PA8101BS

WEIGHT INDICATOR

OPERATOR MANUAL

YUYAO PACIFIC WEIGHING ENGINEERING CO.,LTD

Add: NO.50 TanJiaLing East Road Yuyao City, Zhejiang Province P.R. China
Tel : 0086-574-62730153
Fax: 0086-574-62730178
P.C: 315400
http://www.cn-cells.com
E-mail：pacells@mail.nbptt.zj.cn

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Chapter 1: Introduction to the PA8101BS weight indicator

PA8101BS Weight Indicator is a general purpose, industrial grade weight indicator with piece counting operation, custom units, peak hold, and percent mode and weight test features.

Chapter 2: Panel and Connectors

2.1 Front panel see **Fig. 1**, connectors see **Fig. 2**.

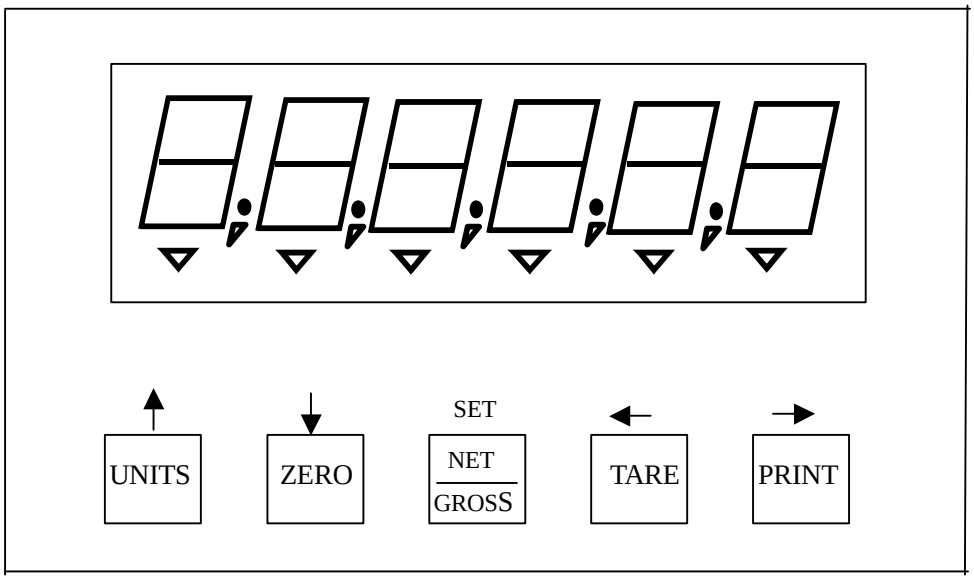


Fig. 1

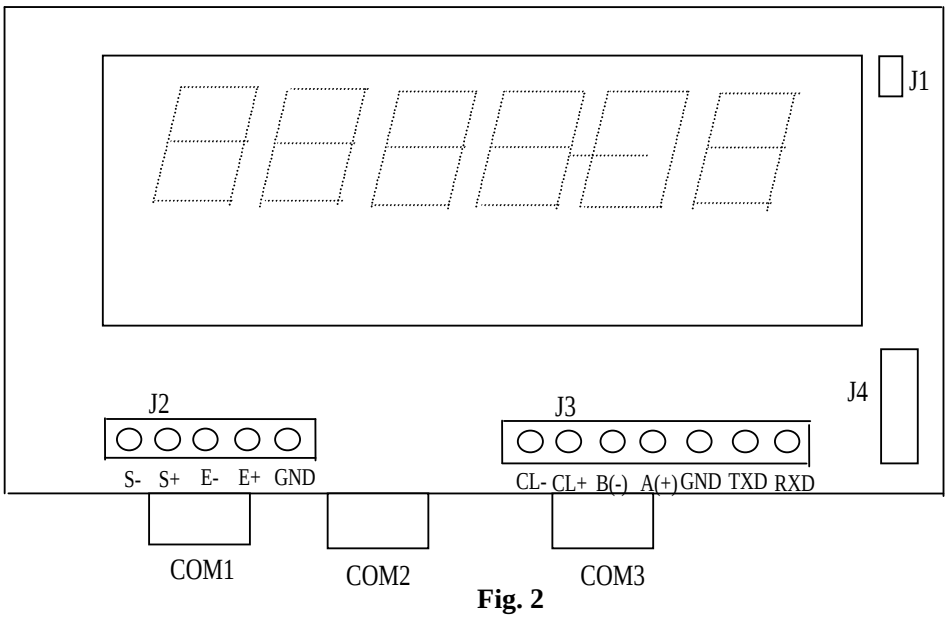


Fig. 2

2.1.1 Front panel

a. 1 inch 6 digits LCD display.
b. 6 LEDs legends.
c. 5 function keys.

