03H	02H AC02 03H
	Send by instrument	Send gross weight	02H Addr C ****** XH XL 03H	02H AC ******* 03H
D	Send by PC	Read tare weight	02H Addr D XH XL 03H	02H AD05 03H
	Send by instrument	Send tare weight	02H Addr D ****** XH XL 03H	02H AD ******* 03H
E	Send by PC	Tare	02H Addr E XH XL 03H	02H AE04 03H
	Send by instrument	Tare	02H Addr E XH XL 03H	02H AE04 03H
F	Send by PC	Zero-setting	02H Addr F XH XL 03H	02H AF07 03H
	Send by instrument	Zero-setting	02H Addr F XH XL 03H	02H AF07 03H
G	Send by PC	Operate	02H Addr G XH XL 03H	02H AG06 03H
	Send by instrument	Operate	02H Addr G XH XL 03H	02H AG06 03H
H	Send by PC	Stop	02H Addr H XH XL 03H	02H AH09 03H
	Send by instrument	Stop	02H Addr H XH XL 03H	02H AH09 03H the instrument returns to initial state
I	Send by PC	Feed	02H Addr I XH XL 03H	02H AI08 03H
	Send by instrument	Feed	02H Addr I XH XL 03H	02H AI08 03H
J	Send by PC	Discharge	02H Addr J XH XL 03H	02H AJ0B 03H
	Send by instrument	Discharge	02H Addr J XH XL 03H	02H AJ0B 03H
K	Send by PC	Pause/Continue	02H Addr K XH XL 03H	02H AK0A 03H

	Send by instrument	Pause/Continue	02H Addr K XH XL 03H	02H AK0A 03H the instrument enters into pause or running state
L	Send by PC	Accumulate	02H Addr L XH XL 03H	02H AL0D 03H
	Send by instrument	Accumulate	02H Addr L XH XL 03H	02H AL0D 03H
M	Send by PC	Print	02H Addr M XH XL 03H	02H AM0C 03H
	Send by instrument	Print	02H Addr M XH XL 03H	02H AM0C 03H
N	Send by PC	Print accumulation	02H Addr N XH XL 03H	02H AN0F 03H
	Send by instrument	Print accumulation	02H Addr N XH XL 03H	02H AN0F 03H
O	Send by PC	Print working parameter	02H Addr O XH XL 03H	02H AO0E 03H
	Send by instrument	Print working parameter	02H Addr O XH XL 03H	02H AO0E 03H
P	Send by PC	Print calibration parameter	02H Addr P XH XL 03H	02H AP11 03H
	Send by instrument	Print calibration parameter	02H Addr P XH XL 03H	02H AP11 03H
Q	Send by PC	Read calibration parameter	02H Addr Q XH XL 03H	02H AQ10 03H
	Send by instrument	Send calibration parameter	02H Addr Q NN ****** XH XL 03H ……	The instrument returns to all calibration parameters. See note 2 for details.
R	Send by PC	Read working parameter	02H Addr R XH XL 03H	02H AR13 03H
	Send by instrument	Send working parameter	02H Addr R NN ****** XH XL 03 ……	The instrument returns to all calibration parameters. See note 3 for details.
S	Send by PC	Read saving record	02H Addr S NN XH XL 03H	02H AS0012 03H See note 4 for details.
	Send by instrument	Send saving record	02H Addr S NN ****** XH XL 03H ……	The instrument returns to accumulation data or record all data. See note 4 for details

