

You are welcome to use I-1650™ indicator. Please read this manual carefully before you use it. Pay special attention to the following points. If the manual contradicts the below explanation, please follow the below explanation.

Chapter 1: Technical Parameter

1. Preface

One of the most attractive character of this indicator depend that it fleshes people's eyes, it has beautiful and uncommon appearance , and it is full of activity . However, the same as it's inner quality. It is designed as reliable and mature hardware and scientific fashionable software ,adopting the AD technique of high speed and precise. It reflects the ENTEC ideal of doing anything from the point of people whatever in it's appearance and it's operational function. If you are patient to read the following parts, you will understand that I-1650 indicator is a worthwhile product and it can bring measurement for you.

2. Main characters:

- 2.1 High speed and precise, low temperature floating and long-time stability
- 2.2 High reliability and strong power of defending interruption .
- 2.3 Easy to operate and master.
- 2.4 Multiple-functions and strong power acclimation

3. Main function

- 3.1 The extremely wide signal input range of 0.1mv-30mv.1000,000A/D internal division number 50T/S A/D transmitting speed.
- 3.2 Full panel calibration of zero and weighing range
- 3.3 Non-linearity amendment.
- 3.4 Load cell long-linearity compensation
- 3.5 Automatic alarm when load cell are misconnected .
- 3.6 Can be matched with Panasonic KX-P1121, TM-800 printers, etc., which are compatible with EPSON command.
- 3.7 Many kinds of printing formats and can print daily report format and classified statistical forms.
- 3.8 Storing 500 printing records or so, protecting data when power-off.
- 3.9 Digital filtering wave data optional
- 3.10 Set zero tracking range
- 3.11 Set zero range
- 3.12 Deducting tare weight, pre-setting gross weight and use gross weight as truck number.
- 3.13 Owning total self-checking function and many kinds of information cue.
- 3.14 Parallel interface can be matched with many external equipments.

4. Parameter index:

4.1 Simulation parts:

- Inputting signal range: 0.1mV-30mV
- The Max. net input signal : 25mV
- Transmitting speed: 50T/S
- A/D transmitting: 1 million
- Non-linearity : <0.01%F.S
- Increasing drift : 6 PPM/□(TYP)
- Zero drift :10PPM/□(TYP)
- Excitation power supply: DC.12V
- Loading capacity : Can be connected with 6pcs 350Ω or 12pcs 700Ωload cells.
- Load cell connecting method : six-linearity, Automatic compensation by long line.

4.2 Display

- 6 digits VPD display : 1" high and 6 weighting state indicating.
- Division value: 1/2/5/10/20/50/100 option.

4.3 Keyboard:

- Digit key :0-9
- Functional key : 14
- Key material :Soft membrane
- 4.4 It can display Year/month/date/hour/minute/second.
 - a. Clock: Automatic leap year and leap month
 - b. The discrepancy of a year is below 2 minutes(at normal temperature)
 - c. On power-off condition, it can work more than 3 years.

4.5 Printing interface: Parallel output interface.

Can be matched with micro-printer of 6 or 24 pins.

4.6 Serial communication interface

- Signal: (1).RS-232
(2).RS-422(option)
(3).20mA electric current annulus (need external electric supply)
- Baud rate : 600/900/1200/1800/2400/3600/4800/9600 optional
- Transmitting data format : 11 bits (1 starting bit ,8 binary systematic data bit ,1 programmable bit ,1 stopping bit)
- Transmitting distance: (1) RS-232<15m
(2) RS-422≤1000m
(3) 20MA current annulus ≤2000m

4.7 Data storage: Can store about 500 printing records, protect when power is off.

4.8 Working environment

- Power Supply : 220VAC (-15%~+10%) 50HZ±2%
- Temperature: 0~40°
- Storage and transportation Temperature: -15~+55°
- Relative humidity: <90%RH (no cold condensation)
- Warm-up time: 15 minutes
- Fuse storing capacity: 500MA

4.9 Appearance: 320×200×160

4.10 Weight : 3kg or so (in plastic enclosure)

Chapter 2: Function introduction

1. Terms

In order to help users read and understand the manual, please find the following brief introduction to the terms and habitual appointments.

- Net: The weight of the goods itself.
- Tare: The weight of the container for product.
- Gross: The weight of the goods plus the weight of it's container .That is to say the total weight of net weight and tare weight.
- Full span: max capacity of the scale or max rating measurement.
- Division Number(n): Dividing the full span into many equal parts and each part is the same weight. The divided equal parts art called the division number of the scale, and the precise grade depends on the division span.
- Division value(d): Dividing the full span into many equal parts and each part is the same weight. This weight is called division value.
- The relation among division number, division value and full span:
Division number × Division value=Full span
- Dynamic state : A state in which the scale can't get the real weight of the goods. This state often happens at the beginning of putting goods on the scale. (or taking goods off).
- Zero return: A state that force the scale to return to the blank scale and the indicator display "zero", if there is some sundry on it, the sundry should be considered as a part of it. The scale can't return to "zero" when the sundry is over a certain weight value.
- Zero tracking (AZM) : When the indicator display "zero" and if the goods on the scale have slight and slow change, the indicator will track these changes and keep the state of zero position so that the next measure can't be influenced. It is used to get rid of the influence of and sundry and zero drift of load cell.
- Zero hunting (AZC) :after the goods are unloaded ,if the scale has a nearby zero display(not display "zero") it will automatically return to zero. Mainly to clear the influence of bits and pieces and the sluggish zero position of the load cell.
- Cargo number: the code name given to the cargo by the user.
- Truck number: The truck number of the goods. Or endowed by the user .
- Efficient weighting: In the normal weighing , press <zero>key, the indicator will display "zero", and the light is on (the scale is empty),if it displays zero but the light is off that indicates there is still some slight stuff on .The user seldom come across this circumstance for the indicator boasts the function for auto tracking. It will also be efficient weighing in this circumstance.

