METTLER TOLEDO

IND141 Bagfill

Weighing Terminal

Technical Manual

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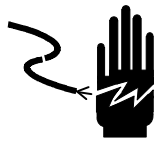
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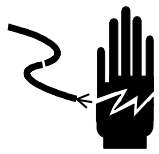
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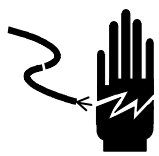
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Please dispose of this product in accordance with local regulations at the c electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

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1. Introduction

This manual is intended to help users to understand the performance characteristics of IND141Bagfill, including the installation, calibration, maintenance and the methods of parameter settings。

1.1. Type

IND141Bagfill including 5 different types for different interfaces.

- IND141Bagfill DIN， Basic
- IND141Bagfill DIN， Dual RS485/ RS232
- IND141Bagfill DIN， PROFINET
- IND141Bagfill DIN， EtherNet/IP
- IND141Bagfill DIN， PROFIBUS DP

The type and serial number can be found in the nameplate of IND141Bagfill. Refer to Figure1-1 to confirm the real configuration.

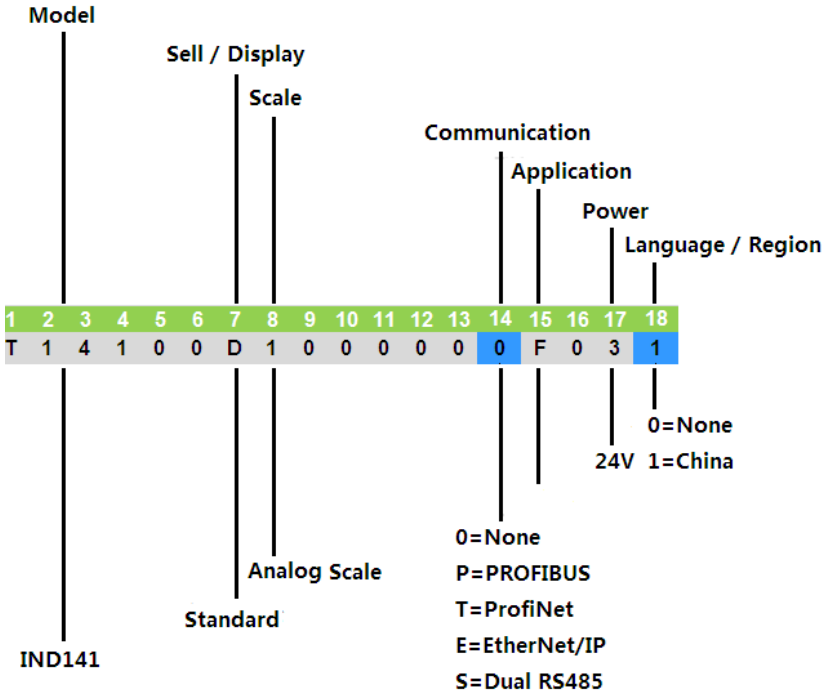


Figure 1-1 IND141Bagfill configuration

1.2 Specifications

IND141Bagfill Specifications	
Enclosure Type	35 mm DIN rail-mount plastic housing with setup interface
Dimensions (l × w × d)	98.5mm x 39mm x 106mm
Shipping Weight	0.5 kg
Environmental Protection	IP20, Type 1
Legal for Trade Environment	The IND141Bagfill will maintain legal for trade approved performance in the range –10° to 40° C (14° to 104° F) at 10% to 90% relative humidity non-condensing,
Hazardous Areas	IND141Bagfill can not be operated in Hazarous areas
DC Input Power	Operates at 24 VDC nominal, -50% - +25%, and 0.5A
Display Type	Green OLED including weight display, weight units, gross/net indication and graphic symbols for motion, center of zero. 4mm Character Height
Status LEDs	4 LEDs(Normal, Power, Runing, Status)
Scale Types	Analog load cells, up to four 350-ohm load cells(2 or 3 mV/V)
Number of Scales	1
Internal and Interface Update Rates (max)	Internal Analog/Digital： 400Hz Internal comparatpor output： 400Hz PLC cyclic and acyclic data： 400Hz
Analog Load Cell Excitation Voltage	5 VDC
Minimum Sensitivity	0.1 microvolts
Keypad	4 keys
Communication	Standard Interfaces Serial Port: RS-232(COM1), 300 to 115,200 baud Optional Serial Port： 1 RS485(COM2) and 1 RS-232/485(COM3)，300~115200 baud PLC Interfaces A single interface supported: EtherNet/IP, PROFIBUS® DP or PROFINET® protocol：Continuous output, the command output，Modbus RTU，Front display(Same size with IND331)
Approvals	Weights and Measures OIML R76 Class III 6,000e approved divisions

1.3 Standard IND141Bagfill Features

- Basic weighing functions including zero, tare, and printing
- DIN type enclosure
- One serial port(RS232) for asynchronous, bidirectional communication and print output
- High-speed AD valid data refresh rate (400 hz), and in view of the new software filtering algorithm was designed for packaging industry.
- Built-in simple comparison model, sequence control model packaging application process (see Charpter4. Process/timing)
- Adaptive parameter setting function, automatically adjust the internal parameters setting, in order to achieve the perfect packaging control.
- Freely configurable function of 3 Inputs and 5 outputs interface.
- Support for the following communication options:
- Dual RS485(Support Modbus-RTU)
- Profibus-DP
- PROFINET
- EtherNet/IP
- New PC configuration tool Setup+ for setting/backup/restore the parameters

2. Installation

This chapter will introduce how to install and debug IND141Bagfill, please read the content before installation.

2.1 Installing DIN Type

IND141Bagfill appearance diagram of DIN as shown in figure 2-1



Figure 2-1 IND141Bagfill diagram

The physical dimension of IND141Bagfill refer to figure 2-2(mm for the unit)

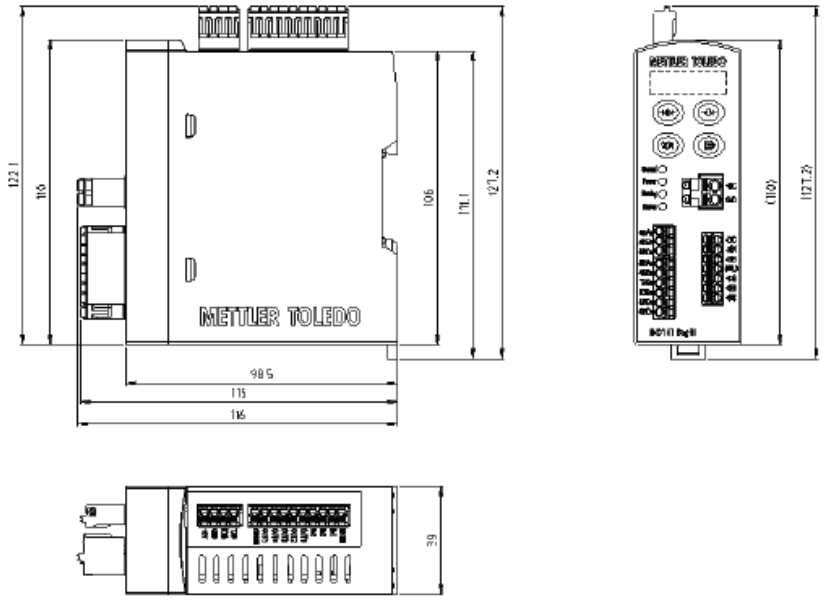


Figure 2-2 IND141Bagfill physical dimension

IND141Bagfill could be installed in stardard guide rail of 35mm wide. The installation steps refer to figures 2-3 to 2-5.

1. Pushed down fixed card lock，as figure 2-3；

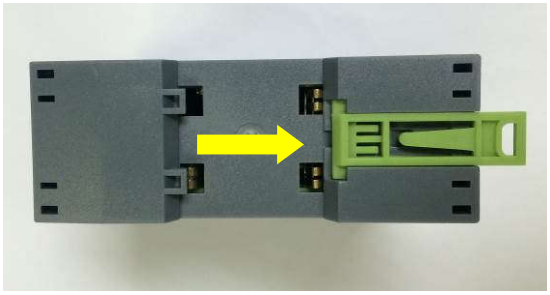


Figure 2-3

2. IND141Bagfill back to the guide rail, to guide groove on the side of the card. Downward pressure, place the IND141Bagfill on the guide rail，as figure 2-4；



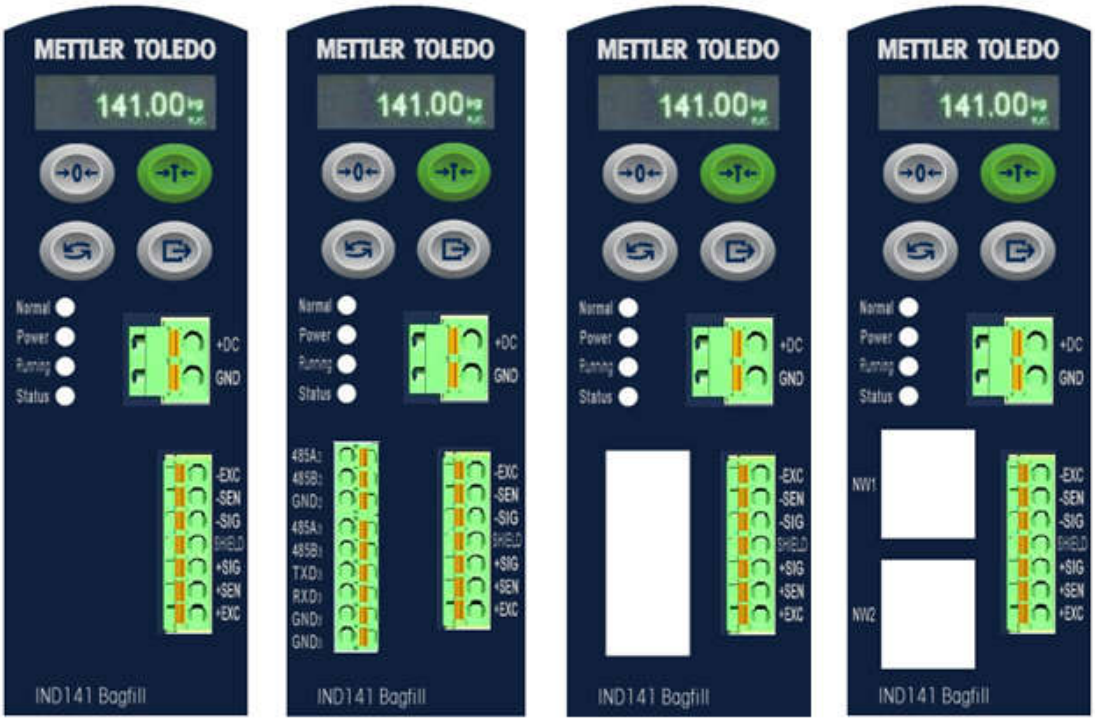
Figure 2-4

3. Into fixed card lock, will completely fixed，as figure 2-5。

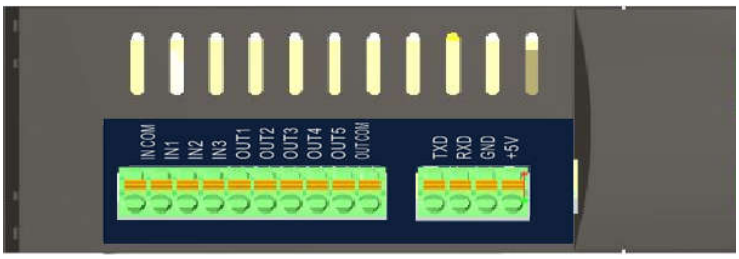


Figure 2-5

2.2 Electric Connection



Basic | Dual RS485 | PROFIBUS DP | EtherNet/IP PROFINET



2.2.1 Power Connection

Only 24 VDC power is available on IND141. The DC power requires 24 VDC, -15%, +20% (at 1.25A maximum).