T	Send by PC	Write calibration parameter	02H Addr T NN ****** XH XL 03H	02H AT NN ****** 03H Refer to note 2, note 5.
	Send by instrument	Return to calibration parameter	02H Addr T NN ****** XH XL 03H	02H AT NN ****** 03H （Return to PC command）
U	Send by PC	Write working parameter	02H Addr U NN ****** XH XL 03H	02H AU NN ****** 03H Refer to Note 3，Note 6
	Send by instrument	Return to working parameter	02H Addr U NN ****** XH XL 03H	02H AU NN ****** 03H （Return to PC command）
V	Send by PC	Eliminate stored data	02H Addr V XH XL 03H	02H AV17 03H
	Send by instrument	Eliminate stored data	02H Addr V XH XL 03H	02H AV17 03H
W	Send by PC	Read the date	02H Addr W XH XL 03H	02H AW16 03H
	Send by instrument	Return to the date	02H Addr W ****** XH XL 03H	02H AW05-07-2214 03H
X	Send by PC	Read the time	02H Addr X XH XL 03H	02H AX19 03H
	Send by instrument	Return to the time	02H Addr X ****** XH XL 03H	02H AX17:09:27 33 03H
Y	Send by PC	Write the time	02H Addr Y ****** XH XL 03H	02H AY ******** 03H
	Send by instrument	Return to the time	02H Addr Y ****** XH XL 03H	02H AY ******** 03H
Z	Send by PC	Write the time	02H Addr Z ****** XH XL 03H	02H AZ ******** 03H
	Send by instrument	Return to the time	02H Addr Z ****** XH XL 03H	02H AZ ******** 03H
AA	Send by PC	Select remote control	02H Addr AA ****** XH XL 03H	02H AAA 071 03H Note 7
	Send by instrument	Select remote control	02H Addr AA ****** XH XL 03H	02H AAA 071 03H
AB	Send by PC	Read IO state	02H Addr AB NN XH XL 03H	02H AABI0 03H Note 8
	Send by instrument	Send IO state	02H Addr AB NN ****** XH XL 03H	02H AABI0******** 03H

AC	Send by PC	Send IO state	02H Addr AC NN ****** XH XL 03H	02H AACO0013D 03H Note 9
	Send by instrument	Send IO state	02H Addr AC NN ****** XH XL 03H	02H AACO0013D 03H
AD	Send by PC	Read internal memory state	02H Addr AD NN XH XL 03H	02H AAD J13F 03H Note 10
	Send by instrument	Send internal memory state	02H Addr AD NN ****** XH XL 03H	02H AADJ1******** 03H
AE	Send by PC	Write internal memory	02H Addr AE NN ****** XH XL 03H	02H AAEJ1013F 03H Note 11
	Send by instrument	Send internal memory state	02H Addr AE NN ****** XH XL 03H	02H AAEJ1013F 03H
AF	Send by PC	Read auxiliary display	02H Addr AF XH XL 03H	02H AAF46 03H
	Send by instrument	Send auxiliary display	02H Addr AF ****** XH XL 03H	02H AAF******** 03H Note 12
AG	Send by PC	Read the content of main display	02H Addr AG XH XL 03H	02H AAG46 03H
	Send by instrument	Send the content of main display	02H Addr AG ****** XH XL 03H	02H AAG******** 03H Note 12

Note 1 of Table E-2: Instrument address is supposed to be 1, represented by letter "A". If instrument address is not "1", checksum XH and XL should be changed accordingly. If response character string includes "en" character, it means the format of this command is wrong or execution condition is not satisfied.

Note 2 of Table E-2: The codes of calibration parameter are: e verification scale interval: Dp decimal digit; F maximum capacity; B1 CAL coefficient; 0P zero point AD code; ON current zero point (read only); NL non-linear modification value; AD AD transfer speed; FL filtration strength; Fm filtration calculation method; St stable judgment range; 0T zero point tracking range; 0S zero setting range; 0I initial zero setting scope; EI Switch of zero-setting upon startup; Ut measuring unit. During calibration parameter modification, calibration switch must be turned on. See Table-3 for returned data and explanation.

Table E-3 Explanation of Returned Calibration Data of Instrument

Returned data of instrument	Explanation
AQe 01 54	Scale interval（effective digit） 1 （54 is check sum, same below）
AQDp 3 17	Decimal digit 3
AQF 020.000 7A	Maximum capacity 20kg
AQBl 0067106 28	Standard rate
AQ0P 0262122 67	AD code of calibration zero
AQ0N 000.012 **	Current zero（deviation relevant to calibration

	zero)
AQNL 000.000 1C	Non-linear modification value 0
AQAD 2 27	AD transfer speed 2：60cps
AQFL 2 28	Filtration strength 2
AQFm 1 0A	Filtration method 1
AQSt 2 05	Stable judgment 2
AQ0T 1 45	Zero tracking range 1：0.5e
AQ0S 1 42	Zero setting range 1：
AQ0I 4 5D	Initial zero setting range 4：20%
AQEI 1 2D	Initial zero setting switch 1：on
AQUt 2 03	Weight unit 2：kg