2.1.2 Connectors

a. COM1: Load cell connector
b. COM2: RS－232C connector, or RS－485 connector, or 4~20mA current loop connector for remote display.
c. COM3: Power connector

2.1.3 Power

Please see the power layout in Fig. 3. Put the switch to "1" position and press the **[UNITS]** key to turn on the indicator, and then display from 9 to 0. You can select the time for turn off the power automatically in menu F14, if you select "10". The beepers will on several times and turn off the indicator after 10 minutes. You can press the [UNITS] key to re-turn on the indicator. If the voltage of the battery less than 6.1V, the indicator will beep every one second.

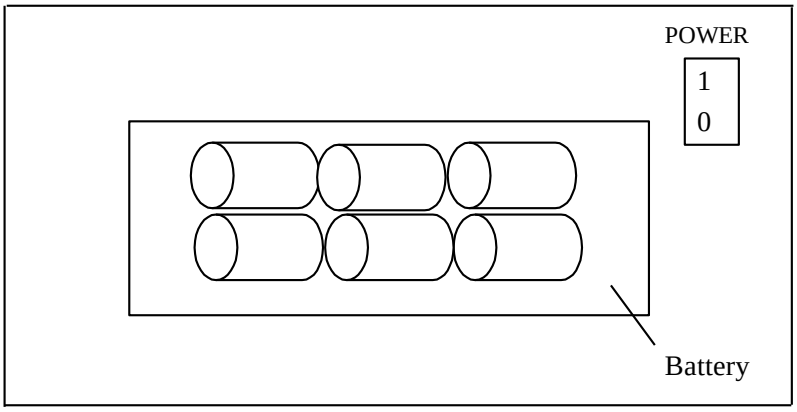


Fig. 3

2.2 Wiring

2.2.1 Wiring for COM1 load cell connector sees Fig. 4

Pin No.	Color	Wire Name
E＋	Red	+ Excitation
E－	Black	- Excitation
S＋	Green	+ Signal
S－	White	- Signal

Fig. 4

2.2.1 Wiring for RS－232C, or RS－485, or current loop connector see Fig. 5.

Pin Nos.	Wire Name
CL+	Current loop output (+)
CL-	Current loop output (-)
B(-)	B(-)
A(+)	A(+)
GND	COM
RXD	RXD
TXD	TXD

Fig. 5

Chapter 3: Function Keys and Annunciator

3.1 Function Keys

[UNITS] — This key toggles the indicator among the available weight units in the Setup "F" menu. The unit will be changed between F9 and F10 if you press this key.

1. The indicator will be in Piece Counting mode when F12＝2, and the "PCS" annunciator will be on at this time if you press the **[UNITS]** key.
2. The indicator will be in Peak Hold mode when F12＝3 if you press the **[UNITS]** key.
3. The indicator will be in Percent Weighing mode when F12＝4, and the "PCS" annunciator will be on at this time if you press the **[UNITS]** key.
4. The indicator will be in Animal weight mode when F12＝6, and there is a "=" sign on the left if you press the **[UNITS]** key.

[ZERO] — This key sets the indicator to display zero provided the following conditions are met:

1. The displayed weight is with the zero reset range.
2. The scale is not in motion.
3. The scale is not in overload.

[NET/GROSS]— This key toggles the indicator between Gross weight and Net weight only if a Tare has been established.

[TARE] — This key is used to establish a Tare provided the following conditions are met:

1. The scale is not at or below Gross zero.
2. The scale is not in motion.
3. The scale is not in overload.

[PRINT] — This key is used to send weight information out to the Printer provided the following conditions are met.

1. The scale is not in motion.
2. The scale is not in overload

3. 2 Annunciators

GROSS: Denotes that the indicator is displaying gross weight.

NET: Denotes that the indicator is displaying net weight.

TARE: Indicates that a tare weight has been established in the system.

ZERO: This light is active whenever the displayed weight is zero.

lb: Indicates that the unit of the displayed weight is "lb".

kg: Indicates that the unit of the displayed weight is "kg".

STABLE: Indicates that the scale is stable.

", , , , , ,": Indicate the "Battery", it is on when the voltage of the battery is very low, beeper will be on 8 times very one second remind you to change the battery.

Chapter 4: Menus

4. 1 The indicator contains two main setup menus: The Setup ("F") menu which configure the indicator to your weight platform and the User ("A") menu which configures the serial communication port and enables some user options. The Setup and User menus consist of several menu selections, each with its own sub-menu of choices.

4. 2 Entering the Setup Menu.

a. Power off the indicator by unplugging the power source.

b. Remove the back cover and locate jumper J1, power on the indicator by plugging the power source. The indicator shows "F 1" to indicate that you are in Setup Menu mode.

4. 3 Exit the setup menu

Put into the jumper J1 switch, and the indicator will enter into the weighing mode after initialization.

4.4 Definition of the keys in the menu mode

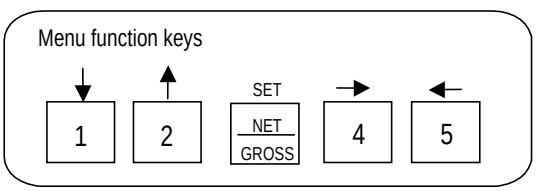
[↑]: Entering to the main menu.