Table 2-1: Incoming Power Termination

Pin	Description
+DC	12~30VDC，0.5A
GND	GND

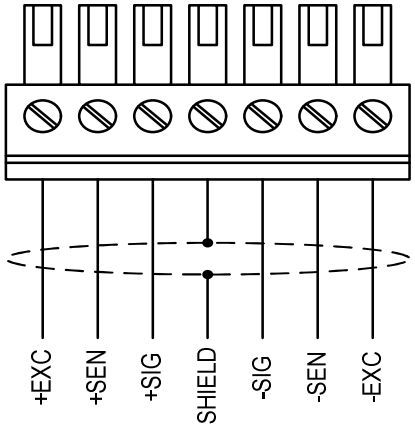
2.2.2 Analog Load Cell Connections

IND141 only can be connected with an analog load cell. Load cell connections are made to the connector located on the front panel.

The maximum cable distance must be reviewed. Table 2- provides recommended maximum cable lengths.

Table 2-2: Recommended Maximum Cable Lengths

TSR (Ohms)	24 Gauge (meters/feet)	20 Gauge (meters/feet)	16 Gauge (meters/feet)
350	243/800	610/2000	1219/4000
87 (4-350 Ω cells)	60/200	182/600	304/1000



NOTES

1. **WIRE SIZE: 18 AWG (0.823 MM2) MAX., 24 AWG (0.205 MM2) MIN**

6 and Figure 2-7 shows the terminal definitions on the analog load cell terminal strip. Note that when using four-wire load cells, jumpers must be placed between the +Excitation and +Sense terminals and between the –Excitation and –Sense terminals.

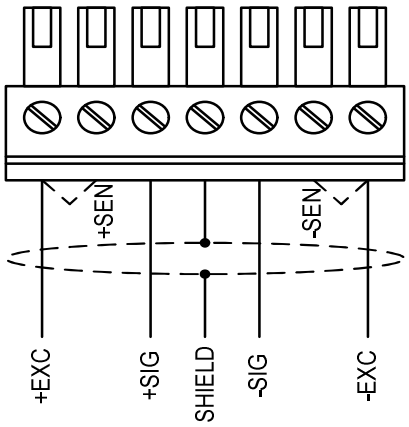
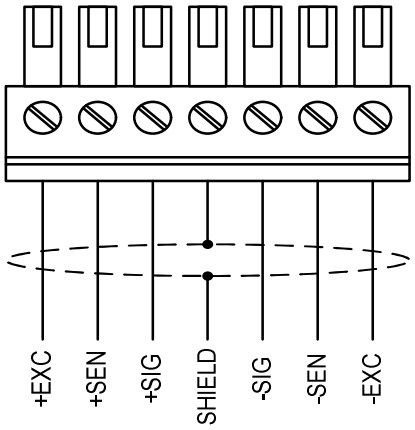


Figure 2-6: 4-Wire Load Cell Termination

NOTES

1. **SINGLE 4-WIRE CELLS: JUMPER +EXC TO +SEN AND JUMPER –EXC TO –SEN AT IND141 TERMINALS**
2. **MULTIPLE 4-WIRE LOAD CELLS: JUMPER +EXC TO +SEN AND JUMPER –EXC TO –SEN AT JUNCTION BOX INPUT TERMINALS**
3. **IF AN INCREASE IN LOAD RESULTS IN A DECREASE IN WEIGHT DISPLAY, REVERSE THE SIGNAL WIRES (+SIG AND -SIG)**
4. **WIRE SIZE: 18 AWG (0.823 MM^2) MAX., 24 AWG (0.205 MM^2) MIN**



NOTES

2. **WIRE SIZE: 18 AWG (0.823 MM^2) MAX., 24 AWG (0.205 MM^2) MIN**

Figure 2-7: 6-Wire Load Cell Termination

2.2.3 Serial Port Connections

A standard RS232 interface, and the other choose double serial version extended two RS485 interface and one of RS485 could be RS232 interface. The serial prot support continuous output, command output, and the MODBUS RTU protocol.

The corresponding pin definition and function of the specific as bellow：

	Terminal Pin	Description	Signal	Application

Standard	RXD	RS232 receive	RS232	Serial port communication with standard configuration
	TXD	RS232 transmit		
	GND	COM GND		
Optional Dual RS485 Version	485A(2)	RS485 receive+	RS485	Multipoint communication connection with upper computer via MODBUS protocol(Extension)
	485B(2)	RS485 receive-		
	GND(2)	COM(2) GND		
	485A(3)	RS485 receive+	RS485	Multipoint communication connection with upper computer via MODBUS protocol(Extension)
	485B(3)	RS485 receive-		
	RXD(3)	RS232 receive	RS232	Point-to-point protocol communication with upper computer(Extension)
	TXD(3)	RS232 transmit		
	GND(3)	COM(3) GND	-	-
	GND(3)	COM(3) GND	-	-

Table 2-3: Front Port Signals

2.2.4 PLC Interfaces

PROFIBUS DP optional version
PROFINET optional version
EtherNet/IP optional version

2.2.5 Input and Output Configuration

IND141 is available with 3 inputs and 5 outputs. Each input and output can be configured freely.

Table 2-4: Input and Output Configuration

Terminal Pin	Default	Description
IN1	Start	0-None; 1-Clear; 2-Clear totalition; 3-Judge; 4-Pause; 5-Start; 6-Start/Stop; 7-Stop; 8-Tare; 9-Zero
IN2	Stop	
IN3	Pause	
OUT1	SP1	0-None;1- Complete; 2-Size up; 3-Lower; 4-Stable; 5-Near Zero; 6-Net; 7- Upper;8-Run;9-Fast Feed (SP1);10- Middle Feed (SP2); 11-Fine Feed(SP3); 12-Tol-; 13-Tol+.
OUT2	SP2	
OUT3	SP3	
OUT4	Complete	
OUT5	Size up	
COM		GND

2.2.6 Circuit Connection Of Discrete I/O

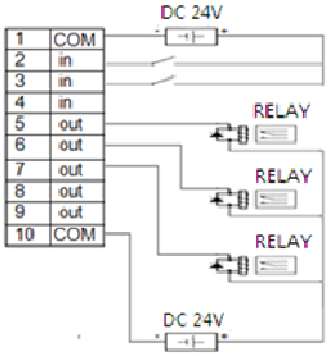


Figure 2-8: Discrete I/O connection

Table 2-5: Output Features

Feature	Output	Status
High Level	~23V	Active
Low Level	0V	Pause
Current	200mA/channel(Max)	

Table 2-6: Input Features

Feature	Input
High Level	10-24V
Low Level	0-5V

2.3 Master Reset and Measure Switch

The master reset and measure switch (SW1) located at the bottom of the IND141Bagfill, as figure 2-9

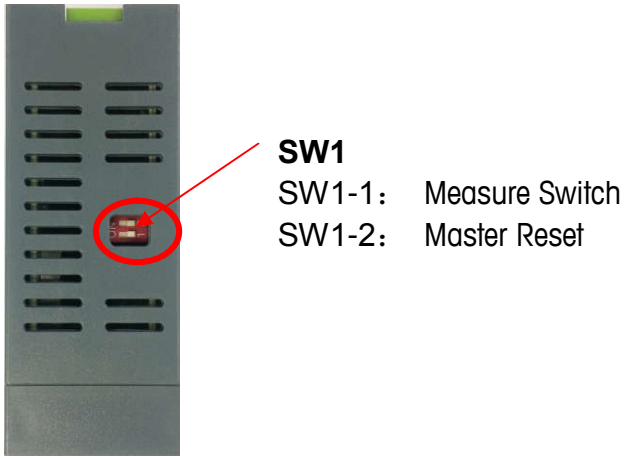


Figure 2-9

2.3.1 Master Reset

Set the all parameters to restore the factory default values, you must use the master reset, in the following cases need to perform the reset：

- Hard to solve the problem of software configuration；
- Forgot the password of entering the settings menu；
- After the hardware update。

The master reset operation steps are as follows：

1. Disconnection of power；
2. Put the SW1-2 to ON；
3, Power on, screen display message shows that asking if we need to implement a master reset；
4. Push the OK，wait to the basic weighing mode；
5. Power off；
6. Put the SW1-2 back to OFF；
7. Power on for the normal status

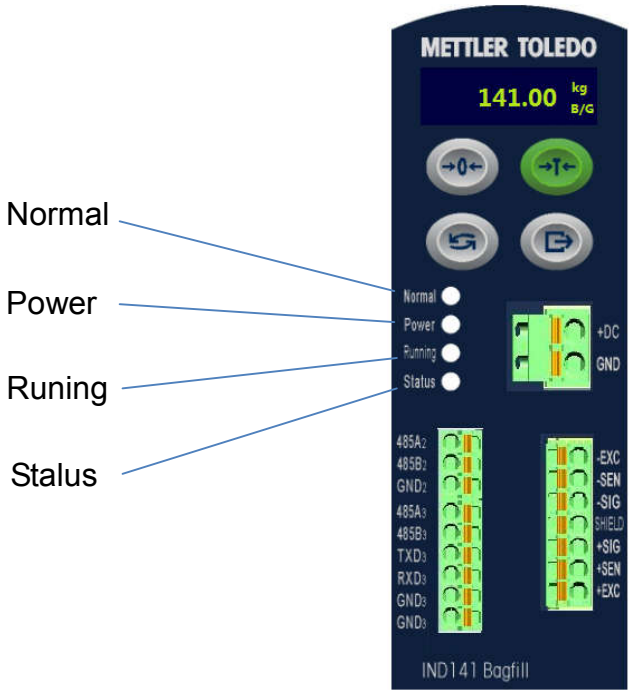
Remark：If put the SW1-1 to ON when master reset，setting-up parameters and calibration parameters will not reset。If SW1-1 is OFF，all parameters will reset。

2.3.2 Measure Switch

Put the switch SW1-1 to ON，IND141Bagfill come to the measure mode,it can not be adjusted the calibration。

3. Operation

3.1 Display and Keypad



There are four state lights on the front panel of IND141Bagfill, specific instructions as follows：

Lights	Description
Normal	Normally on - running normally
	Blink (1 hz) - variable access to remote connection
	Blink (4 hz) -PLC disconnect
Power	power supply indicators
Runing	Light - in the operation of the packaging process
	Blink - suspended packing process
Stalus	Normally on - is in stop mode
	Normally off - The packaging process running normally
	Blink - The packaging process operation error

There are four keypads on the front panel of IND141Bagfill, specific instructions as follows：

Keypads	Description

		Zero
		Tare
		Entry Into Application Parameters Setup Menu
		Entry Into System Parameters Setup Menu

3.2 Basic Operation

3.2.1 Power On

When the IND141 is connected to the power supply, the terminal display will full light, and then the display shows "METTLER TOLEDO"，"IND141Bagfill Bagfill"，"30237662" (software version number).and then a series of self-test, all normal, the controller will return to normal display state. After self-inspection, if IND141 is in good status, the display will be normal working condition.

3.2.2 Zero

Zero command cannot be taken when the scale is in motion or the weight on the scale is out of zero range.

Note:

When the system is in automatically running state, zero also cann't be taken.



Before pushing the Zero button, the display shows as Figure 3-1.



Figure 3-1: Before Zero Operation



After pushing the Zero button, the display shows as Figure 3-2.



Figure 3-2: After Zero Operation

3.2.3 Tare

Note:

When the system is in automatically running state, tare operation cann't be taken.



Before pushing the Tare button, the display shows as Figure 3-3.



Figure 3-3: Before Zero Operation



After pushing the Tare button, the display shows as Figure 3-4.



Figure 3-4: After Zero Operation

3.3 Quick Setting

Push the  button in the normal status，enter the Quick Setting menu

Note: when the packaging process runtime () when the Running light is lit up, will not be able to enter the Quick Setting menu.