2. Some important appointments

2.1 In the weighing process, if a few things decline (such as stone) on the scale, the scale may display little weight when it return to the zero position. At this time ,you can press <zero>key, and make it to return to zero. For convenient use, the indicator also has zero hunting function. When such position happens, the indicator can return to zero automatically, which can avoid the operator's trouble .

The indicator is mounted with auto zero function. When power on, it will neglect the light stuff on the scale .But if the stuff is too heavy (exceed the designed value) it will display the weight of the stuff directly.

2.2 In the zero position, if the sundry things are removed and the changes are slight , the indicator will display a negative value to indicate the changes of the scale body. Under such position , you can press "<zero> key to force the scale to (such changes are admitted),if the changes are too obvious ,the indicator will display "rr-1 " to i return to zero indicate the scale body is too light ,you can't see the detailed amount, but you can force it to return to zero by pressing the <zero >key, in some extreme circumstance the change will be too enormously, it will fail to return to zero by pressing <zero> key, then you have to cut off the power and turn on again to carry through the next weight.

2.3 If you want to weigh something, please put it on the scale body directly(e.g. to drive the truck on).After a few seconds, the display number will turn bigger and bigger, and the "stable" light flashes to indicate the scale is unstable. and the display is not the real weight of the goods. (the scale is a dynamic state),so it can't be considered as the record (in dynamic state ,many functions of the indicator are prohibited automatically). A few seconds later, the gross or net light will be on to indicate the display has given the real weight of the goods and it can be put into records. If the weight of the goods exceed the span of the scale, the indicator will display "....."(overload indicator) to indicate that the goods are too heavy.

2.4 If the goods are cased with container (e.g. weigh the sand in a truck),the weighting process can be divided into three step: first, weigh the container(the weight of the truck), then weight the whole (the truck filled with sand), the last step is to calculate and get the weight of the goods. the weight of the whole minus the weight of the container will get the weight of the goods. (e.g. the weight of the truck with the goods-the weight of the truck-the weight of the sand). Of course, the first and second step can be converted). We can get tare then the gross or firstly get gross then tare). The last step will be finished by the operator of his own or with the help of the indicator. We have three practical operating methods for user to choose under different circumstance.

2.4.1 If the tare weight is known, just weigh the gross weight of the goods and then the operator can get the net weight only by inputting tare weight.

2.4.2 If the operator doesn't know the tare weight, but the indicator has store it before. Just weigh the gross weight of the goods. Then the net weight can be obtained by out putting the stored tare weight.

2.4.3 The operator neither know the tare weight nor the it was stored before. The user has to weigh the goods and remember or store it by indicator, then weigh and get the gross weight, then net weight will be known.

Notes: The above three methods are finished with the help of the indicator , the general procedure is : weight the tare weight firstly then the gross weight. Such similar steps can also be used to weight the gross weight firstly and the net weight later. (the indicator can also distinguish) .

When there are many trucks waiting in a queue, it is impossible for a truck to weigh the gross (or tare), then unload the goods and weigh the tare (or gross) to get the net weight. If so, other trucks have to wait

for a long time and it is slow and unpractical. Generally, weight the gross (or tare) weight of all the trucks in a short time and unload the goods, then weight the tare (or gross) in a short time to get the net weight. On such circumstance, firstly store the gross (or tare) with a symbol (Generally the truck numbers or edited by the users) ,then it can call the tare (or gross) weight after getting the gross (or tare) weight precisely.

2.5 If the user needs to identify and record the trucks of being weighed, he should input the number of the truck. If the user needs to classify and accumulate the weight of the goods or Just want to record what kind of goods it is ,the user should input the number of the goods of being weighed for it is convenient to make statistics later.

2.6 After the weighing, the user can print the results of weighing in the manual way. If it is an efficient weight, the print results will be done automatically. Meanwhile the indicator records the data. The user can print the whole weighing results and preserve it as data after working all day.

2.7 Different users have different request. Even one user has different request in different circumstance, and different operator has different operating habit. So the indicator can be set in different method to meet the user's different need. In order to meet the measure law and secure the weighing data, the settings of the indicator are classified into two levels. (systematic and user's setting). The settings ordered by measure law and some settings originated from the request of measure safety belong to systematic setting, and they must be confined so that they can't be amended by others. The setting directed to the convenience belong to the user's setting and it can be amended at any time.