[↓]: Entering to sub-menu from main menu and scroll down the flashing digit 1 from 1 to 9 by press this key at setting the value in sub-menu.

[→]: Entering to right menu in equal class and scroll up the flashing digit 1 from 1 to 9 by press this key at setting the value in sub-menu.

[←]: Entering to left menu in equal class and change the flashing digit from higher to lower.

[set]: Accept displayed data of a selection and return to main menu.



Chapter 5: Setup "F" Menu

5. 1 Setup Menu Chart

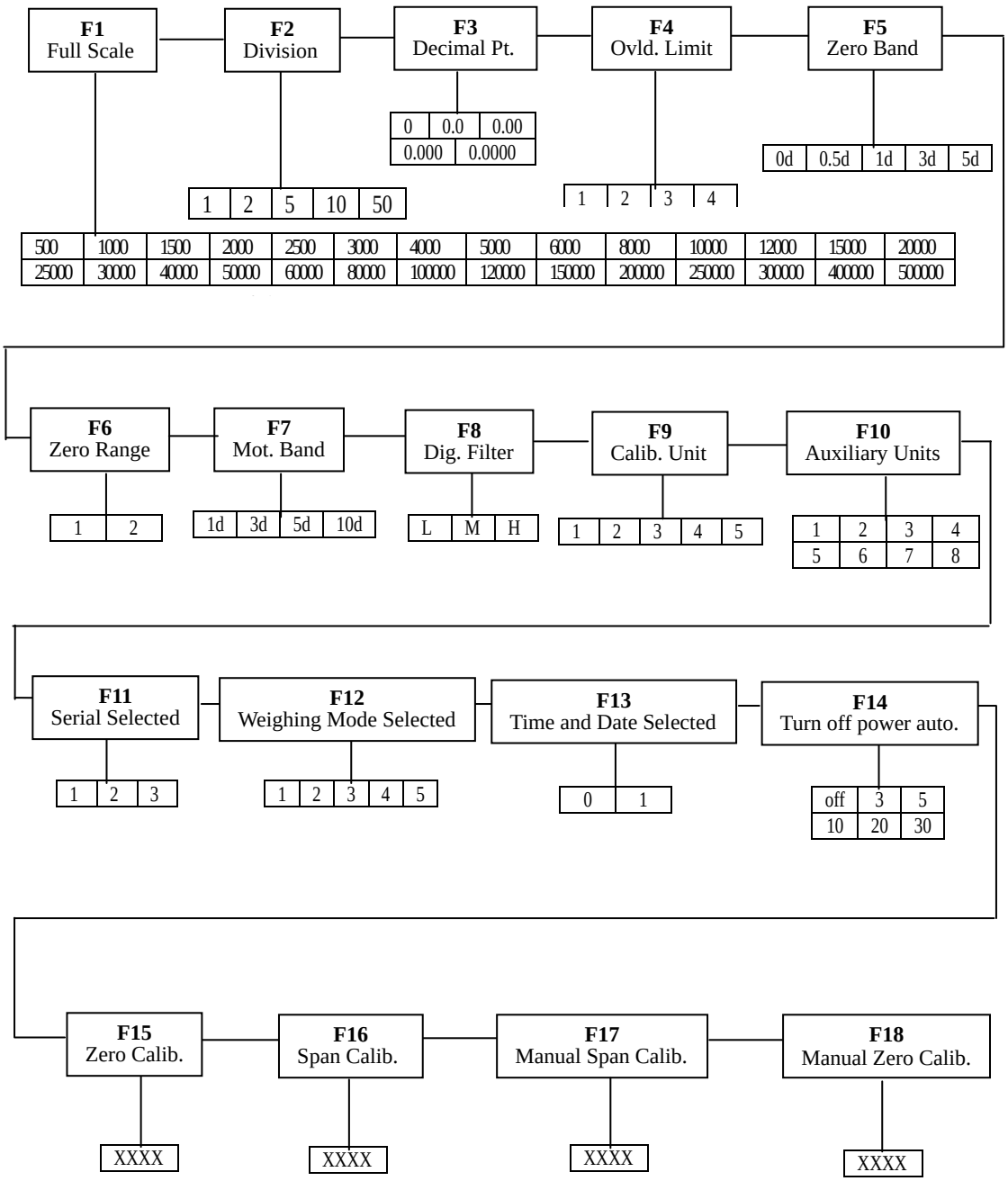


Fig. 6

5. 2 Setup Menu Description

NAME/CODE	DESCRIPTION	CODE/VALUE
F1 Full Scale	Full Scale＝Graduation×Division (**See Appendix C**)	500, 1000, 1500, 2000, 2500, 3000, 4000, 5000, 6000, 8000, **10000** √ , 12000, 15000, 20000, 25000, 30000, 40000, 50000, 60000, 80000, 100000, 120000, 150000, 200000, 250000, 300000, 400000, 500000
F2 Division	Minimum difference between two weighing readings	**1** √ **,** 2, 5, 10, 50
F3 Decimal Pt.	Determines location of the decimal point.	**0** √ **,** 0.0, 0.00, 0.000, 0.0000
F4 Overload Limit	Selects the desired formula which determines the point at which the indicator shows overload. All selections are based on the primary unit.	FS+0d FS+2% FS+1d FS+**9d** √
F5 Zero Track Band	Selects the range within the scale will automatically zero. Note that the scale must be in standstill to automatically zero. Selections are in Display Divisions.	0d **0.5d** √ 1d 3d 5d
F6 Zero Range	Selects the range within the scale may be zeroed. Note that the indicator must be in standstill to zero the scale	1.9-1.9%FS **100-100%FS** √
F7 Motion Band	Sets the level at which motion is detected by comparing the present display update with the previous one. If motion is not detected for 0.5 seconds of more, scale is in standstill and can process a Print or Zero command. Maximum value varies depending on local regulations	**1d** √ 3d 5d 10d
F8 Digital Filter	The higher the filter number, the greater the stability but the slower the response time.	L **M** √ H
F9 Calib. Unit	Selects the primary base unit to be used in the calibration process. Also the default unit for normal operation. "1"= t "2"= kg "3"= g "4"= lb "5"=oz	1 **2** √ 3 4 5
F10 Auxiliary Units	Press the [UNITS] key to toggle the unit between calibration units and auxiliary units in weighing mode. "1"= off "2"= t "3"= kg "4"= g "5"= lb "6"= oz "7"= KN "8"= lb:oz	**1** √ 2 3 4 5 6 7 8