Note 3 of Table E-2: Codes of working parameter: MG instrument working mode; Lt display illumination; ZX main display content; FX auxiliary display content; Ad instrument communication address; Pr printer type; PL printer language; 1C working mode of serial port 1; 2C working mode of serial port 2; 1B baud rate of serial port 1; 2 B serial port 2 baud rate; Ao weight relevant to full measuring range of analog output; FA DA code of full measuring range of analog output; 0A DA code of analog output zero; DA definition of analog output; EA switch of analog output; 1E switch of serial port 1; 2E switch of serial port 2; EP switch of printer; AP automatic printing switch; AM automatic storage ; EB large screen switch; Pf parameters number; 0Z zero area; T0~T7 timing constant T0~T7; P1~P8 batching value, refer to Table E-4. CY cycling times: Tq switch of lead modification; Cc out-of-tolerance treatment switch; Db gradual feed switch; Ff peak value holding switch. Refer to Table E-5 for returned data and explanation

Table E-4 Meanings of Working Parameter Codes P1~P8

Code	Quantitative scale	Catchweigher
P1	A1 batching of material 1	A upper limit of channel 1
P2	B1 quick feed lead of material 1	B upper limit of channel 2
P3	C1 slow feed lead of material 1	C upper limit of channel 3
P4	D1 allowance of material 1	D upper limit of channel 4
P5	A2 batching of material 2	——
P6	B2 quick feed lead of material 2	——
P7	C2 slow feed lead of material 2	——
P8	D2 allowance of material 2	——

Table E-5 Explanation of Returned Setting Parameter Data of Instrument

Returned data of instrument	Explanation
ARMG 2 2B	Equipment type 2: automatic control of catchweigher
ARLt 5 1E	Display illumination 5
ARZX 0 21	Main display content 0: weight
ARFX 4 39	Auxiliary display content 4: work step (operation state)/time (non operation state)
ARAd 01 37	Communication address 01

ARPr 3 02	Printer type 3
ARPL 1 3E	Printing language 1: Chinese
AR1C 1 50	Work mode 1 of serial port 1: send weight continuously
AR2C 2 50	Work mode 2 of serial port 2: RS485 mode
AR1B 4 54	Baud rate 4 of serial port 1: 9600bps
AR2B 4 57	Work mode 4 of serial port 2: 9600bps
ARAo 020.000 31	Relevant weight of full measuring range of analog output 20.000 (kg)
ARFA 65070 20	DA code of full measuring range of analog output
AR0A 00000 52	DA code of analog output zero point
ARDA 0 26	Definition of analog output 0: net weight
AREA 1 26	Switch 1of analog output: on
AR1E 1 56	Switch 1 of serial port 1: on
AR2E 1 55	Switch 1 of serial port 2: on
AREP 1 37	Printer switch 1: on
ARAP 1 33	Automatic printing switch 1: on
AREB 1 25	Large screen switch 1: on
ARAM 2 2D	Automatic storage mode 2: storage time and weight
ARPf 1 14	Batching No. 1
AR0Z 000.010 76	Zero area 0.01 (kg)
ART0 06 71	T0 0.6s
ART1 05 73	T1 0.5s
ART2 05 70	T2 0.5s
ART3 05 71	T3 0.5s
ART4 02 71	T4 0.5s
ART5 02 70	T5 0.5s
ART6 02 73	T6 0.5s
ART7 02 72	T7 0.5s
ARP1 002.000 7E	P1 2.000 (kg)
ARP2 004.010 7A	P2 4.010 (kg)
ARP3 006.020 7A	P3 6.020 (kg)
ARP4 008.020 73	P4 8.020 (kg)
ARP5 003.000 7B	P5 3.000 (kg)
ARP6 001.300 79	P6 1.300 (kg)
ARP7 000.010 7B	P7 0.010 (kg)
ARP8 000.020 77	P8 0.020 (kg)
AUTq 0 21	Allow automatic modification of lead
AUCc 0 24	Allow out-of-tolerance treatment
AUDb 0 22	Allow gradual feed of material shortage
AUFf 1 25	Peak value maintenance

Note 4 of Table E-2: NN=00: read accumulated data, NN=01: read all stored data.