Please refer to other chapters in the manual to get detailed explanation.

3. Indicator display

The indicator display is a row of green florescent digital tube with six indicating lights. Under normal weighing state, it displays the weight of the goods on the scale directly (gross or net). If the "tare" light is off, which indicates the weight is gross weight. On the opposite condition, it indicates net weight. The first position on the left is "zero" indicating light .It is on when the scale stabilize in zero or the range of $\pm 1/4$. "stable" cursor is on when the scale is stable. "automatic" light is on, which indicates the indicator is on the automatic printing state. When the weighing is "stable" and the cursor is on for a second, the data will be transmitted to the printer. "Kg" or "Ton" indicating light on indicates that the unit of the data is "kg" or "ton" respectively.

After the indicator is connected with power, the display screen will self-check in the sequence of "000000" to "999999" and then return to the normal weighing state. If the indicator is powered off in a short time, or "other equipments in the indicator are not powered off (such as printer), the indicator will not self-check but to be the weighing state directly when connected to power again. This shows that the indicator has not been cut off actually. In order to protect the indicator, please cut off the power completely and then connect the indicator to power again.

4. Keyboard

I-1650 keyboard is sensitive pellicle and contains 24 pressing keys. Most of the keys can be used separately. But some keys need to be used together with other keys.

5. Command input

To input command, sometimes it can be finished by a key but sometimes it needs a few keys. So there is a process of order input, and the second order can't be input before you input, the first key. In the input process, you can press [pause] key to cancel the order that has not been input. It means to let the indicator give up the current order and accept a new one.

Chapter 3 Operation

1. Operation

1.1 Weighing without tare/gross weight

single truck weighing

Tare weighing first and then gross weighing: After empty truck is driven on the scale stably, you press [tare] key, after the goods is loaded, drive the truck on the scale again. The indicator can display net weight directly. Then you can get printing results by pressing [print] key.

For example: A truck with sand need to be weighed. Assuming the weight of the truck is one ton, and the sand is five ton.

| Description | Operation | Display Data | Tare Cursor | Zero Cursor |
|------------------------|-----------|--------------|-------------|-------------|
| | On | 0 | | Light |
| Weigh Empty Truck | | 1000 | | |
| Store Tare | [TARE] | 0 | Light | |
| Drive Away Empty Truck | | -1000 | Light | Light |
| Drive Away Full Truck | | 5000 | Light | |
| Print Record | [PRINT] | 5000 | Light | |
| Drive Away Full Truck | | -1000 | Light | Light |
| Resume Display | [TARE] | 0 | | Light |

Gross weighing first, and then tare.

At this time, the memory function of indicator is used to store gross weight. After a full truck is driven on to the scale, you should press [digit] key to input the number of the truck, then press[Enter]: <digit>+<enter>, now the gross of the full truck will be stored as the sequence of truck number. Unloading goods, driving the truck on the scale body again, and waiting display is stable, you can press [digit] key (truck numbers) to output gross and then press [truck number] key: <Digit>+<Truck number>, the indicator will deduct tare automatically and display net weight. Then you can press [print] to print results. The whole process is as follows:

| Description | Operation | Display Data | Tare Cursor | Zero Cursor |
|------------------------|---------------|--------------|-------------|-------------|
| | On | 0 | | Light |
| Weigh Full Truck | | 6000 | | |
| Store Gross | <1>+<2>+<3> | 123 | | |
| | [STORE] | 6000 | | |
| Drive Away Full Truck | | 0 | | Light |
| Weigh Empty Truck | | 1000 | | |
| Call The Tare | <1>+<2>+<3> | 123 | | |
| Deduct Tare | [VEHICLE NO.] | 5000 | | |
| Print Record | [PRINT] | 5000 | Light | |
| Drive Away Empty Truck | | 0 | Light | Light |

Successive weighing

Whatever the tare weighing is first or the gross weighing is first, the indicator can memorize, distinguish and deal with them.

When there are many trucks in a queue, it is needed to record the tare(or gross) of each truck separately according the truck number. When the first comes, you press [Digit] key to input truck number and then press [Enter] key ,that is: [Digit]+[Enter] .At this time the tare or gross can be recorded as truck number (truck number is made of digits and it can't exceed six numbers). The following second or third truck can be done like this also, and the indicator will record each tare or gross separately as the truck number. After the trucks are loaded (unloaded) goods, you can get net weight by call the tare (or gross) which has been memorized. operation is as follows:

When the trucks are stable on the scale, you can press the [Digit] key to input the truck number and then press [Truck Number] key. That is <Digit>+<Truck Number>. At this time, the indicator will distinguish which is the first between tare and gross automatically. After doing this, the net weight will be displayed.