F11 Serial Connectors	"1"= RS－232C or RS－485serial connector or 4~20mA current loop output for remote display. "2"= Serial connector for printing "3"= Serial connector for printing automatically	**1** √ 2 3
F12 Weighing Mode	"1" = Normal weighing mode "2" = Piece Counting "3" = Peak Hold "4" = Percent mode "5" = Weight testing (overload or too light) "6" = Animal weight mode	**1** √ 2 3 4 5 6
F13 Time and Date Selected	"0" = Print with time and date "1" = Print without time and date	**0** √ 1

NAME/CODE	DESCRIPTION	CODE/VALUE
F15 Turn off the power auto.	The unit is second, the indicator will turn off automatically after six times beeper even if no keys pressed at selected time.	Off 3 5 **10** √ 20 30
F15 Zero Calib.	See in **Form 5.3**	
F16 Span Calib.	See in **Form 5.3**	
F17 Manual Zero Calib	See in **Form 5.3**	
F18 Manual Span Calib.	See in **Form 5.3**	

Remark: Factory-set defaults are shown in bold with a " √ ".

5. 3 Calibration for the scale

STEP	NAME	DISPLAY	OPERATION
1	Zero Calibration (**F15**)	XXXXX	Display internal codes at zero, press the **[SET]** key to memory the zero calibration value after the scale is stable and empty. Then return to F16 waiting for Span Calibration.
2	Span Calibration (**F16**)	XXXXX	Display original weight value, you can enter new value using **[←]** and **[→]** keys, return to F16 after pressing the [SET] key when the weight is equal with the displaying value and the scale is stable. The indicator will display the correct value by pressing the **[↓]** key, please re-calibrate if it is not correct, it will return to F16 automatically after calibrating successfully, it will also display the error code if not success and return to F16 after 3 seconds, please re-calibrate after checking.
3	Manual Zero Calib. (**F17**)	XXXXX	Display zero calibration value. You can also enter the value using **[←]** and **[→]** keys to check and amend the zero calibration value.
4	Manual Span Calib. (**F18**)	XXXXX	Display span calibration value. You can also enter the value using **[←]** and **[→]** keys to check and amend the span calibration value.

Note: The weight value of span calibration is 20%F.S. at least. Zero calibration value and span calibration value can be checked in F17 and F18 after being calibrated successfully. Please fill the calibration data in the following form to prevent data missing in an accident. You can key-in the data without re-calibration.