Codes of accumulated data of quantitative scale: Tc total times; Tw total weight. Codes of accumulated data of batching scale: Tc total times; Tw total weight; 1C~5C total times of channel 1 ~ channel 5; 1W~5W total weight of channel 1~ channel 5.

Format of saved data output:

02H, address, command (S), sequence No. (five bytes), space (1 byte), [time (yy/mm/dd/hh:mm:ss) (if there is time data only when 【SET—1】 parameter $9B$ = 2)], weight (7bytes), 0DH, 0AH, 03H.

If there is no data or the data is sent out, return to original command.

Note 5 of Table E-2: Parameter code is same as Note 2. Two ends of data character string are separated by a space respectively, parameter length is limited within 8 characters, parameter value should be in effective range specified in the specifications, or unexpected problem may occur. After all data requiring modification are sent, at last one write command will be sent, which is the command with parameter code WR and without parameter value.

Note 6 of Table E-2: parameter code is same as Note 3, and parameter limitation is same as Note 5. After all data requiring modification are sent, at last one write command will be sent, which is the command with parameter code WR and without parameter value.

Note 7 of Table E-2: the parameter is 1 ASCII character 0, 1 or ?, 1 represents entering remote control state, 0 represents exiting remote control state, ? represents inquiring remote control state. After PC has sent the command of converting to remote control state, if C602 is in stop state, remote control state will be entered; if C602 is in operation state, this command will be omitted; the returned command parameter is 0.

Note 8 of Table E-2: See Table E-6 for the meaning of NN parameter. Parameter value is represented by 3 digits of integer, indicating 8 digits of binary data. 8 digits of binary data of input and output signal state are relevant to all signals. See E-7 for the content of signal light state.

Table E-6 Definition of Parameter of Signal Reading State

Parameter code	Definition
ST	Instrument signal light state
I0	Basic input signal state
I1	Input signal state of the first IO extended module
I2	Input signal state of the second IO extended module
I3	Input signal state of the third IO extended module
I4	Input signal state of the fourth IO extended module
O0	Basic output signal state
O1	Output signal state of the first IO extended module
O2	Output signal state of the second IO extended module
O3	Output signal state of the third IO extended module
O4	Output signal state of the fourth IO extended module

Table E-7 Definition of Character for Signal Light State

Bit	B7	B6	B5	B4	B3	B2	B1	B0
Definition	Remote control	Net weight	Zero point	Stable	Weighing	Communication	Stop	Run

Note 9 of Table E-2: this command is only effective in remote control state, for write output signal. C602 can execute this command at once after receiving it, and change corresponding IO port output state. Parameter code

and data format are same as Note 8 of E-2.

Table E-2 Note 10: The meaning of NN parameter is shown in Table E-8.

Table E-8 Definition of Parameters

Parameter code	Definition
TA~TH	Remaining time of time relay 0 ~ time relay 7; integer of returned 3 bytes of C602 represents calculated value of remaining time. Time unit 100ms, value range 0~255.
JA~JH	States of group 0 to group 7 intermediate relays, 8 intermediate relays for every group. Group 0 is time relay. 8 digits of binary data represented by returned 3 digits of integer of C602 indicate the state of 8 relays.
PA~PZ	26 memories, including integers ranged -8388608~8388607; long integer of returned 8 bytes of C602

Note 11 of Table E-2: this command is only effective in remote control state. Parameter definition is shown in Table E-7. Time relay state can not be written.

Table E-2 Note 12: returned character string is the content of corresponding relay.