For example: To weigh two trucks successively , assume the first truck's number is 456 which has a weight of 2 ton itself and the goods is 5 ton. The second is 789 which has 3 ton tare and 9 ton goods, the current indicator don't store the truck number. The process as follows:

| Description | Operation | Display Data | Tare Cursor | Zero Cursor |
|--------------------------------|---------------|--------------|-------------|-------------|
| | On | 0 | | Light |
| Weigh the first empty truck | | 2000 | | |
| Input the truck number | <4>+<5>+<6> | 456 | | |
| Store gross by truck number | [STORE] | 2000 | | |
| Drive away the truck | | 0 | | Light |
| Weight the second full truck | | 12000 | | |
| Input the truck number | <7>+<8>+<9> | 789 | | |
| Store tare by number | [STORE] | 12000 | | |
| Drive away the truck | | 0 | | Light |
| Weigh the first full truck | | 7000 | | |
| Input the truck number | <4>+<5>+<6> | 456 | | |
| Call the tare by truck number | [VEHICLE No.] | 5000 | Light | |
| Print record | [PRINT] | 5000 | Light | |
| Drive the truck away | | 0 | | Light |
| Weigh the second empty truck | | 3000 | | |
| Input the truck number | <7>+<8>+<9> | 789 | | |
| call the gross by truck number | [VEHICLE No.] | 9000 | Light | |
| Print record | [PRINT] | 9000 | Light | |
| Drive away the truck | | 0 | | Light |

1.2 Weighing if tare or gross is known

If the tare of gross is known ,the net weight of the goods can be got by weighing once.

There're 2 methods:

First : only to output the tare (gross),if it has been stored in the indicator.

After the truck is stable on the scale, press the [Digit] key to input truck number, then press [truck number] key, that is :

<Digit>+[Truck Number] .after the indicator display "----"for a second and the tare cursor is on, the display

date is the net weight of the goods.

Second : Having known quantities of the tare (gross) ,at this time ,you need to input that into storing indicator and then you can output the tare (or gross) when you weigh the trucks .

Pressing the corresponding digit keys to input truck number ,then press <Function>+<2> key, that is: <Digit>+<Function>+<2>. The indicator displays "-tA-"and formerly stored tare(gross) convertible ,then you can input digital data of the tare (gross) which has been know and press [enter] key, that is <Digit>+<enter>, so the formerly stored tare (or gross) is finished.

You only need to call the tare (or gross) when you weigh the trucks.

2. Deducting tare operation

2.1 Deducting tare on normal stare

2.1.1 on gross weighing state: press [tare] key to make the current weight as tare weight and the tare cursor is on which indicate the display is on deducting state .(Display net weight).

2.1.2 On deducing state: Press [tare] key and the light is off, which indicate the display is on gross state. And the tare weight is zero.

2.2 Preset tare operation

Press [Digit] key to input tare weight, then Press [TARE] key ,that is :<digit>+< tare> so the digit is the tare weight and tare cursor is on.

2.3 The display of the current tare weight .

Press [function] +[tare] to display the current tare weight for two seconds.

3. The operation of storing, calling, checking and clearing truck number ,tare and gross weight.

3.1 storing struck number ,tare /gross weight have two circumstances <It is efficient that the tare /gross must exceed 200.

3.1.1 The truck has been weighed and needs to store the weight so that you can call it next time .

Operation : After the display is stable ,press the [digit] key to input truck numbers and then press [store] ,that is [digit]+[store].If the indicator displays "----" for a second ,which indicates the truck number and the weight have been stored, if it display "H---2"for 2 seconds which indicates the storages of the truck number and the weighing have exceeded eighty bits and it will remind the user to delete some of the storage but they also can make storages continuously.

3.1.2 The tare (or gross) has been known and needs to be stored in the indicator .

Operation : Press the [Digit] key to input truck number ,then press [Function]+[2] key ,that is,[Digit] +[Function] +[2]. "----TA----"and the former stored tare (gross) can be displayed convertibly. At this time, you can input the tare(gross) that is needed to be stored,(if the amendment is not needed or stopped, just press [enter] or [pause] key directly).Pressing the corresponding <digit> keys to input tare or gross, and then press <ENTER>, that is k <digit>+<enter>.Now the tare(or gross) has been stored as the sequence of truck number and the indicator recovers the former displaying state.

3.2 Call the tare by truck numbers

After the trick is stable on the scale, please press [digit] key to input truck numbers, then press [truck number] key ,that is <digit>+<truck number>,and the indicator will display “---” for a second and the tare gross will be converted automatically . the tare indicating light is on and the indicator displays net weight.

3.3 check the stored tare/gross by truck number.

Press the corresponding digit keys to input truck number , then press [function]+[2] key.

That is: press <Digit>+[function]+[2] and the indicator will display “—ta—” and stored tare or gross convertibly.

3.4 Check the current truck number

Press [function]+[1] key to display the current truck numbers for 2 seconds.

3.5 Preset the current truck number

The truck has six effective digits, that is “000000-999999”. Press [digit] key to input truck numbers then press [enter] key, that is <digit>+<Enter >,then the current truck numbers are turned into preset numbers. If the truck number is not changed, the current printed truck number will be the previous preset number.

3.6 Clear the stored tare/gross behind some truck number.

Press the [digit] key to input truck number, then press [delete] key, and the tare/gross will be cleared out.(the tare/gross is zero)

3.7 Clear all the tares/grosses stored by truck numbers.

Press [Digit] key ,the indicator will display “CLEAR”, then press <10>+<ENTER> key and the all tares/grosses stored by truck numbers will be cleared.(the who data are zeros)

4. Set and clear the cargo numbers

4.1 Set cargo numbers

The cargo number only has two effective digits “00—99”

Operation : Press [digit] key to input the cargo number then press [cargo number] key, that is [Digit]+[cargo number] ,then the current cargo number will be the set value. If the cargo number is not changed and the current cargo numbers are the set numbers. If the cargo numbers are not be change and the current cargo numbers are the previous set number.