ID NO.	Zero Calib. Value (F17)	Span Calib. Value (F18)

Chapter 6: User “A” Menu

6.1 USER MENU CHART

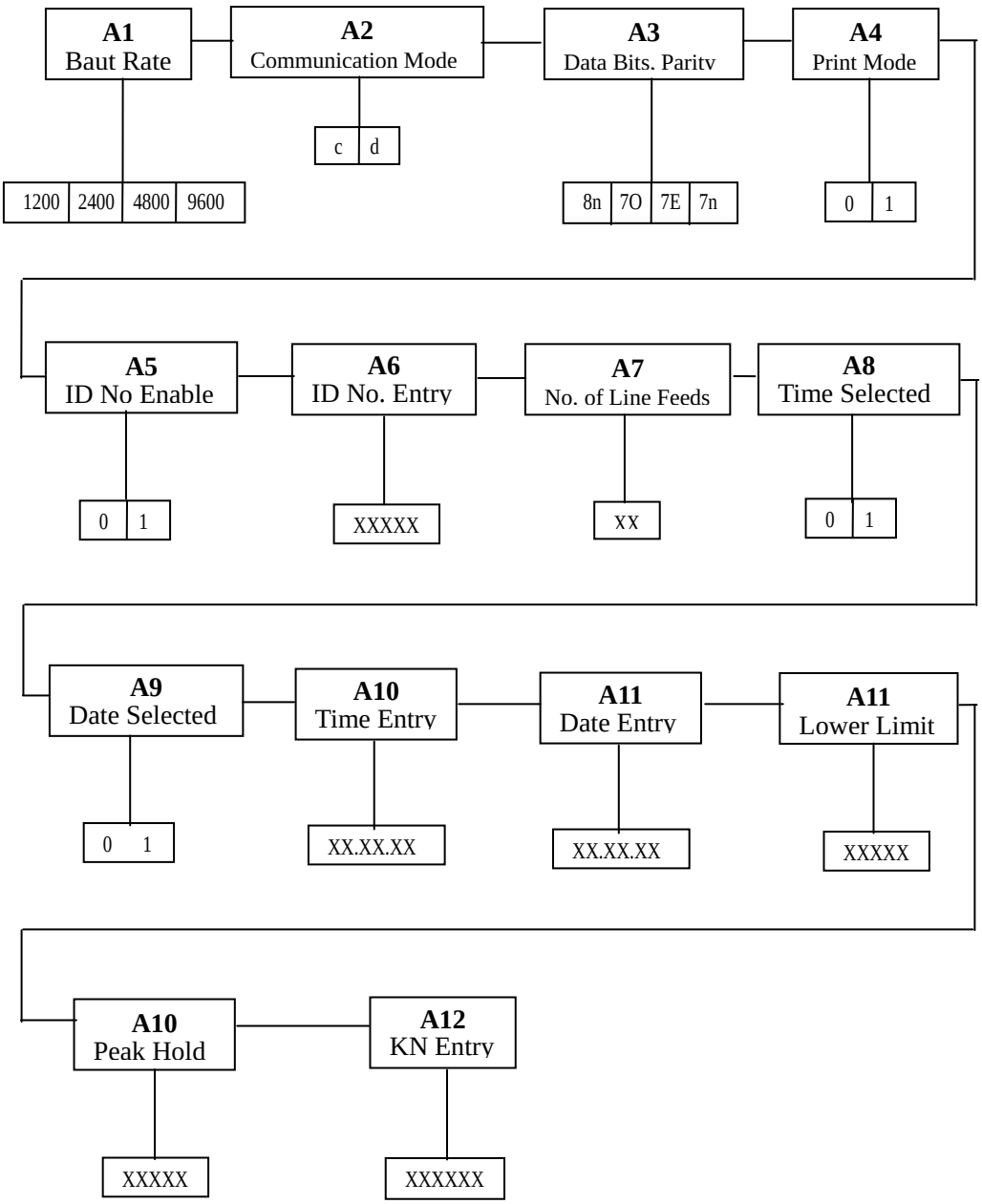


Fig. 7

6.2 User Menu Description

NAME/CODE	DESCRIPTION	CODE/VALUE
A1 Baud Rate	Selects the baud rate for data transmission through both serial ports	1200 2400 **4800 √** 9600
A2 Communication Mode	"C" = Continuous mode "D" = Command mode	**C √** D
A3 Data Bits and Parity	Selects the number of data bits and parity of serial tansmission. 8n＝8 data bits with no parity bits and one stop bit 7O＝7 data bits with odd parity bit and one stop bit 7E＝7 data bits with even parity bit and one stop bit 7n＝7 data bits with no parity bit and two stop bit	**8n √** 7O 7E 7n
A4 Print Mode	"0" = Print "GROSS NET TARE" "1" = Print "Displayed weight"	**0 √** 1
A5 ID No. Enable	"0" = Disable the ID No. "1" = Enable the ID No.	**0 √** 1
A6 ID No. Entry	Allow the ID number to be disabled in the Print Ticket mode. Valid only when A4 is set to "1".	0~999999 **123456 √**
A7 No. of Line Feeds	Actuates the function that allows entry of the desired number of line feeds to be printed in Print Ticket Mode.	0~99 **3 √**
A8 Time Format	"0" = 12 Hr (Please add "80" if you enter the time in the afternoon. For example, if the time is 2:00 PM, your entering the time is 82) "1" = 24 Hr	**0 √** 1
A9 Date Format	"0" = mm/dd/yy "1" = dd/mm/yy	**0 √** 1
A10 Time Entry	Display original time, you can enter new time using the [←] and [→] keys and press [SET] key to confirm.	
A11 Date Entry	Display original date, you can enter new date using the **[←]** and **[→]** keys and press **[SET]** key to confirm.	
A12 Lower Limit	This is to can test the lower limit of weight, you can enter the lower limit value using the **[←]** and **[→]** keys and press **[SET]** key to confirm.	
A13 Peak Hold Entry (Upper Limit)	Peak hold appears when F12＝2, and the peak hold value should less or equal to 100%F.S., you can enter the peak hold value using the **[←]** and **[→]** keys, then press the **[SET]** key to confirm. The indicator can test the upper limit of weight when F12＝5, and upper limit also need less or equal to 100%F.S., also you can enter the upper limit value using the **[←]** and **[→]** keys and press the **[SET]** key to confirm.	
A12 KN Unit Entry	Units can be changed between KN and kg, you can enter a 6-digit number using the **[←]** and **[→]** keys and press the **[SET]** key to confirm.	