The following Quick Setting menu content：

Icon	Description
	Spill Settings
	Calibration

	Self-learning settings
	10 times extension display
	Information

3.3.1 Buttons state

There is different between Quick Setting menu and system parameter Settings menu for 4 keys, respectively, the menu mode (display menu), the edit box mode (edit input value) and a drop-down box model (a drop-down list), please refer to the tables below:

Menu mode

Key	Description
	Return to the top menu
	Switch up the menu
	Switch down the menu
	Enter the lower menu/enter edit mode or a drop-down box

Edit box mode

Key	Description
	Give up and return to the menu mode
	Move the cursor to the right cycle
	Edit cursor digits (0 ~ 9 cycle switch, in some parts of the interface support input point)
	Confirm changes, return to the menu mode and enter the switch to the next menu

Drop-down box model

Key	Description
	Give up and return to the menu mode
	Switch up the menu
	Switch down the menu
	Confirm changes, return to the menu mode and enter the switch to the next menu

3.3.2 Setpoint Setup

When the displayed weight reaches the minus value between target and the setpoint（Displayed Weight = Target Value - Setpoint）, the corresponding output will be changed.

Take three speeds feed as an example:

- ✧ Traget=20kg
- ✧ Fast Feed(SP1)=5kg
- ✧ Fine Feed(SP2)=3kg
- ✧ Spill Value=1kg

Feed start:

- ✧ If displayed value is bigger than 15kg，OUT1 will be invalid，fast feed valve close.
- ✧ If displayed value is bigger than 17kg，OUT2 will be invalid，middle feed valve close.
- ✧ If displayed value is bigger than 19kg，OUT3 will be invalid，fine feed valve close. Amount of material in suspension that will add to the weight after all feeds are shut off

As shown in Figure 3-5, setpoint can be set following blew steps:

1. Push  button，IND141 display shows setpoint setup menu.



Figure 3-5 (a)

2. Push  button again, IND141 will entry Into Target Setup Menu.



Figure 3-5 (b)

3. Push button to edit Target value.



Figure 3-5 (c)

4. Push to edit the biggest bit of Target Value (0-9).



Figure 3-5 (d)

5. Push to move active bit to edit Target.

6. Push to edit the active bit value.



Figure 3-6 (e)

7. Push to set SP1.





Figure 3-7 (f)

8. Push  to set **SP2.**



Figure 3-8 (g)

9. Push  to set **Spill** value.



Figure 3-9 (h)

10. Push  to edit **+Tolerance**.



Figure 3-10 (i)

matters need attention：

For single speed packing, please send SP1, SP2 is set to 0, spill is set to the effective parameters。

Packing for double speed, please send SP1 is set to 0, SP2, spill is set to the effective

11. Push  to edit **-Tolerance**.



Figure 3-11 (j)

parameters

For three speed packing, please send SP1, SP2, spill is set for effective parameters

3.3.3 Calibration and Syetem Configuration

This chapter provides information about how to configure the IND141 terminal's operating system. It describes access to the setup mode, where functions can be enabled, disabled, or defined by entering parameter values in specific setup screens.

Only permit qualified personnel to service the terminal. Incorrect setting may cause IND141 to operate improperly.

3.3.3.1 Setup Menu

Push  button for 3s to enter **Syetem Configuration** setup menu.



Figure 3-1: Enter Into System Configuration

Overview operations in configuration steps:

 Push this key to confirm current selection and move to the next setup menu.

 Push this key to select next parameter.

 Push this key to select above parameter.

 Back to the upper setup menu. If the current menu is the root directory, the terminal will exit configuration automatically.

Note:

When IND141 is in packaging process (Running Light On), this terminal can not access into Configuration Menu.

3.3.3.2 Calibration

1. Push  to select **Setup-Scale**



2. Push  to select **Scale –Calibration** to calibrate scale.

   Then push  to confirm this item to enter detailed setup menu.



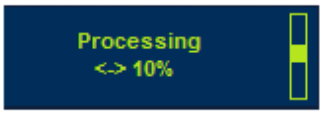
3. Push  to select **Scale –Calibration-Linearity** to enable or disable linearity adjustment.

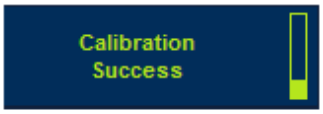


4. Push  to select **Scale –Calibration-Set Zero** to do Zero Calibration. Empty scale and then push  to start Zero Calibration.



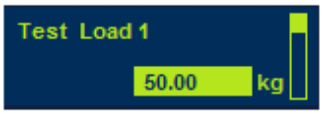




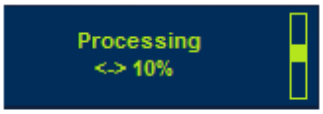


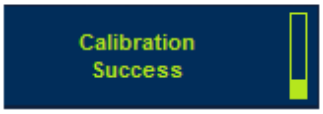
5. Push  to select **Scale –Calibration-Set Span** to do Span Calibration. Use  and  to input capacity value, then load the same weights on the scale.





6. Push  to start span calibration and wait until the display shows calibration success.





3.3.4 Self-learning Setting

IND141Bagfill can be adjusted automatically according to

the mechanical properties of packaging equipment and materials attributes, also can adjust the filter parameters and process parameters. It will create the most optimized parameters after self-learning.

Note:

please operation is only for the professional and technical personnel, the incorrect parameter settings may result in abnormal working of the system

3.3.4.1 Filter Adjustment



Push  to enter the menu of application parameter setting， push  again ， choose the self-learning function of the control Settings icon 



Push  to enter Automatic filter adjustment options



Push  ， to start automatically filter adjustment



Automatic filter adjustment began to run

After completion of each packing will prompt "press ENTER to start", after the completion of the 5 bags will automatically adjust the filter parameter and prompt completion



3.3.4.2 Fast packing parameters self-learning



Push  in the menu of Self-learning to switch to the Fast packing parameters self-learning，and push  to enter it.



Push , to start the Fast packing parameters self-learning



Fast packing parameters self-learning began to run

The IND141Bagfill will start the feed process, after the completion of the automatic adjust packing parameters, it will show prompt completion



3.3.4.3 Accurate packing parameters self-learning

Push  in the menu of Self-learning to switch to the Accurate packing parameters self-learning，and push  to enter it.



Push  to start the Accurate packing parameters self-learning.



Accurate packing parameters self-learning began to run.



After completion of each packing will prompt "press ENTER to start", about 10 package will automatically adjust packing parameters and prompt completion after the completion of Accurate packing parameters self - learning



3.3.5 Expand By 10

The EXPAND BY 10 softkey is used to increase the selected weight display resolution by one additional digit. For example, a weight display of 40.96 could increase by one additional digit to display as 40.958. The Expand By Ten mode is indicated on the display by x10, which displays in the Legend area of the display (Figure 2-5). When the EXPAND BY TEN softkey is pressed again, the display reverts to the normal display of weight.

If the terminal is programmed as approved with the metrology switch (SW1-1) ON, the Expand By Ten mode is displayed for five seconds then automatically returns to normal resolution. Printing is disabled when the weight is expanded and the terminal is programmed as approved.

When the Expand by 10 is available,the icon will show in the display



3.3.6 Information Recall

Press the Information recall softkey to access the recall screen. It shows the specific terminal information. Including the terminal model and serial number and installed software and hardware information.

3.4 Setup Menu Tree

Push  for 3 seconds to enter into the system parameter Settings menu.

Note: when the packaging process running (when the Running light is on), it will not be able to enter the system parameter Settings menu.

IND141 Menu structure

- **Scale**
  - **Type**
  - **Cap & Incr.**
  - **Calibration**
  - **Zero**
  - **Filter**
  - **Stability**
- **Application**
  - **Mode**
  - **Sequence**
  - **Traget**
  - **Upper/lower**
  - **Near Zero**
  - **Time**
  - **Spill**
  - **Totalization**
  - **Input**
  - **Output**
- **Terminal**
  - **Configuration**
  - **Screensaver**
  - **Language**
  - **KB**
  - **User**
- **Commuication**
  - **Com1**
  - **Com2**
  - **Com3**
  - PROFINET (Only PROFINET versions are available)
  - PROFIBUS DP (Only PROFIBUS versions are available)
  - Ethernet/IP (Only Ethernet/IP versions are available)
- **Maintenance**
  - **Loadcell Output**
  - **CAL Valuse**
  - **Statistics**
  - **KB Test**
  - **Serial Test**
  - **I/O Test**
  - **Faults**
  - **Reset**

Table 3-1: Configuration and Setup Defaults

-Scale		
Scale Parameter Setup		
	-Type	
		-name
		Input the scale name
		-Approval
		-None*
		- OIML
	-Capacity & Increment	
		-Unit
		kg * , g , lb ,
		-Capacity
		xxxxxx(60*)
		-Increment
		Increments only can be set in the range 500~100000.
		0.001 0.002 0.005 0.01* 0.02 0.05 0.1
		0.2 0.5 1 2 5 10 20

50 100 200

-Over Capacity

xx(5*)

-Calibration

-GEO

0-31(16*)

-Linearity

*-Disabled 3, 4, 5

-Set Zero

-Set Span

-CalFree

-Cell Unit

g , kg* , lb

- Cell Capacity

xxxxxx(60*)

- Rated Cell Output

x.xxxx(2.0*)mV/V

- Zero

-Power Up Mode

*-Reset - Initial Zero will be Calibrated zero.

-Restart - Initial Zero will be the last metrological zero.

-Under Zero

Blanking of the display is used to indicate an under-zero condition when the weight on the scale falls below the current zero reference. Set the under zero blanking for the number of divisions (d) that the terminal is permitted to go under zero before blanking.

|_ _ _ _ _ _|

0-99d(5d*)

- A value of 99 disables blanking under zero and the terminal will display a weight as far under zero as possible.

-Power Up Zero

-Disabled +/- 2% +/- 10%*

-Pushbuttton Zero

-Disabled +/- 2% +/- 20%*

-Filter

1- Filter 1

1-10(3*)

-Environment

Very Stable Stable* Standard Unstable Very Unstable

2- Filter 2

1-20*(3*)

-Stability

-Disabled* -Enabled

-Stability

-Motion Range

0-99.9d(1.0d*)

-Interval

0-9.9s(0.3s*)

-Timeout

0-99s(3s*)

-Application

-Mode

-Control Mode

*-Sequence

- Comparison

-Filling Mode

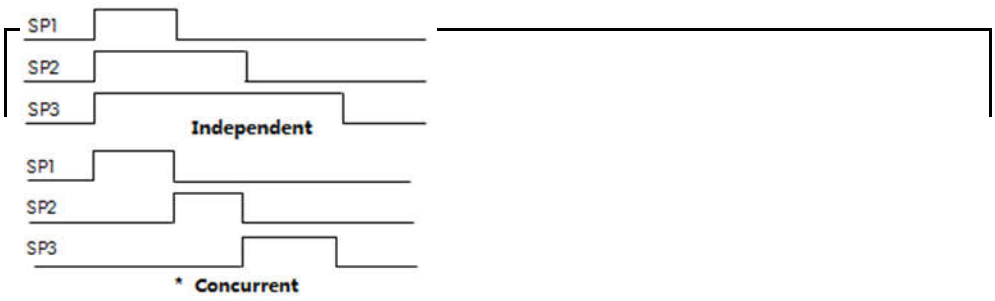
*-Feeding

-Discharging

-Automatic Adjustment

-Disabled* -Enabled

-Output Type



-SP1 Control Mode

-Weighing* -Time

-Complete

0*：Judging time(T2) passed, output ON during **Complete** delay time

1：Judging time passed, output ON during **Complete** delay time if the weight is stable

2：Judging time passed or SP3==ON, output ON during **Complete** delay time if the weight is stable

-Complete weight

0-999999kg

-Sequence

-Adjust Feeding

*-Disabled

-Enabled --When the completed weight is still lower than the target, SP3 will

output ON for seconds till the weight reachs the target.
-NZ Confirm
*-Disabled -Enabled -- Feed process will be active only if the NZ(Near Zero) signal is on.
-SP1 Confirm
*-Disabled -Enabled -- Before the weighing process, terminal will judge the weight. If the weight is larger than SP1, an alarm is outputted.
-AZ Count
After the process start, terminal will automatically clear to zero periodically. 0*-99
-Target
-Source
-Disabled -Gross* -net
-Comparison Mode
*-Regularly --Active when completed output is ON. -Judge Input --Active when received input is ON.
-Upper/Lower
-Source
-Disabled * -Gross -net
-Mode
*-Regularly --Active when completed output is ON. -Judge Input --Active when received input is ON.
-Upper
xxxxx.xx(0*)
-Lower
xxxxx.xx(0*)
-Near Zero
-Source
-Disabled -Gross * -net
-Near Zero
xxxxx.xx(0.5*)
-Time
-Inhibt Time(T1)
0-9.99s(0.5s*)
-Judge Time(T2)
0-9.99s(1.0s*)
-Complete Time(T3)
0-9.99s(1.0s*)
-Adjust Time(T4)
0-9.99s(0s*)