4.2 Clear cargo numbers

Press [delete]+[cargo number]+[enter] key and you can clear the current cargo number, if the

Printed cargo numbers are “---”,which indicate there are not cargo numbers.

Notes:(1)Cargo numbers are not stored in EMS memory but can be stored in 500 printed records(power-off save)

(2)The current cargo numbers are not stored after the power is off.

5. Date and time

5.1 Modification for date and time

Press [date/time] key and the indicator will display “-date-” and the original date convertibly ; Press [digit] key (“DY” “MM” “DD”) to input date, then press [D/T] key and date will be amended, at the same time, then press [D/T] key ,then time is amended and indicator recovers normal weighting state.

5.2 check date and time

If you want to view the date and time, press [D/T] key to check date, and press it again to finish it .(date

and time must be examined firstly everyday).

6. Print and clear printed records

Printing mode (manual/auto) is set by systematic parameter p1 and Printing format is set by systematic parameter

6.1 manual printing

The printing order can be used after the truck number, cargo number and tare weight have been set or [tare] key is called.

On manual printing state (auto-cursor is off), press [print] key and the indicator displays “---” for a second, then it returns to normal weighing state and the printed records are transmitted to the printer.

6.2 Auto-printing

On Auto-printing state(auto-cursor is off) ,after the stable cursor is on a second, the data is transferred to printer for printing.

Note : To guarantee the objectivity and reality of the printed data, the printer can go on printing only when the weighing return below 20d no matter manual or auto. You can not print two or more times with one weighing.

6.3 Printing format

6.3.1 Serial tickets format: (Such as serial two tickers and it has one two, three and four serial bills)

| WEIGH BILL(1) | WEIGH BILL (2) |
|----------------|----------------|
| D: 94/12/31 | D: 94/12/31 |
| T: 15-01-49 | T: 15-01-49 |
| NO: 0010 | NO: 0010 |
| T. NO.: 123456 | T.NO.: 123456 |
| G. NO.: 12 | G.NO.: 12 |
| T.W.: 1000kg | T.W.: 1000kg |
| G.W.: 171000kg | G.W.: 171000kg |
| N.W.: 16100kg | N.W.: 16100kg |

6.3.2 Recording format

WEIGHT Record D: 94/12/31

14:55:56 No:0001 #:123456 H:12 T=1000kg G=21900kg N=20900kg A=20900kg
 14:56:32 No:0002 #:123456 H:13 T=1000kg G=30300kg N=29300kg A=50200kg
 14:57:08 No:0003 #:123456 H:14 T=1000kg G=19100kg N=18100kg A=68300kg
 14:57:39 No:0004 #:234567 H:12 T=2000kg G=12600kg N=10600kg A=78900kg
 14:58:00 No:0005 #:234567 H:13 T=2000kg G=25000kg N=23000kg A=101900kg
 14:58:38 No:0006 #:234567 H:14 T=2000kg G=26000kg N=24000kg A=125900kg
 14:58:57 No:0007 #:345678 H:12 T= 0kg G=11400kg N=11400kg A=137300kg
 14:59:12 No:0008 #:345678 H:13 T= 0kg G=11400kg N=11400kg A=148700kg
 14:59:38 No:0009 #:345678 H:14 T= 0kg G=16500kg N=16500kg A=165200kg

In the above format, No: indicates serial number, add one after printing. #: indicates vehicle number H: indicates the cargo number T: indicates tare G: indicates gross N: indicates net

A: indicates accumulated weight

6.4 Operation for printing daily report (When the version number is less than 2.01, there's no daily report printing function)

6.5 Printing systematic parameter and calibrating coefficient

Press [SET] key the indicator will display "SET" and then press [PRINT] key the indicator will display "-----" for two seconds. It will then print the systematic parameter and calibrating coefficient.

Full=30000kg
d=10
n=0
A=0
r=0100
t=5
o=0119
o1=1
o2=0
P1=0
P2=2
b =4
1-0057 2—4196
3-0057 4—4196

6.6 full printing record indicating

The indicator displays "H---3", which indicates the printing records are nearly 500. The indicator displays "H---4", which indicates the printing records are full.

6.7 Clear printing records (to make the printing serial number begin from one)

Press [clear]+[0]+[enter] key ,the indicator will return to normal weighing state. And the whole former printed records will be cleared out and the printing record number begins from one.

7. Zero position operation

Press [zero] key ,the indicator will return to zero after displaying "----" for a second .Displaying " H---s" indicates weighing > 2%(or 20%)F.S the range of set by systematic parameter 02(±2%F.S or ± 20%F.S).