Annex F Explanation on Print Format

F.1 Microprint format :

F.1.1 Print current weight

F.1.1 Print current weight

Print in Chinese

```
------------
日期：08/12/07
时间：10:10:31
毛重：010.000 kg
皮重：001.000 kg
净重：009.000 kg
------------
```

Print in English

```
----------------
Date : 08/12/07
Time : 10:10:31
Gross: 010.000kg
Tare : 001.000kg
Net   : 009.000kg
----------------
```

F.1.2 Automatic print format (same for grader and quantitative scale)

Print in Chinese

```
序号   净重（kg）
------------
00001   004.999
00002   005.000
00003   005.000
```

Print in English

```
No.      Net (kg)
------------
00001   004.999
00002   005.000
00003   005.000
```

F.1.3 Accumulated print of quantitative scale

Print in Chinese

```
    累计
------------
日期：08/12/07
时间：15:04:18
次数：00003
总重：0000014.999kg
------------
```

Print in English

```
    Accu
------------
Date:08/12/07
Time:15:04:18
No    :00003
Total 0000014.999kg
------------
```

F.1.4 Accumulated print of grader

Print in Chinese

```
------------
日期：08/12/07
时间：15:04:18
------------
通道 1
次数  00002
总重    0000003.000 kg

通道 2
次数  00002
总重    0000006.000 kg

通道 3
次数  00000
总重    0000000.000 kg

通道 4
次数  00000
总重    0000000.000 kg
```

```
通道 5
次数  00000
总重    0000000.000 kg
------------
总计
次数  00004
总重    0000009.000 kg
```

Note: the accumulated data of various channels are not saved when de-energized, while the total accumulated value is saved, therefore, after being energized, the total accumulated No, total weight and sum of various channels will be inconsistent if the original total value is not cleared.

Print in English

```
--------------
Date:   08/12/07
Time:   15:04:18
--------------
Ch1 :
No: 00002
Tt: 0000003.000 kg

Ch2 :
No: 00002
Tt: 0000006.000 kg

Ch3 :
No: 00000
Tt: 0000000.000 kg

Ch4 :
No: 00000
Tt: 0000000.000 kg

Ch5 :
No: 00000
Tt: 0000000.000 kg
--------------
```

```
SUM :
No: 00004
Tt: 0000009.000 kg
```

F.2 Line printer format

F.2.1 Print current weight

Print in Chinese

日期	时间	毛重 kg	皮重 kg	净重 kg
08/12/07	9:14:43	003.000	000.000	003.000

Print in English

Date	Time	Gross(kg)	Tare(kg)	Net(kg)
08/12/07	9:14:43	003.000	000.000	003.000

F.2.2 Automatic print (same for accumulative scale and grader)

Print in Chinese

称重单		日期：08/12/07	
序号	时间	净重（kg）	总重（kg）
00001	09:04:13	006.000	0000006.000
00002	09:04:24	006.001	0000012.001
00003	09:04:50	006.000	0000018.001

Print in English

Weighing Bill		Date: 08/12/07	
No.	Time	Net (kg)	Total (kg)
00001	09:04:13	006.000	0000006.000
00002	09:04:24	006.001	0000012.001
00003	09:04:50	006.000	0000018.001

F.2.3 Accumulated print of quantitative scale

Print in Chinese

累计

```
------------
日期：08/12/07
时间：15:04:18
次数：00003
总重：0000014.999kg
------------
```

Print in English

```
    Accu
------------
Date:08/12/07
Time:15:04:18
No   :00003
Total 0000014.999kg

------------
```

F.2.4 Accumulated print of catchweigher

Print in Chinese

日期：08/12/08		时间：09:15:28
通道：	次数：	总重：kg
1	00001	0000001.000
2	00002	0000006.000
3	00001	0000005.000
4	00001	0000007.000
5	00001	0000007.999
总计	00006	0000028.999

Print in English

Date :08/12/08		Time: 09:13:25
Chs :	No :	Total : kg
1	00001	0000001.000
2	00002	0000006.000
3	00001	0000005.000
4	00001	0000007.000
5	00001	0000007.999
Total	00006	0000028.999

F.3 Print of calibration parameter and general parameter (same to micro printer and wide line

printer)