	-SP1 Output Time(T5)	
	0-9.99s（0.5*）	
-Spill		
	-Spill Adjust	
	*-Disabled -Enabled	
	Automatically Adjustment Count	
	0-9*	
	Automatically Adjustment Factor	
	0-9.9(0.5*)	
	Automatically Adjustment Range	
	xxxxx.xx(0.1*)	
-Totalization		
	-Mode	
	-Disabled -Enabled*	
	-Clear	
	1-Clear	
-Input		
	1-Input1	0-None; 1-Clear; 2-Clear totalition; 3-Judge; 4-Pause; 5-Start; 6-Start/Stop; 7-Stop; 8-Tare; 9-Zero
	2-Input2	
	3-Input3	
-Output		
	1-Output1	0-None;1- Complete; 2-Size up; 3-Lower; 4-Stable; 5-Near Zero; 6-Net; 7- Upper;8-Run;9-Fast Feed (SP1);10- Middle Feed (SP2); 11-Fine Feed(SP3); 12-Tol-; 13-Tol+.
	2-Output2	
	3-Output3	
	4-Output4	
	5-Output5	
-Temninal		
Terminal Configuration		
	-Serial Number	
	Input 8 bits Serial Number xxxxxxxx(00000000*)	
	-Screen Saver	
	*-Disabled -1 minute -10 minute -30minute	
	-Language	
	*-English -Chinese	
	-Pushbutton	
	Pushbutton Invalid	
	*-Disabled -Enabled	
	-User	
	-Password Protection	
	*--Disabled -Enabled	
	-Password	

When password is active, 4 bits password should be inputed in the blank to go into setup menu. If this function is active, password is needed to entry into Setup Menu each time.If the username and password are correct, the terminal goes into setup mode.

xxxx(0000*)

-Communiction

-Com1

-Assignment

-None -Continuous *-Modbus RTU -VariableAccess -Front Panel -Demand Print

-Node（Only available in Modbus RTU）

1*-255

-Checksum（Only available in Continuous）

- Disabled* - Enabled

-Baud

1200-115200(9600*)

-Data Bits

7-8*

-Parity

-None* -Even -Odd

- Flow Control

-None* -XON -XOFF

-Com2 (Only available in the RS485 version)

Same with Com1, but it can not support the front display

-Com3 (Only available in the RS485 version)

Same with Com1, but it can not support the front display

PROFINET(Only available in the PROFINET version)

-Format

1 Block Format - 2 Block Format*

-Byte Order

-Automatic* -Big Endian -Little Endian

-Device name（Read Only)

XXXXXX(IND141Bagfill-0001*)

-MAC Address（Read Only)

xx:xx:xx:xx:xx:xx

-IP Address

xxx:xxx:xxx:xxx(192.168.000.002*)

-Subnet Mask

xxx:xxx:xxx:xxx(255.255.255.000*)

- Gateway

xxx:xxx:xxx:xxx(192.168.000.001*)
PROFIBUS DP (Only available in the PROFIBUS DP version)
- Format
- 1 Block Format - 2 Block Format*
-Byte Order
-Automatic* -Big Endian -Little Endian
-Node Address
1*-125
Ethernet/IP (Only available in the Ethernet/IP version)
- Format
- 1 Block Format - 2 Block Format*
-Byte Order
-Automatic* -Big Endian -Little Endian
-MAC Address（Read Only)
xx:xx:xx:xx:xx:xx
-DHCP
- Disabled* - Enabled
-IP Address
xxx:xxx:xxx:xxx(192.168.000.002*)
-Subnet Mask
xxx:xxx:xxx:xxx(255.255.255.000*)
- Gateway
xxx:xxx:xxx:xxx(192.168.000.001*)
-Maintenance
-load Cell Output
xxxxxxxx
-Cal Valus
-Zero Counts
xxxxxxxx
-Test Load 1
xxxx.xxx
-Test Load Raw Counts1
xxxxxxxx
-Test Load 2
xxxx.xxx
-Test Load Raw Counts2
xxxxxxxx
-Test Load 3
xxxx.xxx
-Test Load Raw Counts3
xxxxxxxx

-Statistics	
	-Weighments(Read Only)
	xxx
	-Start Threshold
	1%-100%（90%*）
	-Reset Threshold
	1%-100%（10%*）
	-Zero Commands
	xxxxx（0*）
	-Zero Failures
	xxxxx（0*）
	- Drift Threshold
	1%-100%（10%*）
	-Zero Drift
	xxxxx（0*）
	- Calib Changes
	xxxxx（0*）
-Keyboard Test	
	Test keyboard function. Pushed button will be displayed.
-Serial Test	
	Into the test process, terminal will send a data string "COM X Testing: NN" every 3 seconds, in which X refers to port 1 or 2, NN from 1 to 99 and then cycle. (the count of send operations is displayed in the upper row, and the count of receive operation is displayed in the below row.
-I/O Test	
	In the upper row, 3 circles behind the "INPUT "represent the two input ports. Solid circle represents the active input or input open. The hollow circle represents the passive input or input off. The two circles will real time display the current state of the input 1 and input 2;In the downlink, the four circles behind "OUTPUT" represent the four output ports. Note that the output 4 (the most right) surrounded by a layer of aperture, which represents the output is selected, and its state can be changed by the button Zero and Tare. Push the Tare button to open, push the Zero button to close the output. To select the other output, push the Zero button, the aperture will move to the left.
-Faults	
	- AD Overload
	xxxxx（0*）
	- AD Underload
	xxxxx（0*）
	- Overloads
	xxxxx（0*）
	- Underloads

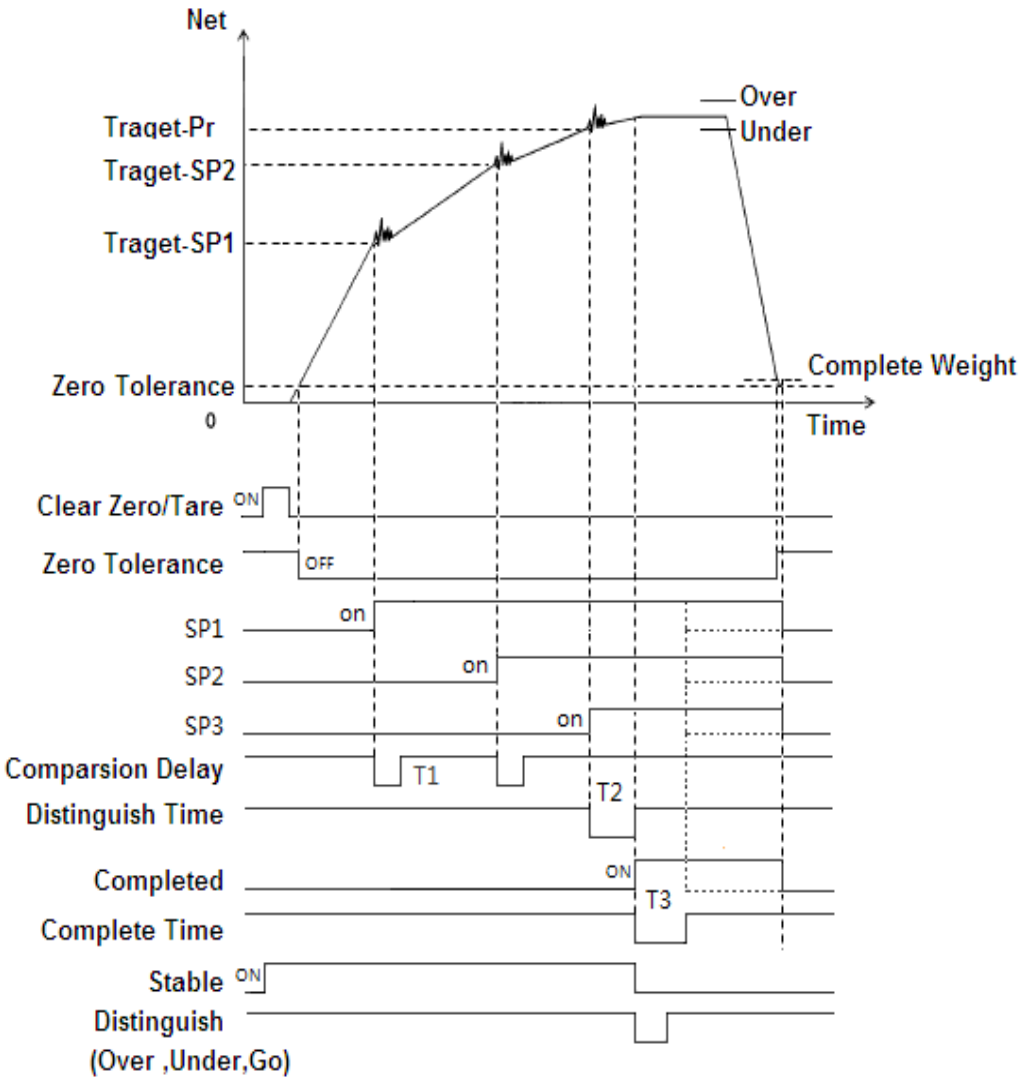
	xxxxx（0*）
	- Watchdog Fail
	xxxxx（0*）
-Reset	
	Use the Reset under the Maintenance branch to restore all setup parameters to factory defaults.

4. Application

4.1 Simple Comparison Mode

The Comparators screen permits the configuration of simple comparators controlled by comparison to a limit value, and used as an assignment for discrete outputs. When the unload weight value of the material meets the conditions of the target unloading value, the output signal turns ON.

In the Simple Comparison Mode, when one weighing process is completed, system wil turn to be active only after delay time pass.