8. Serial output

Serial output frame has ten digits :1 beginning bit (0),8 date bits (minor in the first),and 1 stopping bit (1)

output serial data is :/n=x (point) T=XXXXXX(tare)

G = xxx xxx (Gross) N = xxx xxx (Net)

Chapter 4 Installation and setting for weighing system

1. Installing guide :

Special Note (1) Installation and setting must be finished by technical craftsman..

(2) The indicator must be powered off when you connect or disconnect all kinds of parts , or the indicator may be damaged.

1.1 Elementary check

After opening the package of the indicator , you must check the accessories with the list in the package. If there is a lack of accessories , please contact with the agents or manufacture to check it's appearance to see if there are loose or destroyed parts.

1.2 Calculation

Please make sure of the scale output is matched with indicator firstly before connecting indicator with scale. If it is standard input , please follow the installation narration . If it is a special structure or it is modified, please calculate the net input mv to see whether the load cell is appropriate or not .the following must be known:

The weighing range (Max. capacity)

Quantities of load cell

Capacity of single load cells

Exciting voltage of the indicator(12v)

rating output of load cell(mv/v)

To input the mv with the below calculating formula

weighing capacity X rating output of load cell(mv/v) X exciting voltage(12v)

single load cell capacity X quantities of load cells.(or level rate)

1.3 Estimate Results: Net input mv is not less 3 mv

For example : Estimate if scale is matched with indicator

Use four load cells of 20 ton separately to make a scale of 30 ton. Assume rating output of the load cell is 2 mv/v, then the capacity of weighing is 30 ton.

number of load cell :4.

capacity of single load cell: 20 ton

exciting voltage of the indicator :12v.

Net input mv is $(30 \text{ ton} \times 2 \text{ mv/v} \times 12\text{v}) / (20 \text{ ton} \times 4) = 9 \text{ mv}$

The result is 9 mv , because it is bigger than 3 mv, so the indicator is matched with the scale.

1.4 Installation

Connect the load cell with indicator as the principles in the < input and output interface>. If needed, it can also be linked to scoreboard display and parallel printer . Pay attention to lock up the accessory locking set tightly in order to prevent the plug from loosing to damage or disable the indicator. TO enhance the indicator's capacity of preventing interruption and make it to work stably ,you must be sure that the crust of the indicator is linked with the earth well. You can do this by the earth line in the plug or the shielding of load cell's cable .If you use both of the ways ,it will be better.

1.5 Setup and calibration

Consult the instruction to set the all setting items of the indicator according to the request Otherwise, the indicator will use the select the set value in the factory automatically. Then calibrate the scale

according to the instructions . It can't be used normally before the legal metrology has checked it carefully.

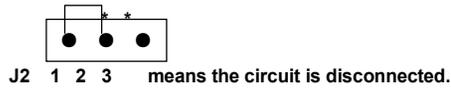
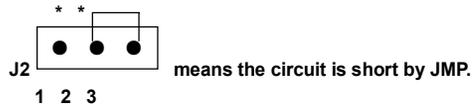
2. Setting Instruction

Instruction : For setting parameter .If you press [enter] key ,the current data will be available and go to the next setup. If you press [pause] key ,the current data is unavailable or back to the previous setup.

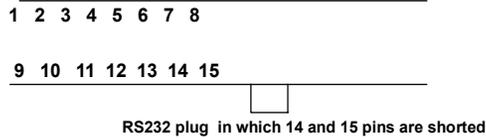
Please firstly plug the load cell, then short the circuit by using the JMP or insert the Calibration plug (15 Core) in the back of the indicator.

Note:

1. When you use JMP to short circuit, you should firstly open the front cover of the indicator, then find the JMP on the PCB. You may refer to the following figure for the circuit state.



2. When you use Calibration plug, you don't need to open the indicator. Please refer to the following figure for details:



After power on, the indicator will do self-check in the sequence of "000000-999999". After the self-check :

1) If it displays : "Err-1". It indicates the analog input or A/D conversion is wrong, at this time, you should check the link between load cell and display.

In the load cell interface:

The voltage between 6-1 is 12v

The voltage between 7-2 is 12v

The voltage between 8-1 is 6v

The voltage between 9-1 is 6v

The voltage between 9-8 is 0.1mv ~ 19mv

By measuring the above voltage, the problem of displaying "Err-1" is easy to be solved to make indicator in normal state.

- 2) If it displays: “H—1” for 2 seconds, it indicates the weighing is too high. If it is the first time that you use it, you can use zero calibrating to make indicator to zero (consult calibrating procedure)