Remark: Factory-set defaults are shown in bold with a " √ ".

Chapter 7: Operation

7. 1 Weight operation

1. Select weighing mode (F12＝1)
2. Pressing **[UNITS]** key until it appears the unit you want.
3. If you need, press the **[ZERO]** key to zero out the displayed value.
4. Press the **[NET/GROSS]** key, and the display value will be changed between gross and net
5. The indicator will display "－OL－” when the scale is overload.

7. 2 Taring

7. 2. 1 Taring an item of unknown weight

To weigh an item in a container, the weight of that container must first be subtracted from the overall weight to obtain an accurate weight reading. This is known as taring.

1.Select the desired weighing unit by pressing the **[UNITS]** key until that unit is indicated on the display.
2. If necessary, press the **[ZERO]** key to obtain a weight reading of zero.
3. Place the empty container on the scale’s platter and allow the weight indication to stabilize. Then press the **[TARE]** key to make the NET annunciator on, the display shows zero weight.
4. Place the material to be weighted in the container and allow the weight indication to stabilize. Read the weight shown on the display.
5. You may toggle between the gross weight and the net weight by pressing the **[NET/GROSS]** key.

7. 2. 3 CLEARING THE TARE WEIGH VALUE

Zero the gross weight and press [TARE] key to zero the tare value.

7. 3 PIECE COUNTING

This mode is used to indicate the number of pieces of an item you have placed on the scale’s platform and is accessed by pressing the [UNITS] key. To ensure accuracy, the parts you are counting must be consistent in weight.

The indicator used the sampling method to determine the average piece weight (APW) of the items you wish to count. If the APW of the items is too light or the total weight of the sample is too light, accuracy cannot be guaranteed. You will get an error message, buy piece counting will still be allowed.

NOTE: Piece counting must be enabled in the Setup Menu (F12＝2) in order to use this feature.

7. 3. 1 PIECE COUNTING – UNKNOWN AVERAGE PIECE WEIGHT

1. If the items you will be counting require a container, you should first tare off the weight of that container by following the appropriate procedure in either Section 7.2.1 or Section 7.2.2.
2. Select F12 = 2 in Menu F.
3. Place the sample items on the platform all at once and allow the weight indication to stabilize. Press the **[SET]** key, the APW of the items will be displayed if the total weight of the sample is sufficient. Otherwise, the indicator will display Error Code "EE61", repeats Step 2 to increment the sample size.
4. Press the **[UNITS]** key until the units annunciator off, and press the **[TARE]** key to displays "XX 0" and enter piece counting mode.
5. Press the **[NET/GROSS]** key to change the number of the sample "XX" (can be select from 10/20/50/100/200) until displaying the number you want.
6. Put XX pieces samples in the plate to display "XX -".
7. Press the **[NET/GROSS]** key to display "SET" sign, and enter number displaying mode after 1 second, display "YY".
8. Press the **[TARE]** key to exit number displaying mode, display "XX -", you can take away the samples and enter step 6.

7. 4 PEAK HOLD

Set F12 to 3 so as that the indicator have the peak hold feature, and set the value of peak hold "A13".

1. Press the **[NET/GROSS]** key to make the "GROSS" annunciator on.
2. Press the **[UNITS]** key to make the "PCS" annunciator on. If the display weight is greater than A13, then the display goes up with the weight goes up at this situation. When the weight goes down but still greater than A13 and equal with A13, the display keeps on the maximum. When the weight is less than A8, the display goes down with the weight goes down. There is a "≡" in the display when the weight is greater than A13 or equal with A13.

For example, if you select A13=100kg, when the weight goes up to 300kg, the peak hold is 300kg, when the weight goes down to 200kg, display is still 300kg, at this time, if you press **[lb/kg]** button, the peak hold will be 200kg.

3. The indicator will display the actually weight if pressing the **[UNITS]** key during peak hold, and set the actually weight as the peak hold.

7.5 OPERATION OF PERCENT MODE

You should set F12=4 to enter percent mode.