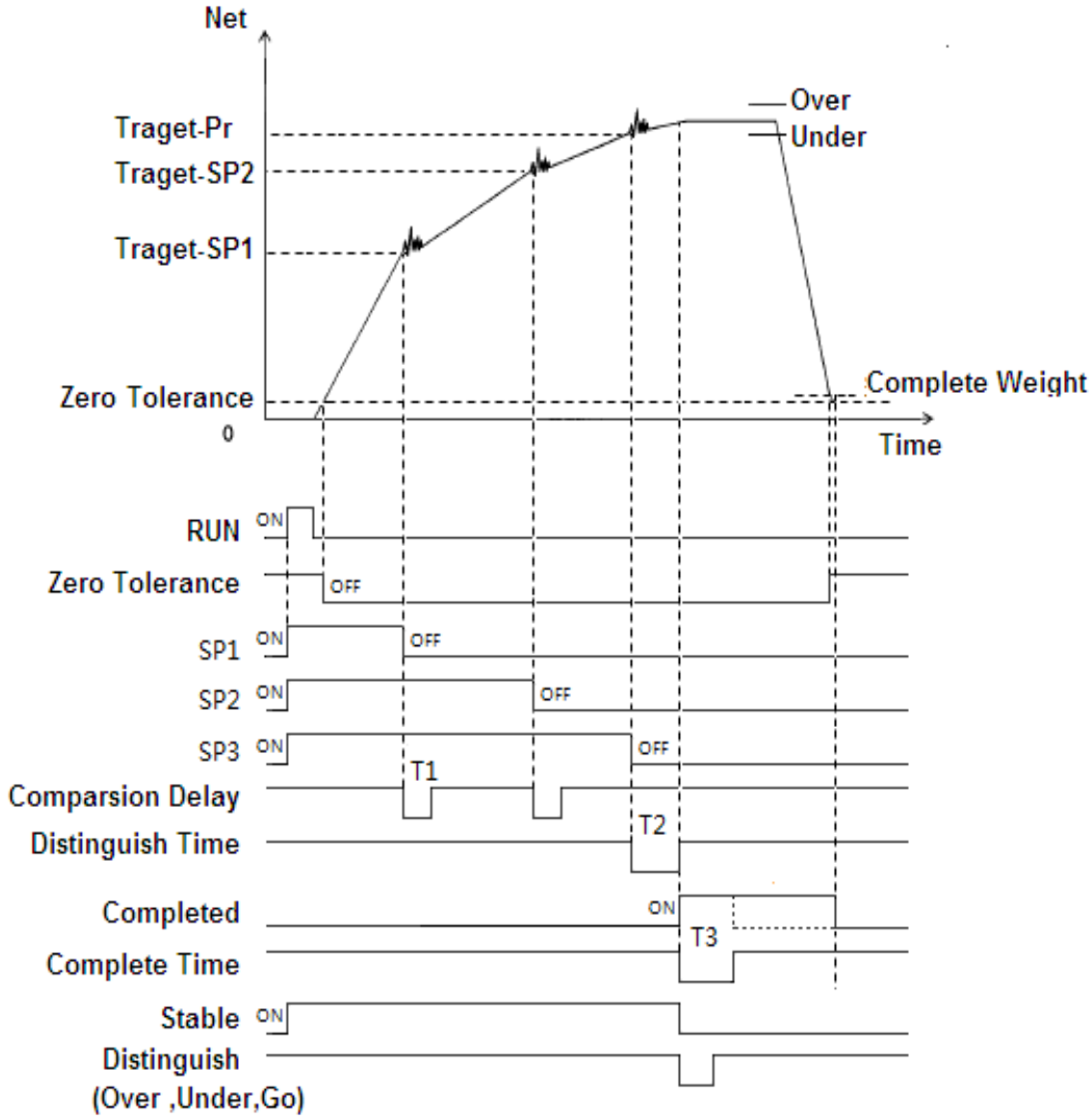


- ✧ Enter parameter setting menu **Appliction ->Mode,** then select **Comparison**
- ✧ Enter parameter setting menu **Appliction ->Complete**, then select Complete Signal Output Mode
- ✧ Set Comparison inhibit time T1 **Appliction ->Time ->Comparison inhibit time**
  Set Judging time T2 **Appliction ->Time ->Judging time**
  Set Complete time T3 **Appliction ->Time ->Complete time**
- ✧ Judging Conditions
  - When weight<=NZ Tolerance, NZ(Near Zero)=ON
    Appliction ->Near Zero->NZ Tolerance
  - When weight>=Target-SP1, SP1=ON
  - When weight>=Target-SP2, SP2=ON
  - When weight>=Target-CPS, SP3=ON
  - When weight>Target-Underload weight, Underload=ON
  - When weight<Target+Overload weight, Overload=ON
  - When Target+Overload>= weight>=Target-Underload, Normal=ON
- ✧ Enter parameter setting menu **Appliction ->Near Zero -> NZ source**, then select item Net
- ✧ Define SP1,SP2,SP3, Complete, Overload, Normal and Underload value in **Appliction ->Output , Appliction ->Input**

4.2 Sequence Comparison Mode

When Start signal in ON, then SP1, SP2, SP3 turn to ON. When the unload weight value of the material meets the conditions of the target unloading value, the specific output signal turns OFF or Complete signal turns ON.

In **Sequence Comparison Mode**, **Adjust Feeding** and **AZ Count** can be enabled.



- ✧ Enter parameter setting menu **Appliction ->Mode,** then select **Sequence**
- ✧ Enter parameter setting menu **Appliction ->Complete**, then select Complete Signal Output Mode
- ✧ Enter parameter setting menu **Appliction->Target-> Comparison Mode**, then select Overload/Underload Judging Mode
- ✧ Set Comparison inhibit time T1 **Appliction ->Time ->Comparison inhibit time**
  Set Judging time T2 **Appliction ->Time ->Judging time**
  Set Complete time T3 **Appliction ->Time ->Complete time**
  Set Adjust Time T4 **Appliction ->Time ->Adjust Time**
- ✧ Judging Conditions
  - When weight<=NZ Tolerance, NZ(Near Zero)=ON
    Appliction ->Near Zero->NZ Tolerance
  - When weight>=Target-SP1, SP1=ON

- When weight>=Target-SP2, SP2=ON
- When weight>=Target-CPS, SP3=ON
- When weight>Target-Underload weight, Underload=ON
- When weight<Target+Overload weight, Overload=ON
- When Target+Overload>= weight>=Target-Underload, Normal=ON

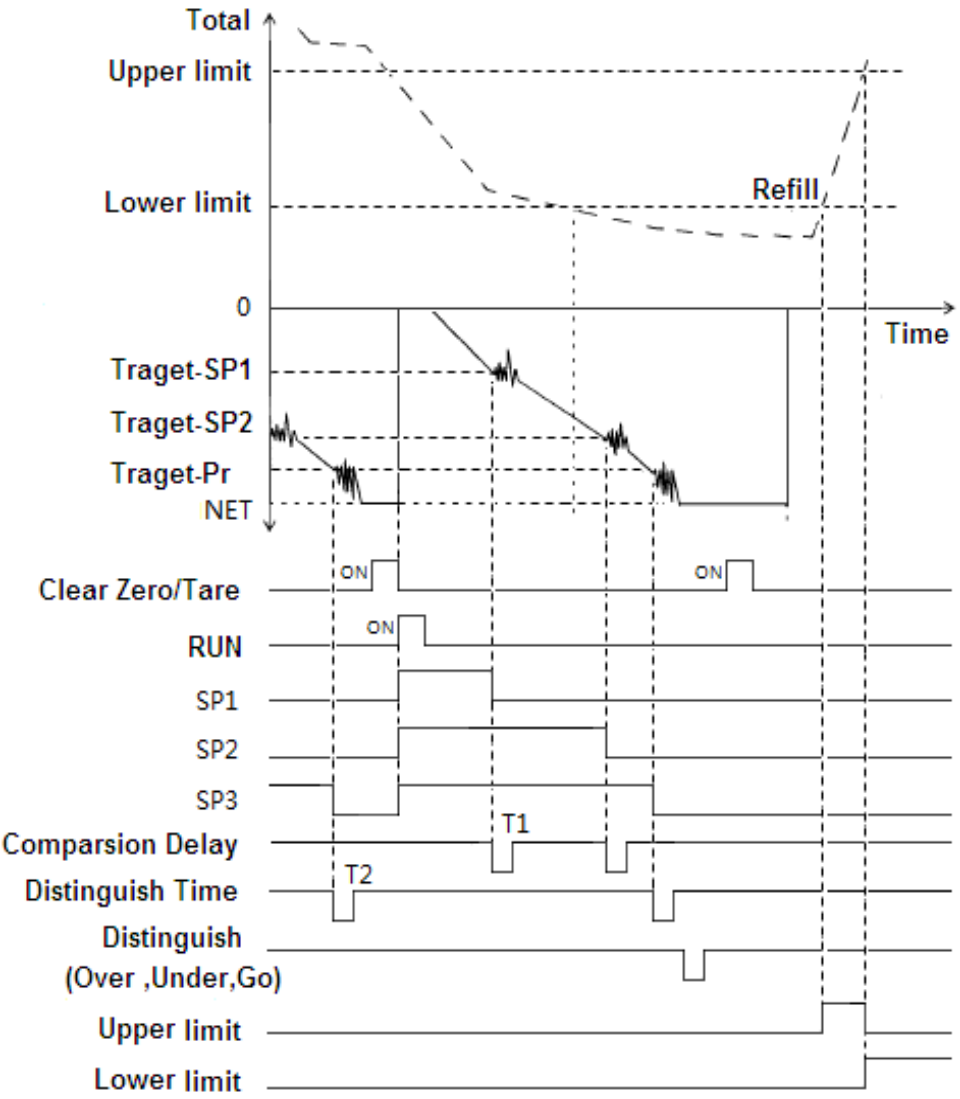
✧ Enter parameter setting menu **Appliction ->Near Zero -> NZ source**, then select item Net

✧ Define SP1,SP2,SP3, Complete, Overload, Normal and Underload value in **Appliction ->Output , Appliction ->Input**

4.3 Reduction Control Mode

In the Reduction Control Mode, the weight of unload material is measured by the accumulated negative weight value. When the material in the bucket is less than a bag, the output signal will be sent to control the feed valve to feed.

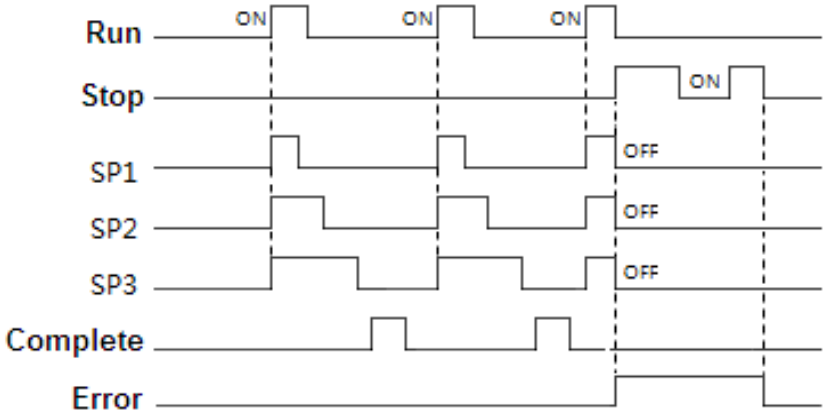
In both Simple Comparison Mode and Sequence Comparison Mode, Reduction Control Mode is available.



4.4 Control process

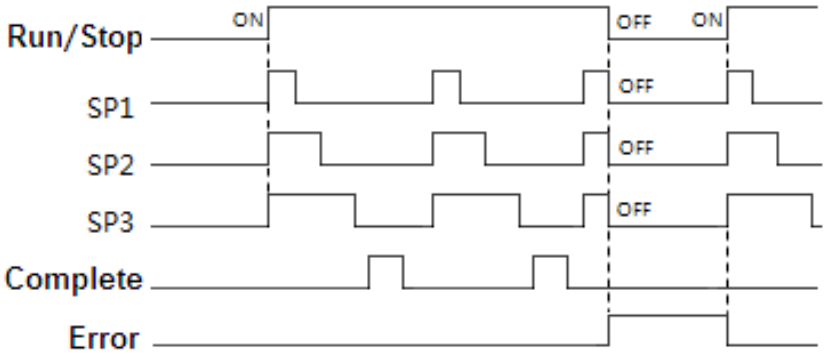
4.4.1 Start/stop/pause (effective in Sequence control mode)

(a)



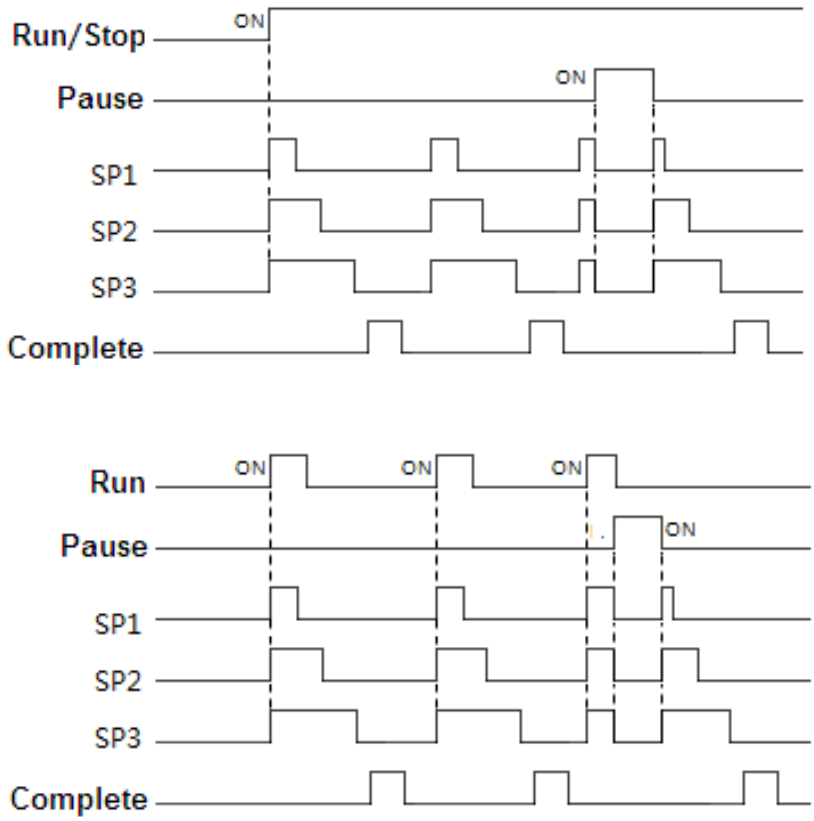
When applications - > input port configuration Settings for the start, the operation signal as the pulse signal
IND141Bagfill receives the high signal to start feeding process
When the stop signal to ON SP1, SP2, SP3 output are OFF and show the alarm "process error 2"
When the stop signal to ON, received new launch signals will produce "process error 1" call the alarm