| Steps | Operation | Display | Specification |
|-------|---|--|--|
| 1 | [SET UP] [8715] [INPUT] | “SET” 8715 | |
| 2 | <30000> [INPUT] | “FULL” and “Max. Capacity” alternatively displaying 30000 | For example:30 ton |
| 3 | <0> [INPUT] | D * * 10 | Input division value (d=division value) Can be 1/2/5/10/50/100 For example: 10kg Note:in the normal use you can press [Fun] +<8> to set division value. |
| 4 | <0> [INPUT] | N* 0 | To input the place of the radix point (0-5 optional) For example: decimal point |
| 5 | <0> [INPUT] | A * 0 | Unit setting 0: kg 1: ton For example: kg |
| 6 | <150> [INPUT] | R * 150 | Digit wave-filtering time setting (0—255 optional) For example: 150 |
| 7 | <5> [INPUT] | T * 5 | Digit wave-filtering time setting (0---7 optional) Choice: 5 Note: Generally it is 3 for truck scale |
| 8 | [INPUT] | 0 * * | Indicates 0.4d ISN (This don't need to be set) |
| 9 | <1> [INPUT] | 01 * * 1 | Zero-tracking range (0---7 optional) 0: no zero-tracking function 1:0.4d 2:1d 3:3d 4:5d 5:10d 7:50d For example: Choose 0.4d |
| 10 | <0> [INPUT] | 02 * * 0 | Zero position range setting 0: ≤2%F• S 1:20% F• S For example: choose ≤2%F• S |
| 11 | <0> [INPUT] | P1 * 0 | Printing manner setting 0: manual 1: auto For example: choose manual printing |
| 12 | <3> [INPUT] | P2 * 0 | Printing format selecting (0-4 optional) 0: Record format 1: one serial ticket 2: two serial ticket 3: three serial ticket 4: four serial ticket For example: choose three serial ticket |
| 13 | <4> [INPUT] | b* 4 | Serial baud rate setting (0-7 optional) 0:600 1:900 2:1200 3:1800 4:2400 5:3600 6: 4800 7:9600 For example: choose 2400 |
| 14 | Disconnect the JMP or Calibrating plug | | |

Then you may enter the calibrating process

3. Calibration

In the same way, when calibrating, you also need to use JMP or use the calibration plug to short the circuit. (Please refer to **Item 2. Setting Instruction in Chapter 4 for details**)

3.1 Zero calibration

Make the system in empty scale state and press [set] to display “set”, then press [0]+[zero] key and the indicator will be on zero state.

That is: press [set]+[0]+[zero] , zero calibrating will be ended ,and the indicator displays “zero”, meanwhile, zero cursor is on .

3.2 standard weight calibration

After the indicator displays zero signal , it will enter into standard weighing calibration .

This indicator can calibrate two systematic weighing point to enhance the linearity precision. But the second calibrating weight must be heavier than the first one .

3.2.1 Calibrating for first weighing point

Press [set] to display “set” , Then press<88888>+[enter], that is [set]+<88888>+[enter],to display: “CAL1” ,then put the standard weighing on the scale body. After it is stable, you press [digit] key to input weighing value ,then press [enter] key ,that is [digit]+[enter],the indicator will return to normal weighing state. (If press [pause] ,the current calibrating data is not effective)

3.2.2 Calibrating for second weighing point .

Put another standard weight on the scale on the basis of the first weighing point.(It will be better if it is nearer to full metage). If the weighing value is precise ,then you don't have to calibrate the second weighing point . If there is an error, you can calibrate the second weight point. press [set] to display “SET”, and press <55888>+[enter] key, that is [set]+<55888>+[enter], to display “CAL2”. Then according to the total standard weighing , press [digit] key to input total weighing value, then press [Enter] key .that is <Digit>+[enter], to return to normal weighing state.

3.2.3 Display and amendment for calibrating coefficient

Press [set] to display “SET” .press<33888>+[enter] key ,that is <set>+<33888>+[enter]: if the indicator displays “1—”,it indicates the calibrating coefficient of first point is four bit high.

Press [enter] key ,it displays “2—” to indicate the calibrating coefficient of the first point is 4 bits low. Press [enter] key it displays“3—” to indicate the calibrating coefficient of the second point is 4 bits high. Press [enter] key it displays “4—” to indicate the calibrating coefficient of the second point is 4 bits low. The modification of the calibrating coefficient can be finished by modifying corresponding digits ,but the modification will influence the weight display value of the indicator.

3.2.4 Printing for systematic parameter and calibrating coefficient

Press [set] key to display “set” .then press [print] key to display “—” for two seconds, then it will print and store calibrating parameter and coefficient to avoid inputting again when accidents happen.

3.2.5 Disconnect the circuit by using JMP or Calibration plug (Please refer to **Item 2. Setting Instruction in Chapter 4 for details**).

3.3 Then enter internal code state: press[set]+<92>+[enter] key .the indicator will enter internal display state. Then press [enter] key , it will recover to normal weighing state.

Chapter 5 Input and output Interface

The indicator has load cell interface , parallel printer interface ,serial interface and scoreboard interface and so on . All physical interfaces are set behind the indicator.

1. Load cell interface

Load cell interface adopts 9 core D type plug ,the arrangement is as the following diagram

```

0 0 0 0 0
5 4 3 2 1
9 8 7 6
0 0 0 0
    
```

Figure 5-1 Load cell interface indication

The meaning of the pin signal is shown in the following table:

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|------------------|---------|------------------|
| 1 | -EXEC(-Exciting) | 6 | +EXEC(+Exciting) |
| 2 | -SEN(-Feedback) | 7 | +SEN(+Feedback) |
| 3 | B | 8 | -SIG(-Signal) |
| 4 | D | 9 | +SIG (+Signal) |
| 5 | SHZD(Shield) | | |