There is only English format for parameter print, the explanation is as follows：

Content of print	Explanation
C602 Ver1.00	Instrument type and software version No.
Max=: 020.000kg	Max. capacity 20kg
e= : 01	Scale interval (effective bit) 1
Dp : 03	Decimals 3
0_AD: 00262121	AD code of calibrated zero point
0Point: 000.000kg	Current zero point (corresponding to calibrated zero point)
R : 00067106	Standard rate
Line: 000.000%FS	Non-linear modification value
COMM:111110	Communication setting, corresponding to【SET 1】parameter 1
0_SET 141	Zero-setting，relative to【SET 1】parameter 2
Flt : 1222	Filtration setting, corresponding to【SET 1】parameter 3
Addr: 01	Communication address，corresponding to【SET 1】parameter 4
Buad: 44	Baud rate，corresponding to 【SET 1】parameter 5
Mode: 22	Communication mode, corresponding to【SET 1】parameter 6
Prnt: 1	Printer type, corresponding to【SET 1】parameter 7
PL : 00	Print language, corresponding to【SET 1】parameter 8
AutoP 12	Automatic print, corresponding to 【SET 1】parameter 9
Aout_W 020.000kg	Full measurement range weight of analog output, corresponding to【SET 1】parameter 10
Aout_0 00000	Zero DA code of analog output, corresponding to 【SET 1】parameter 11
Aout_F 65070	Zero DA code of analog output, corresponding to 【SET 1】parameter 12
Type: 212	Equipment type, corresponding to 【SET 1】parameter 13
Disp: 04	Display content, corresponding to 【SET 1】parameter 17
Light: 5	Display brightness, corresponding to【SET 1】parameter 16

F.3.1 Print of Working Parameters of Quantitative Scale

ＸＫ３１９０－Ｃ602

There is only English format for parameter print, with explanation as follows:

Content of print	Explanation
Set NO. 0	Parameters No., corresponding to 【SET 1】 parameter 13*B*
Ctrl: 000	Control setting, corresponding to 【SET 2】 parameter 1
Pt : 00010	Preset cycling times, corresponding to 【SET 2】 parameter 2
A1 : 003.000kg	Batching value of material 1, corresponding to 【SET 2】 parameter 3
B1 : 000.500kg	Quick feed lead of material 1, corresponding to 【SET 2】 parameter 4
C1 : 000.020kg	Slow feed lead of material 1，corresponding to 【SET 2】 parameter 5
D1 : 000.020kg	Tolerance of material 1, corresponding to 【SET 2】 parameter 6
A2 : 003.000kg	Batching value of material 2, corresponding to 【SET 2】 parameter 7
B2 : 000.500kg	Quick feed lead of material 2, corresponding to 【SET 2】 parameter 8
C2 : 000.020kg	Slow feed lead of material 2, corresponding to 【SET 2】 parameter 9
D2 : 000.020kg	Tolerance of material 2, corresponding to 【SET 2】 parameter 10
0_Zone 000.010kg	Zero area setting, corresponding to 【SET 2】 parameter 11
T0 : 0.2 s	Timing 0, corresponding to 【SET 2】 parameter 12
T1 : 0.2 s	Timing 1, corresponding to 【SET 2】 parameter 13
T2 : 0.2 s	Timing 2, corresponding to 【SET 2】 parameter 14
T3 : 0.2 s	Timing 3, corresponding to 【SET 2】 parameter 15
T4 : 0.2 s	Timing 4, corresponding to 【SET 2】 parameter 16
T5 : 0.2 s	Timing 5, corresponding to 【SET 2】 parameter 17
T6 : 0.2 s	Timing 6, corresponding to 【SET 2】 parameter 18
T7 : 0.2 s	Timing 7, corresponding to 【SET 2】 parameter 19