(b)



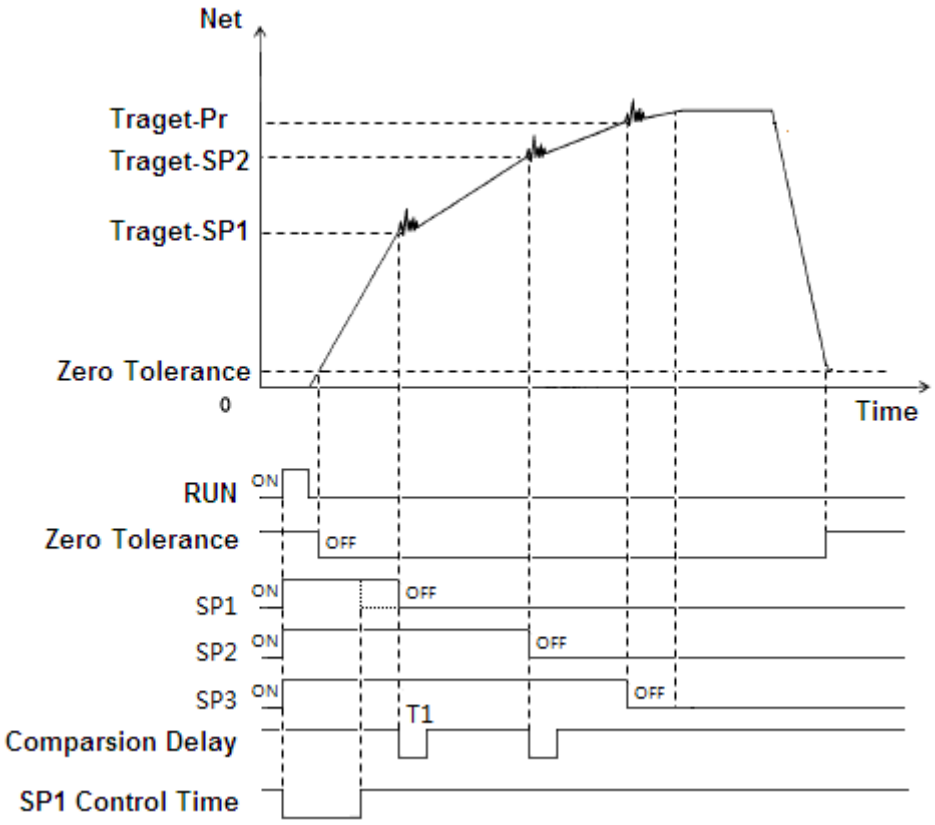
When applications - > input port configuration is set to start/stop, the operation signal as the level signal
IND141Bagfill receives the high signal to start feeding process
When it receives the low signal, SP1, SP2, SP3 output are OFF and will produce "process error 2" call the alarm.

(c)



When applications - > input port configuration Settings to pause, when this signal is high electricity, SP1, SP2, SP3 output are OFF, the process is suspended (running lights flashing), IND141Bagfill will save the packing weight; when the signal is low electricity, the IND141Bagfill will return to the last unfinished packing process and continue.

4.4.2 Feeding sequence



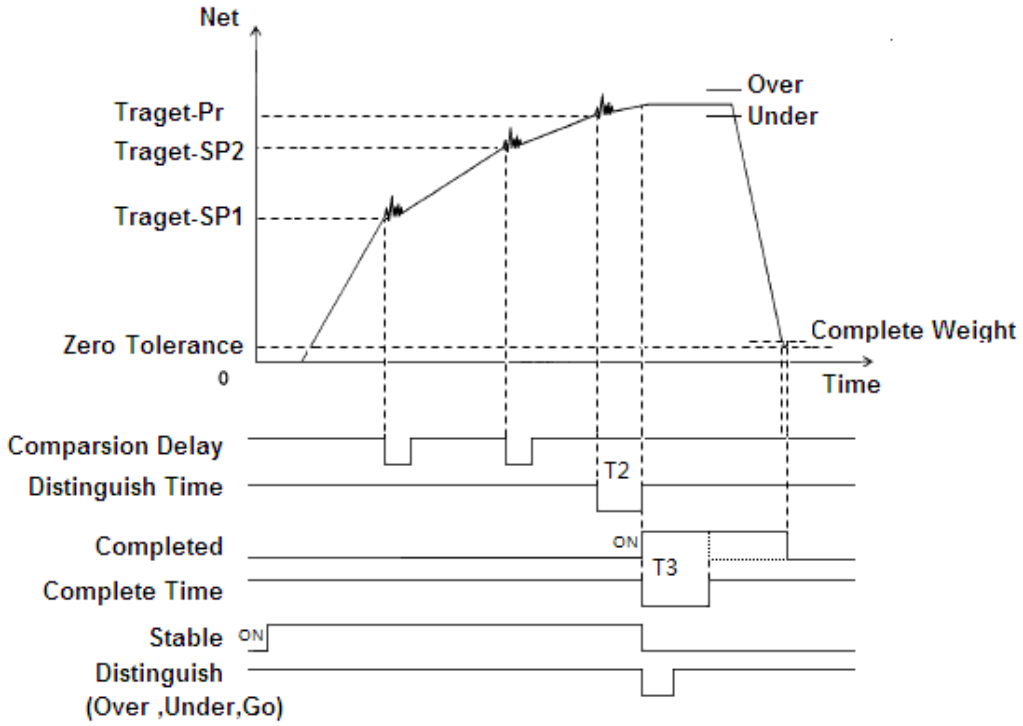
When the SP1 control method via weight, when weight reaches (target weight - SP1), SP1 output is OFF

When SP1 control method via time, when the starting time reaches for SP1 control time, SP1 output is OFF

SP1 feeding end, waiting for the T1 to determine whether the weight to (target weight - SP2)

SP2 feeding end, waiting for the T1 to determine whether the weight to (target weight - spill)

4.4.3 Complete Signal

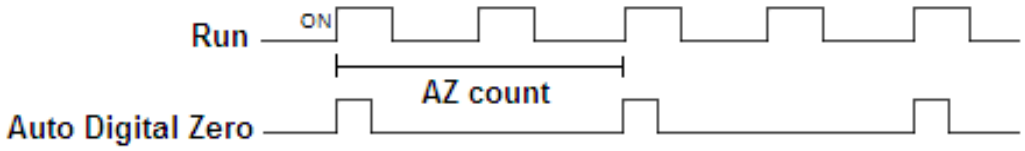


When the T2 time ended, complete signal output to ON, at the same time began to distinguish packing result, upper/lower/Size up for the requirements, it will have the corresponding output

If the setting data of complete signal < 3, the complete signal output will continue to ON, until the T3 time over to change to OFF

If set the weight greater than zero, and the setting data of complete signal >=3, the complete signal output will continue to ON, until the current weight lower than the complete weight to change to OFF

4.4.4 Auto Zero



In - > Applications - > Sequence, when set the Auto Zero(AZ) count > 0, the process start, the IND141Bagfill will automatically reset the wighting data to zero periodically.

Zero range setting in the Scale - > zero - > Pushbutton Zero（2% or 20%）

5. Error Code

Error Code List

Error Code	Description
Remote Connection	Remote Connection
"Remote Calib."	Remote Calibration Status
"UART RX. Overflow"	UART Input Buffer Overflow
"UART RX. Timeout"	UART Timeout
"PLC. Connection\ndisconnected"	PLC Disconnected
"PLC Cable\ndisconnected"	PLC Cable Disconnected
"PLC. Collision"	PLC Collision
"A/D Failed"	AD Failed
"Zero Failed\nMotion"	Zero Failed: Motion
"Zero Failed\nScale in Net mode"	Zero Failed: Scale in Net mode
"Zero Failed\nOut of range"	Zero Failed: Out of range
"Tare Failed\nMotion"	Tare Failed: Motion
"Tare Failed\nValue too small"	Tare Failed: Value too small
"Tare Failed\nZero not captured"	Tare Failed: Zero not captured
"Tare Failed\nOver capacity"	Tare Failed: Over capacity
"Tare Failed\nNegative value"	Tare Failed: Negative value
"Tare Failed\nExceed limit"	Tare Failed: Exceed limit
"Print Failed\nMotion"	Print Failed: Motion
"Print Failed\nOverload"	Print Failed: Overload
"Print Failed\nUnderload"	Print Failed: Underload
"Print Failed\nZero not captured"	Print Failed: Zero not captured
"Print Failed\nIn X10 mode"	Print Failed: In X10 mode
"Print Failed\nNegative weight"	Print Failed: Negative weight
"Sequence Error 1"	In stop state received start signal It needs to push the stop again to esc the stop state
"Sequence Error 2"	Received the stop signal, and to stop state It needs to push the stop again to esc the stop state

"Sequence Error 3"	Periodic zero failed It needs to clear after weighing platform weight or adjust the reset Settings to start signal is given
"Sequence Error 4"	Receive the start signal scale is beyond the scope near zero It needs to remove weight after weighing platform to start signal is given
"Sequence Error 5"	Receives the start signal is greater than the Target weight - SP1 It needs to remove weight after weighing platform to start signal is given
"Sequence Error 6"	Packing parameters setting is wrong

6. Communication

One standard and two optional serial ports are supported with the IND141 terminal. They are designated COM1 (standard port on the main PCB), COM2 (optional), and COM3 (optional).

COM1, a standard serial port on the main board, provides RS-232 interface at communication rates from 300 to 115.2k baud. The RS-232 interface is a three-wire (TDX, RXD, and GND) with XON/XOFF flow-control capabilities (handshaking). Beside RS-232 is a 5V DC excitation pin.
COM2/COM3, only available on the COM2/COM3 version main board, provides RS-232 and RS-485.
PLC, PROFIBUS DP and EtherNet/IP PLC interface can be supported in corresponding version.

6.1 Standard Continuous Output

Continuous Output is also commonly known as MT Continuous or Mettler-Toledo Continuous. The fixed format data output consists of 17 or 18 bytes depending on whether or not the checksum character is enabled or disabled. The checksum is available on all ports. Non-significant weight data and tare data digits are transmitted as spaces. The continuous output mode provides compatibility with METTLER TOLEDO products that require real-time weight data. Table 6- shows continuous format output.

Table 6-1: Continuous Output Format

		Status[2]			**Indicated Weight**[3]						**Tare Weight**[4]							
Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Data	STX[1]	SWA	SWB	SWC	MSD	-	-	-	-	LSD	MSD	-	-	-	-	LSD	CR[5]	CHK[6]

1. ASCII Start of Text character (02 hex), always transmitted.
2. Status words. Refer to Table 6-, Table 6-, and Table 6- for details.
3. Displayed weight. Either gross or net weight. Six digits, no decimal point or sign. Insignificant leading zeroes are replaced with spaces.
4. Tare weight. Six digits of tare weight data. No decimal point in field.
5. ASCII Carriage Return <CR> character (0D hex).
6. Checksum, transmitted only if enabled in setup. Checksum is used to detect errors in the transmission of data. Checksum is defined as the 2's complement of the seven low order

bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> characters.