It uses 6-line cable of metal shield to connect to load cell. When 6-line load cell is used ,just use cable to connect the corresponding pin.. When it uses the 4-lind load cell ,you should make the +EXEC and +SEN short, so is – EXEC and –SEN. This will make the indicator realize the function of long linearity compensation and to upgrade the precision and stability. See figure 5-2:

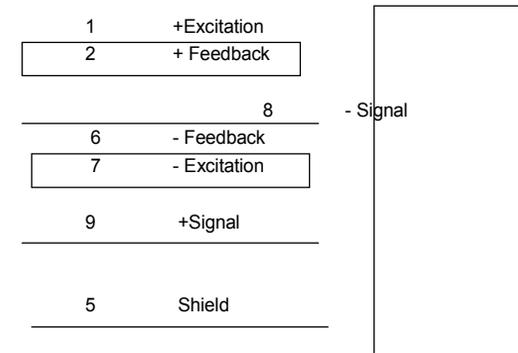


Figure 5-2 Load cell connecting

2 All kinds of output interface

The indicator has 3 kinds interfaces. They are:

1) Parallel printing interface

a. It adopts standard parallel output, and we use a 25-core RS232 socket as its connector. The meaning and arrangement of holes at the indicator side is as Figure 5-3

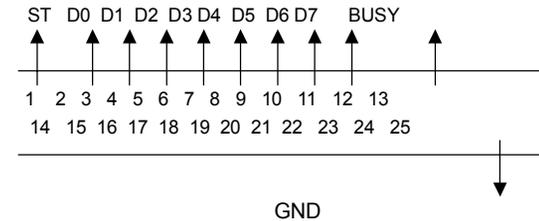


Figure 5-3 Printer interface signal

b. Notice when printing

- . The printer function can only be in normal use after settings.
- . The connection between the indicator printer port and the printer must be correct. You need to use standard printer connecting cable. If the connection is wrong, it will damage the indicator output port or the printer input port, or even damage the indicator and printer.
- . When using the printer, you must firstly connect the cable properly, then connect to the power. Finally, turn on the printer power supply. After your use, you must firstly switch off the power of the printer, then off the indicator power, finally take down the connecting cable. If the sequence is wrong, it may

damage the indicator and printer. Attention please!!

. Because there're many kinds of printers with different performance, the compatibleness with the indicator is different, we kindly request you to use the recommended printers(KX-P1121, TM-800, etc., which are compatible with EPSON command.

. The signal ground of the printer is forbidden to be connected to the power supply ground, otherwise it will damage the indicator and printer.

2) RS-422 output interface

The meaning and of the pin is shown as Figure 5-4

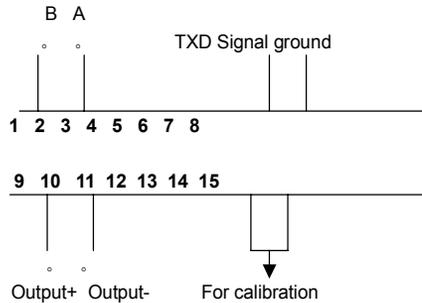
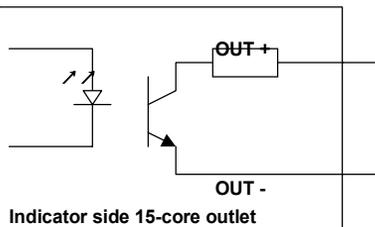


Figure 5-4 Current annulus communication signal

3) Current annulus interface

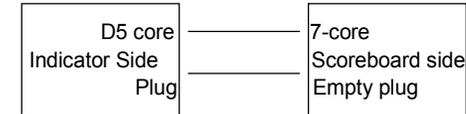
It need to provide 5~12V power supply from the external when using current annulus. The internal connecting is as the follows:



3 Pin Description

3.1 The connection between the indicator and scoreboard

The indicator can be connected to the SC type scoreboard that is produced by our company. The interface of scoreboard is 7-core aviation jack.



The corresponding relationship between the plugs are shown as the following table:

| I-1650 Indicator | Scoreboard indicator |
|------------------|----------------------|
| 7 pins (TXD) | 1 pins (RXD) |
| 8(GND) | 2 pins (GND) |

3.3 Connection between indicator and other external equipments

The interface of the indicator has serial, parallel, scoreboard ones, so can be connected to many external equipment. It can be connected to the computer through both serial and parallel interface and transmit the data to the computer. The indicator can also be connected to common 9-pin printer to print and transmit indicator signal.

You can also use the RS-422 interface and current annulus to transmit the signal in a long cover.

Chapter 6 Maintain and Guarantee

The following rules must be followed in order that the indicators are normally used and the operating life are prolonged.

- 6.1. The indicator can't be used in strong sunlight and it should be flatly placed.
- 6.2. The indicator can't be used in such conditions as powder and high vibration.
- 6.3. Be sure that the ground terminal of the power outlet is properly grounded.
- 6.4. Never use acetone or other volatile solvents such as benzene, nitro-oil etc. to clean it.
- 6.5. Do not pour or spray water on it.
- 6.6. Pull out power supply plug at once if the indicator is out of order in use. Non-specialized manufacturer or non-professional staff can't fix it without authorization. It can be sent to our company for repairs.