The percent weight＝ Displayed weight × 100%, the indicator displays percent.

1. Press the **[NET/GROSS]** key to make the "gross" annunciator on.
2. Press the **[UNITS]** key by lighting the "PCS" annunciator, the indicator now displays the percent.
3. Press the **[UNITS]** key to make the "PCS" annunciator off, the indicator will display the actually weight

7. 6 OPERATING OF THE WEIGHT TESTING

You should set F12=5 to enter weight testing mode, and set upper limit and lower limit. The display shows "L" when the weight is less than "Testing lower limit", also shows "H" when the weight is more than "Testing upper limit".

7. 7 OPERATING OF THE PRINTING AUTOMATICALLY

You should set F11=3 and F12=5 to start operating the printing automatically, when the weight is added from the weight lower limit to weight upper limit, the indicator will print automatically when the scale is stable.

7. 8 ENTERING AN ID NUMBER

Set "A5 = 0" so that you can enter an ID number

1. Enter A6 in the menu A, and use the **[←]** and **[→]** keys to enter the ID number you want, press the **[SET]** key and the current ID number now reverts back to the value saved in the User Menu.
2. Press the **[PRINT]** key, the ID number can be printed.

7. 9 ANIMAL WEIGHING MODE

Set "F12 = 6" so that you can enter animal weighing mode.

1. Press the **[UNITS]** key at formal weighing mode, then appear "=" on the left means that you are entering animal weighing mode.
2. The weight does not increase after the animal step up to the scale and the scale is stable (stable annunciator is on), besides, the weight must be more than 10%F.S., the indicator will lock the weight, when the animal step down the scale and the weight is less or equal to 50%, the indicator will release the weight and the display will vary along with the weight.
3. Please select motion range (F5) according to actual situation when you use animal weighing mode.
4. Press the **[UNITS]** key to exit and return to formal weighing mode and display actual weight value.

8 RS－232 Communication

Wiring please sees in **Fig 4**.

8.1 Consolidated Controls Demand Mode

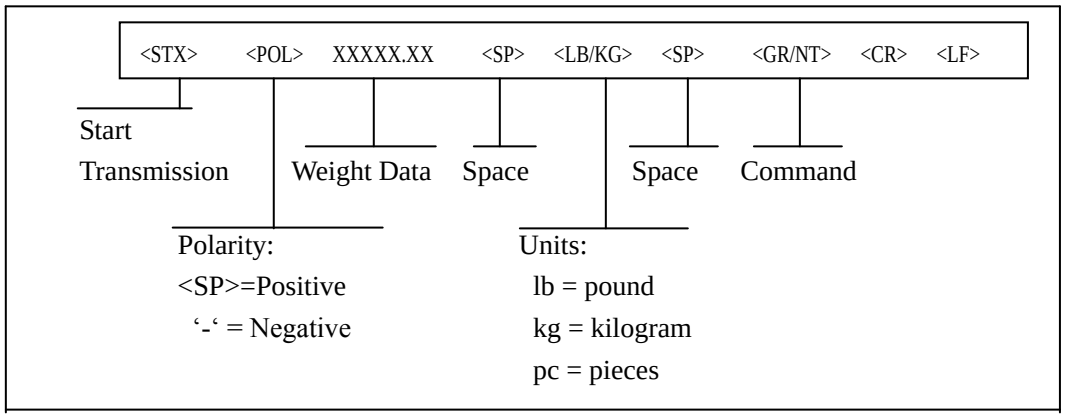


Fig. 8

8.2 Recognized Host Commands

"P"— This command is sent to the indicator to print the indicated display. The indicator will not respond if the scale is in motion, positive overload or negative overload.

"Z"— This command is sent to the indicator to zero the scale. The indicator will not respond if the scale is in motion, positive overload or negative overload.

"T"— This command is sent to the indicator to tare the scale. The indicator will not respond if the scale is in motion, positive overload or negative overload.

"G"— This command is sent to the indicator to revert to gross mode. The indicator will not respond if the scale is in motion, positive overload or negative overload.

"N"— This command is sent to the indicator to revert to net mode. The indicator will not respond if the scale is in motion, positive overload or negative overload.

"C"— This command is sent to the indicator to toggle among the configure units.

9. SPECIFICATIONS

- No-linearity 0.01％FS
- Input Signal 15mV
- Input Sensitivity 0.4uV/d
- A/D Conversion Rate 50 times per second
- Internal Resolution 500,000 Counts
- External Resolution 50,000 Counts
- Setup parameter via menu mode, calibrate numerically.