F.3.2 Print of catchweigher working parameter

There is only English format for parameter print, with explanation as follows：

Content of print	Explanation
C602 Ver1.00	Instrument type and software version No.
Pn : 1	Parameters No., corresponding to 【SET 1】 parameter 13B
A : 002.000kg	Upper limit of channel 1, corresponding to【SET 2】 parameter 2
B : 004.000kg	Upper limit of channel 2, corresponding to【SET 2】 parameter 3
C : 006.000kg	Upper limit of channel 3, corresponding to【SET 2】 parameter 4
D : 008.000kg	Upper limit of channel 4, corresponding to【SET 2】 parameter 5
0_Z: 000.010kg	Zero area setting, corresponding to 【SET 2】 parameter 6
T0 : 0.2 s	Timing 0, corresponding to 【SET 2】 parameter 7
T1 : 0.2 s	Timing 1, corresponding to 【SET 2】 parameter 8
T2 : 0.2 s	Timing 2, corresponding to 【SET 2】 parameter 9
T3 : 0.2 s	Timing 3, corresponding to 【SET 2】 parameter 10

Annex G Troubleshooting of General Problems

When the instrument work abnormally, if there is any error prompt, please handle it according to A-1 "Explanation of Error Prompt Information". If the working procedure is abnormal, auxiliary display can be set to work step state (【SET　0】quantitative scale parameter $7B = 4$, catchweigher parameter $17B = 4$), to observe at which step the action stops. Analyze what conditions for entering next step is not met according to description table of relative procedure step, and then execute corresponding adjustment.

Handling methods of general problems are listed in Table G-1.

Table G-1 Troubleshooting of General Problems

Problem	Reason	Handling method
After power-on, the instrument doesn't work, the buzzer doesn't sound.	The power is off JP2 jumper wire on main board is in ISP position.	Check power source Change JP2 jumper wire on main board or turn K2 switch to RUN position
Instrument weighing abnormal	Wiring of transducer is wrong. Incentive power terminal of four-wire connection is not short connected to corresponding incentive feedback terminal. Weighing platform or the transducer has problems. Incentive power load of transducer is too large, making incentive voltage decrease.	Check transducer wiring In case of four-wire connection, EX+ and SEN+ terminal，EX-and SEN- terminals should be short connected. Check whether output signals of weighing platform and transducer are normal The load current of incentive power should not be more than 80mA.
During parameter setting, certain parameters cannot be displayed.	This parameter value is wrong, exceeding display range.	Press 【←】【→】 keys to move flashing position to the parameter, press 【↑】 or 【↓】 to change the parameter.

The instrument cannot enter running state.	Working parameter setting has problems.	Please check whether parameters set are reasonable according to specifications.
Cannot work in accordance with expected steps.	There are problems of parameter setting. The required input signals for running procedure is missed	Ditto Check whether "allow feed", "allow discharge" signals are effective.
Cannot print	Wrong printer settings	Check printer setting parameters and serial port (1) setting parameters
Unrecognized characters occur during printing	Wrong printer settings Poor contact of print cable	Check whether printing setting parameters are conforming to the printer Check printer cable and plug or replace printing cable
Figure flickering	Weighing platform is unstable Weighing platform is vibrating Transducer screening wire is not connected well Electromagnetic inference at site is too large AD shifting speed is too quick Filtration strength is too small	Improve loader structure Adopt measures to reduce weighing platform vibration Connect earthing wire and screening wire well Reduce/decrease electromagnetic inference at site Reduce AD shifting speed (【SET 1】parameter3B) Increase filtration strength (【SET 1】parameter 3C)
Figure response is slow.	AD shifting speed is slow Filtration strength is too large	Increase AD shifting speed (【SET 1】parameter 3B) Reduce filtration strength

		(【SET 1】parameter 3*C*)
Stable light is not ON after figures are stable.	Settings of stability judgment is too small	Increase the value of 【SET 1】parameter 3*D*
Stable light is ON even when the figure is not stable.	Settings of stability judgment is too large	Decrease the value of 【 SET 1 】 parameter 3*D*

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Safety Instructions

In order to guarantee personal safety and property safety of the user, please pay attention to the following points:

1. The system should be well grounded.

2. Yaohua Company is trying to improve product's quality and provide high quality product to the users. However, any electrical equipment may fail, thus during system design, this kind of possibility should be considered, and necessary measures such as redundancy design, interlock device for system reliability and safety improvement should be adopted.

3, Non-professional personnel should not open the instrument to avoid any danger.

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