Table 6-, Table 6-, and Table 6- detail the standard status bytes for standard continuous output.

Table 6-2: Status Word A Bit Definitions

Bits 2, 1, and 0			
2	**1**	**0**	**Decimal Point Location**
0	0	0	XXXXX00
0	0	1	XXXXX0
0	1	0	XXXXXX
0	1	1	XXXXX.X
1	0	0	XXXX.XX
1	0	1	XXX.XXX
1	1	0	XX.XXXX
1	1	1	X.XXXXX
Bits 4 and 3			
4	3		**Build Code**
0	1		X1
1	0		X2
1	1		X5
Bit 5			Always = 1
Bit 6			Always = 0

Table 6-3: Status Word B Bit Definitions

Status Bits	Function
Bit 0	Gross = 0, Net = 1
Bit 1	Sign, Positive = 0, Negative = 1
Bit 2	Out of Range = 1 (Over capacity or Under Zero)
Bit 3	Motion = 1, Stable = 0
Bit 4	lb = 0, kg = 1 (see also Status Byte 3, bits 0-2)
Bit 5	Always = 1
Bit 6	Zero Not Captured = 1

Table 6-4: Status Word C Bit Definitions

Bits 2, 1, and 0			Weight Description
2	**1**	**0**	
0	0	0	lb or kg, selected by Status Byte B, bit 4
0	0	1	grams (g)
0	1	0	metric tons (t)
0	1	1	ounces (oz)
1	0	0	troy ounces (ozt)
1	0	1	penny weight (dwt)
1	1	0	tons (ton)
1	1	1	custom units
Bit 3			Print Request = 1
Bit 4			Expand Data x 10 = 1, Normal = 0
Bit 5			Always = 1
Bit 6			Always = 0

6.2 Communication Setting



Figure 6-1: RS-485/232 Configuration

IND141Bagfill supports MODBUS RTU and the Table 6-5 is Data Address List.

Table 6-5: Data Address List

Address		Note		For mat	R/W	Comment
address	bite					
40001		Gross Weight		float	R	High bit in the front
40002						
40003		Net Weight		float	R	
40004						
40005	4	Weighing Status	under	bit	R	1: Underload
	3		over	bit		1: Overload
	2		zero	bit		1: Zero Centre
	1		motion	bit		1: Unstable 0: Stable
	0		net	bit		1: Net 0: Gross
40006	13	Sequence Status	Err	bit	R	1: the packaging process error (details refer to 40007)
	12		Lower	bit		1: the weight is less than the lower limit value
	11		Upper	bit		1: the weight is greater than the upper limit value
	10		Under	bit		1: Under the super poor
	9		Over	bit		1: Up the super poor
	8		DataOK	bit		1: weight effective (if it is 0 the weight of the 40001 and 40003 are in untrusted condition)
	7		go	bit		1: the packing weight within the tolerance range
	6		complete	bit		1: feed complete
	5		sp3	bit		1: Fast Feed Start
	4		sp2	bit		1: Middle Feed Start
	3		sp1	bit		1: Fine Feed Start
	2		near zero	bit		1: In the Zero Range
	1		Pause	bit		1: In Pause Status
	0		Run/Stop	bit		1: In Running Status 0: In Stop Status
40007		Err Code		int	R	0: no error 1: start in stop state received signal 2: received the stop signal, and to stop state 3: periodic reset failed 4: receive the start signal scale is beyond the scope near zero 5: receive the start signal weight is greater than the SP1

						6: packing parameters setting is wrong
40008	2	Weighing Command	ZERO	bit	R/W	Rising edge enabled
	1		Tare	bit		
	0		Clear Tare	bit		
40009	3	Sequence Command	PAUSE	bit	R/W	
	2		STOP	bit		
	1		START	bit		
	0		Clear Tolerance	bit		
40010		Sequence Data	Target	float	R/W	0--Capacity
40012			SP1	float	R/W	0--Target; If set to 0, SP1 comparator is disable
40014			SP2	float	R/W	0--SP1; If set to 0, SP2 comparator is disable
40016			Spill	float	R/W	0--SP2; If set to 0, SP3 comparator is disable
40018			Tol+	float	R/W	Target < value < Capacity
40020			Tol-	float	R/W	0 < value < Target
40022			NZ Tolerance	float	R/W	0--Capacity
40024		Process Data	The cumulative weight	float	R	
40026			Total package number	long	R	
40028			The packing weight of last time	float	R	
40030			Process completion time	int	R	Unit: ms
40031			Fast Feed Time	int	R	
40032			Middle Feed Time	int	R	

40033			Fine Feed Time	int	R	
40034	2	IO (Input)	in2	bit	R	1: Enable 0:Disable
	1		in1	bit		
	0		in0	bit		
40035	4	IO (Input)	out4	bit	R	1: Output
	3		out3	bit		
	2		out2	bit		
	1		out1	bit		
	0		out0	bit		

Table 6-7: Parameter Setting Address List

Address	Note		Format	R/W	comment
40040	Scale Application Area	Approval Type	short	R/W	0 - None(USA, but illegal for trade);1 - OIML;2 - USA
40041		Unit	short	R/W	0 - lb;1 - kg;2 - g
40042		Capacity	float	R/W	Max:100,000 Min:1
40043					
40044		Increment	short	R/W	0 - 0.0001,1 - 0.0002,2 - 0.0005,3 - 0.001,4 - 0.002,5 - 0.005,6 - 0.01,7 - 0.02,8 - 0.05,9 - 0.1,10 - 0.2,11 - 0.5,12 - 1,13 - 2,14 - 5,15 - 10,16 - 20,17 - 50,18 - 100,19 - 200
40045		Blank over capacity	short	R/W	0--99 Unit: D
40046		Geo Code	short	R/W	0-31
40047		linearity adjust	short	R/W	0 - None;1 - 3 point;2 - 4 point;3 - 5 point;
40048		Power up Zero Mode	short	R/W	0=restart with current zero; 1=reset to calibrated zero
40049		Under Zero Blanking	short	R/W	0--99 Unit: D
40050		Power up Zero	short	R/W	0 - Disabled;1 - ±2%;2 - ±10%;
40051		Pushbutton Zero	short	R/W	0 - Disabled;1 - ±2%;2 - ±20%;
40052	Data Processing	Filter 1	short	R/W	1--10; 1=0.05s,

	Area				10=0.5s
40053		Environment	short	R/W	0 - Very Stable;1 - Stable;2 - Standard;3 - Unstable;4 - Very Unstable
40054		Filter 2	short	R/W	1--20; 1=0.05s, 20=1s
40055		Stable Filter	short	RW	0 - Disable; 1 - Enable
40056		Motion Range	short	R/W	1-99 Unit: 0.1D
40057		Interval	short	R/W	0-10 Unit: 0.1s; 0 means no motion check
40058		Timeout	short	R/W	0 - 99; 0 means don't wait no motion, 1~98 means terminal will wait from 1 ~ 98 seconds for motion before failing, 99 means waiting no motion forever.
40059	Sequence Control Area	Control mode	short	R/W	0 - Sequence mode; 1 - Simple Comparison mode
40060		Filling mode	short	R/W	0 - Feeding mode; 1 - Discharging mode
40061		Output type	short	R/W	0 - Parallel; 1 - Discrete;
40062		Complete	short	R/W	0 - After judging time complete output is ON; 1 - After judging time and scale is stable complete output is ON; 2 - After judging time and scale is stable and SP3 is ON then complete output is ON
40063		Adjust feeding	short	R/W	0 - Disable; 1 - Enable;
40064		Confirm NZ at start	short	R/W	0 - Disable; 1 - Enable
40065		Confirm SP1 at start	short	R/W	0 - Disable; 1 - Enable
40066		Auto Zero count	short	R/W	0 - 99
40067		source	short	R/W	0 - Disable; Over and Under output always OFF. 1 - Gross; 2 - Net;

40068		Comparison mode	short	R/W	0 - Regularly; 1 - Control by judging input;
40069		Upper/Lower source	short	R/W	0 - Disable; Upper and Lower output always OFF. 1 - Gross; 2 - Net;
40070		Upper/Lower mode	short	R/W	0 - Regularly; 1 - Control by judging input;
40071		Upper Limit	float	R/W	Lower < value < Capacity
40073		Lower Limit	float	R/W	0--Capacity
40075		Near Zero source	short	R/W	0 - Disable; NZ output always OFF. 1 - Gross; 2 - Net;
40076		Comparison inhibit time	float	R/W	0.00--9.99(second)
40078		Judging time	float	R/W	0.00--9.99(second)
40080		Complete time	float	R/W	0.00--9.99(second)
40082		Adjust feeding time	float	R/W	0.00--9.99(second)
40084		Auto spill adjustment	short	R/W	0 - Disable; 1 - Enable;
40085		Cycles	short	R/W	1 - 9;
40086		Auto spill range	float	R/W	0--Target
40088		Adjust Factor	float	R/W	0.1 - 0.9
40090		Totalization Mode	short	R/W	0 - Disable; 1 - Enable;
40091		Input1 assignment	short	R/W	0-None; 1-Clear; 2-Clear totalition; 3-Judge; 4-Pause; 5-Start; 6-Start/Stop; 7-Stop; 8-Tare; 9-Zero
40092		Input2 assignment	short	R/W	
40093		Input3 assignment	short	R/W	
40094		Output1 assignment	short	R/W	0-None;1- Complete;
40095		Output2 assignment	short	R/W	2-Size up; 3-Lower;

40096		Output3 assignment	short	R/W	4-Stable; 5-Near Zero; 6-Net;7-Upper;8-Run; 9-Fast Feed (SP1); 10- Middle Feed (SP2); 11-Fine Feed(SP3); 12-Tol-; 13-Tol+.
40097		Output4 assignment	short	R/W	
40098		Output5 assignment	short	R/W	
40099	Terminal Application Area	Screen saver	short	R/W	0 - Disable; 1 - 1 min.; 2 - 10 min.; 3 - 30 min.;
40100		Language	short	R/W	0 - English; 1 - Chinese;
40101		Password Protection	short	R/W	0 - Disable; 1 - Enable
40102		Keypad Disable	short	R/W	0 - Disable; 1 - Enable
40103	PLC	Byte Order	short	R/W	0- Automatically;1- the big end;2- standard
40104		Format	short	R/W	0 - 1 Block； 1－2Block
40105	COM	node Address(Modbus RTU)	short	R/W	1 - 255
40106		Assignment	short	R/W	0 - None; 1 - Standard Toledo Continues; 2 - Modbus RTU; 3- Variable access;4 - Front Panel; 5-Demand Print
40107		Format	short	R/W	TBD
40108		baud	short	R/W	0 - 1200; 1 - 2400; 2 - 4800; 3 - 9600; 4 - 19200; 5 - 38400; 6 - 57600; 7 - 115200
40109		Data bit	short	R/W	0 - 7bit; 1 - 8bit
40110		Parity	short	R/W	0 - None; 1 - Odd; 2 - Even
40111		Flow control	short	R/W	0 - None; 1 - XON/XOFF
40112	Other Serial port	DHCP	short	R/W	0 - Disable; 1 - Enable
40113		IP Address	int	R/W	Setting blank is seperated into 4 strings xxx.xxx.xxx.xxx, in every string there is one bit for data memory
40115		Subnet Mask	int	R/W	