- Extra Units
- Counting Mode
- Peak Hold
- Percent Style
- Weight Testing Feature
- Time and Date Print
- RS－232C and RS-485 Serial Communications
- Serial Print Output
- 4~20mA current loop for remote display output
- Excitation Voltage　　5±0.3V, 4×350Ω load cells
- Environmental
  Operating Temperature　　-10℃ ~ 40℃
  Humidity　　40℃ (20~90)%RH
  No corrosive gas and no strong EMI in use field.
- Mechanical　　305mm×203mm×102mm(12”×8” ×4”)

APPENDIX A: PRINT TICKET MODE

DATE	06/02/2000
TIME	12:36
ID.NO	12345
GROSS	1000 kg
NET	800 kg
TARE	200 kg

Select A4=0 in menu “A”

DATE	06/02/2000
TIME	12:36
ID.NO	12345
	1000 kg

Select A4=1 in menu “A”

APPENDIX B:

	off	t	kg	g	lb	oz	Kn	lb:oz
t			1t=1000kg		1t= 2204.58838lb			
kg		1kg= 0.0001t		1kg= 1000g	1kg= 2.20458838lb		1kg=xxx kn	1kg= 1(lb)3.27341408(oz)
g			1g=0.001kg		1g= 0.00220458838lb	1g= 0.035273368oz	1g= 0.001×x.xxxxkn*	
lb			1lb= 0.4536kg			1lb=16oz	1lb=＊ 0.4536×x.xxxxkn	1lb=3(lb)2(oz)
oz			1oz= 0.02835kg	1oz = 28.35g	1oz = 0.0625 lb		1oz= 0.02835×x.xxxxkn *	

Note: The conversion rate between kg and Kn is different in different place because of the different gravity,

it can be entered in A12.

APPENDIX C: DISPLAYED ERROR CODES

CODE	MODE	MEANING / POSIBLE SOLUTION
－OL－	Normal Operating Mode	Gross Overload. A weight greater than the rated capacity has been applied to the scale. Remove the weight from the platter of try re-calibrating the scale. Otherwise, check for a bad load cell connection or possible load cell damage due to overloading.
EE0	Normal Operating Mode	The code of the "F" menu or the "A" menu varies, re-set the code, the EEPROM may be damage if still appearing EE0.
EE01	All Modes	EEPROM error, change "X25045"
EE02	All Modes	RAM error, change "DS12C887"
EE2	Normal Operating Mode after turning on the indicator	Accumulative zero value ＞20％FS, indicating that the shift of the scale is much large.
EE20	Normal Operating Mode	Press the [ZERO] key since the zero is ＞20％FS
EE21	Normal Operating Mode	Press the [Zero] key since the scale is in motion or overload.
EE22	Normal Operating Mode	Press the [ZERO] key since the displayed value is out of zero range
EE3	In menu "F" mode	The divisions are not correct, see Appendix C.
EE30	Span Calibration Mode (F20)	No weights on the platform, put the weights on the platform.
EE31	Span Calibration Mode (F20)	Use small weight to calibrate the large weight.
EE32	All Modes	A/D works normally, check the wirings, if so, change the PCB.
EE4	Time and Date Entry	Time entry or date entry is wrong, re-entry.
EE5	Units Select	Unit selection is wrong, change F9 or F10.
EE50	Units Select	Decimal position selected is wrong
EE60	Counting Mode	APW is less than "2", add the sample weight.
EE61	Counting Mode	The sample number are too many, and the weight of the samples are too less.
EE7	Set Taring	Tare Weight Value > 80％F.S., re-adjust tare weight value.
	Set "A10"	A10 > 80％F.S., re-adjust A10.
EE70	Set Taring	The scale is in motion, positive overload or negative.
EE8	Kn Entry	Kn < 9.70000, re-entry.

APPENDIX D: Minimum Recommended Span Gain Table

F1 \ F2	1	2	5	10	20	50
500	500	250	100	50	25	10
1,000	1,000	500	200	100	50	20
1,500	1,500	750	300	150	75	30
2,000	2,000	1,000	400	200	100	40
2,500	2,500	1,250	500	250	125	50
3,000	3,000	1,500	600	300	150	60
4,000	4,000	2,000	800	400	200	80
5,000	5,000	2,500	1,000	500	250	100
6,000	6,000	3,000	1,200	600	300	120
8,000	8,000	4,000	1,600	800	400	160
10,000	10,000	5,000	2,000	1,000	500	200
12,000	/	6,000	2,400	1,200	600	240
15,000	/	7,500	3,000	1,500	750	300
20,000	/	10,000	4,000	2,000	1,000	400
25,000	/	/	5,000	2,500	1,250	500
30,000	/	/	6,000	3,000	1,500	600
40,000	/	/	8,000	4,000	2,000	800
50,000	/	/	10,000	5,000	2,500	1,000
60,000	/	/	/	6,000	3,000	1,200
80,000	/	/	/	8,000	4,000	1,600
100,000	/	/	/	10,000	5,000	2,000
120,000	/	/	/	/	6,000	2,400
150,000	/	/	/	/	7,500	3,000
200,000	/	/	/	/	10,000	4,000
250,000	/	/	/	/	/	5,000
300,000	/	/	/	/	/	6,000
400,000	/	/	/	/	/	8,000
500,000	/	/	/	/	/	10,000