40117		Gateway Address	int	R/W	
40119		Node Address	short	R/W	1 - 125
40120	Calibration Area	Cell Output	int	R	read only
40122		Calibration Changes	int	R	read only
40124		Zero Counts	int	R/W	read/write
40126		Load 1 Weight	float	R/W	read/write
40128		Load 1 Counts	int	R/W	read/write
40130		Load 2 Weight	float	R/W	read/write
40132		Load 2 Counts	int	R/W	read/write
40134		Load 3Weight	float	R/W	read/write
40136		Load 3 Counts	int	R/W	read/write
40138		Load 4 Weight	float	R/W	read/write
40140		Load 4 Counts	int	R/W	read/write
40142	Statistics Area	Weighments	int	R	read only
40144		Start Threshold	int	R/W	read/write(Unit：D)
40145		Reset Threshold	int	R/W	read/write(Unit：D)
40146		Zero Commands	int	R	read only
40148		Zero Failures	int	R	read only
40150		Zero Drift Threshold	int	R/W	read/write (% Capacity)
40151		Zero Drift	int	R	read only
40153		AD Overload	int	R	read only
40155		AD Underload	int	R	read only

40157		Overload	int	R	read only
40159		Watchdog Failures	int	R	read only
40161		Underload	int	R	read only
40163	Exit	ExitSetup	int	W	Write 1 to reset
40164	COM1	Checksum	int	R/W	0 – Disable;1 – Enable;
40165	COM2	Node (Modbus RTU)	int	R/W	1 - 255
40166		Assignment	int	R/W	0 - None; 1 - Standard Toledo Continues; 2 - Modbus RTU; 3-Variable access;4 - None; 5-Demand Print
40167			int		TBD
40168		baud	int	R/W	0:300;1:600;2:1200;3:2400;4:4800;5:9600;6:19200;7:38400;8:57600;9:115200
40169		Data bit	int	R/W	0 - 7bit; 1 - 8bit
40170		Parity	int	R/W	0 - None; 1 - Odd; 2 - Even
40171		Flow control	int	R/W	0 - None; 1 - XON/XOFF
40172		Checksum	int	R/W	0 – Disable;1 – Enable;
40173	COM3	node Address(Modbus RTU)	int	R/W	1 - 255
40174		Assignment	int	R/W	0 - None; 1 - Standard Toledo Continues; 2 - Modbus RTU; 3-Variable access;4 - None; 5-Demand Print
40175			int		TBD
40176		baud	int	R/W	0:300;1:600;2:1200;3:2400;4:4800;5:9600;6:19200;7:38400;8:57600;9:115200
40177		Data bit	int	R/W	0 - 7bit; 1 - 8bit
40178		Parity	int	R/W	0 - None; 1 - Odd; 2 - Even
40179		Flow control	int	R/W	0 - None; 1 - XON/XOFF
40180		Checksum	int	R/W	0 – Disable;1 – Enable;
40181	Process Control	Auto Tune	int	R/W	0 – Disable;1 – Enable;

40182		SP1 Output Mode	int	R/W	0 – Weighing; 1 – Time
40183		SP1 Output Time	float	R/W	0-9.99s
40185		Complete Value	float	R/W	
40187	9	Control Output by Modbus	bit	R/W	Each two bits control one Output bit1,0 for output 1; bit3,2 for output 2; bit5,4 for output 3; bit7,6 for output 4; bit9,8 for output 5; Modbus only can control outputs without process running
	8		bit		
	7		bit		
	6		bit		
	5		bit		
	4		bit		
	3		bit		
	2		bit		
	1		bit		
	0		bit		
40188	Zero Calibration	Zero Calibration	int	W	Write 1 to start
40189	Span Calibration	Linearity	int	R/W	0：Linear， 1: 3 points， 2: 4 points， 3: 5 points
40190		Span1	float	R/W	Set test load of Span1 and start
40192		Span2	float	R/W	Set test load of Span2 and start
40194		Span3	float	R/W	Set test load of Span3 and start
40196		Span4	float	R/W	Set test load of Span4 and start
40198	Enable Calibration Parameters	Validate adjustment	int	R/W	After write 1 to store all parameters and enable, write 0 to give up all parameters
40199	Calibration Status	Adjustment Status	int	R	0 – Calibration Succeed 1 – In process 10–Calibration Compete but in unstable 255 –Calibration fault
40200	CalFree	Loadcell Capacity	float	R/W	Write the load cell parameters
40202		CalFree Loadcell Unit	int	R/W	0 – g 1 – kg 2 – lb

40203		Rated Cell Output	float	R/W	
40205		Do CalFree	int	R/W	Write 1 to enable CalFree，Read the bite: 0-Succeed，255- fault

6.3 PROFIBUS DP & Ethernet/IP (Optional)



Figure 6-2: Profibus DP & Ethernet/IP Configuration

Floating point data **Read** format：

Read（IND141transfer to PLC）				
Bit	**Word0**	**Word1**	**Word2**	**Word3**
0	Floating point data		2 bits form a Sequence Bit, when receive a new command, this word plus 1	Return datatype 00,0000,0000 Gross(Rounding） 00,0000,0001 Tare（Rounding） 00,0000,0010 Net（Rounding） 00,0000,0011 Flow（Rounding） 00,0000,0100 Gross 00,0000,0101 Tare 00,0000,0110 Net 00,0000,0111 Flow
1				
2			Heart beat（this status bit will change to 0 or 1）	
3			Normal data:1, data exception: 0	
4			Application Alarm	
5			Zero	
6			Stable	
7			Net	
8			Unit Transfer	
9				

10		Provide specific device status （e.g. I/O）	00,0000,1000 Unit 00,0000,1001 Increment 00,0001,0100 Target 00,0001,0101 Fine Feed 00,0001,0110 Spill
11			0000 Channel 0 0001 Channel 1 0010 Channel 2 0011 Channel 3
12			
13			
14			
15			Always=0

Floating point data **Write** format：

Write（PLC transfer to IND141）			
Word 0	**Word 1**	**Word 2**	**Word 3**
Floating point data		Data channel	Write command

IND141 Floating point data **Write** command list

Type	Command	Value
Weighing Data	Return Current Weight	0
	Return Gross（Rounding）	1
	Return Tare（Rounding）	2
	Return Net（Roudning）	3
	Return Current Gross	5
	Return Current Tare	6
	Return Current Net	7
	Return Current Unit	9
	Return Current Increment	10
Target Return	Return Current Target	20
	Return Current Fast Feed	21
	Return Current Fine Feed	22
	Return Current Spill	25
	Return Current (–)Tolerance	26
	Return Current (+)Tolerance	27
Error Code	Return Error Code	100
Tare	Write Preset Tare	201

Write Target	Write Current Tare	220
	Write Current Fast Feed	221
	Write Current Fine Feed	222
	Write Current Spill	225
	Write Current (-)Tolerance	226
	Write Current (+)Tolerance	227
	Tare	400
	Zero	401
	Clear	402
	Execute Tare（Not Judge Stable）	403
Print	Print	410
	Start cyclic Tset Mode	8080h
	End cyclic Test Mode	8888h
Keypad	Keypad Lock	632
	Keypad Unlock	633
Discrete Output	Outputs Closed	1000
	Alarm bit	1900
	Motion Status bit	1901
	Net Status bit	1902
	Zero Status bit	1903
	Alt weight bit	1904
	Device bit 1	1905
	Device bit 2	1906
	Device bit 3	1907
	Device bit 4	1908
	Device bit 5	1909
	Device bit 6	1910
	Device bit 7	1911
	Debug Mode 0 = Deliver A/D data 1 = Deliver 1minutes A/D data n = Deliver N minutes A/D data	1912
Status	Report Default Status words Default status words (see below)	0
	Report RedAlert Alarm, Scale Group 2, I/O group 1 RedAlert Alarm, Scale group 2, I/O group 1	1

	Report Target mix 1 Target 1, I/O group 1, custom group 1	3
	Report Alarms & Scale Group 2 RedAlert Alarm, Alarm, Scale Group2	21

Status data **Read** format:

Read（IND141Transfer to PLC）			
Word 0	**Word1**	**Word2**	**Word3**
Status data block1	Status data block2	Status data block3	Response & Data Channel

Status data **Write** format:

Write（PLC transfer to IND141）			
Word 0	**Word1**	**Word2**	**Word3**
Status data block1	Status data block2	Status data block3	Write Command

Status **Write** command:

Report Command	Description	Value
Return Status	Status data block1:Alarm Status Status data block2:Scale Status Status data block3:I/O Status	0
Return Target	Status data block1:Packing Process Status Status data block2:I/O Status Status data block3: Custom Status	3
Return I/O Status	Status data block1:I/O group 2 Status data block2:I/O group 3 Status data block3:I/O group 4	9

Return **Status Data Block** definition:

Bit	Alarm Status	Scale Status	Packing Process Status	I/O Status	Custom Status
0	Calibration Error	Unit: 0000 g 0001 kg 0010 lb 0011 t 0100 ton	Feed Status	In 1	Custom Bit 1
1	Overload or Underload		Fast Feed	In 2	Custom Bit 2
2	Validation Error		Fine Feed	In 3	Custom Bit 3
3	Weight doesn't change in a certain period time		Feed stage 2	In 4	Custom Bit 4
4	Single sensor communication fault	MinWeigh Error	Feed stage 2	In 5	Custom Bit 5

5	Customer defined overload	00 Range/Interval1 01 Range/Interval2 10 Range/Interval3 11 Reserved	Within error range	In 6	Custom Bit 6
6	Customer defined underload		+Tolerance	In 7	Custom Bit 7
7	Network fault	Parameter setting status	-Tolerance	In 8	Custom Bit 8
8	Out of Zero range	Power-up Zero Error	High level	Out 1	Custom Bit 9
9	Symmetry errors	GWP out of Tolerance	Low level	Out 2	Custom Bit 10
10	Temperature error	Capacity Selection	Always=0	Out 3	Custom Bit 11
11	Weights-and measures failure	Always=0	Always=0	Out 4	Custom Bit 12
12	Foreign-device detected	Always=0	Always=0	Out 5	Custom Bit 13
13	Debug Mode	Always=0	Always=0	Out 6	Custom Bit 14
14	Always=1	Always=0	Always=0	Out 7	Custom Bit 15
15	Always=1	Always=0	Always=0	Out 8	Custom Bit 16

7. Default

Name		Default		Name		Default	
Type				Upper/Lower			
	Name	None			Source	Disabled	
	Approval	None			Mode	Regularly	
Capacity &Increment					Upper	0	
	Unit	kg			Lower	0	
	Capacity	60		Near Zero			
	Increment	0.01			Source	Disabled	
	Over Capacity	5			Near Zero	0.5	
Zero				Time			
	Power Up Mode	Reset			Inhibt Time	0.5s	
	Under Zero	5			Judge Time	1. 0s	
	Power Up Zero	10%			Complete Time	1. 0s	
	Pushbuttton Zero	20%			Adjust Time	0s	
Filter					SP1 Output Time	0.5s	
	Filter 1	3		Spill			
	Environment	Stable			Spill Adjust	Disabled	
	Filter 2	3			Automatically Adjustment Count	9	
	Stability	Disabled			Automatically Adjustment Factor	0.5	
Stability					Automatically Adjustment Range	0	
	Motion	1.0d		Totalization			

	Range						
	Interval	0.3s			Mode	Enabled	
	Timeout	3 s			Clear	0	
Mode				Input			
	Control Mode	Sequence			1-Input1	Start	
	Filling Mode	Feeding			2-Input2	Stop	
	Automatic Adjustment	Disabled			3-Input3	Pause	
	Output Type	Concurrent					
	SP1 Control Mode	Weighing		Output			
	Complete	0			1-Output1	sp1	
	Complete weight	0			2-Output2	sp2	
Sequence					3-Output3	sp3	
	Adjust Feeding	Disabled			4-Output4	Complete	
	NZ Confirm	Disabled			5-Output5	Size up	
	SP1 Confirm	Disabled		Terminal			
	AZ Count	0			Serial Number	None	
Target					Screen Saver	Disabled	
	Source	Gross			Language	English	
	Comparison Mode	Regularly			Pushbutton	Enabled	
User							
	-Password	/					
Com1							
	Assignment	ModbusRTU					
	Baud	9600					
	Data Bits	8					
	Parity	None					
	Flow Control	None					

The Mettler-Toledo factory that developed/manufactured/tested this product has passed:

- ISO9001 Quality Management System certification
- ISO14001 environmental management system certification
- GB/T28001 occupational Health and Safety Management System Certification

(Cover OHSAS18001 standards for all the technical content).

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