

# TI-1500VC

## Weighing Transmitter

### Setup / Operation Manual

Ver 3.5C

2018-05

#### Transcell Technology, Inc.

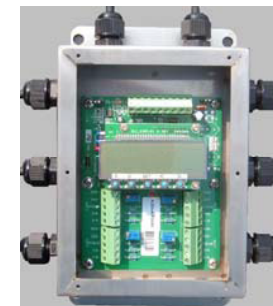
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## 1. TI-1500VC Specifications

### (1) Analog Signal Input:

The transmitter can drive 4 x 350Ω load cell. The signals input every channel can be adjusted. The excitation voltage is +5V.

### (2) Interface:

- a. 4—20mA analog output (with digital adjust)
- b. 0—10V analog output (with digital adjust)  
These two output channels can not use in the same time, you should choose one output channel to operate.
- c. Communication port: RS485

### (3) Weighing Resolution: III

Except 4-20mA & 0-10V output

### (4) Display / Keyboard

7-segment, LCD;

1 LED annunciator

5 keyboards

### (5) Function:

Auto zero track, Digital Filter, Digital Calibration, Keep Peak Value

### (6) Sampling Rate: 100Hz

### (7) Rated Voltage: DC 15V ± 10%, 500mA

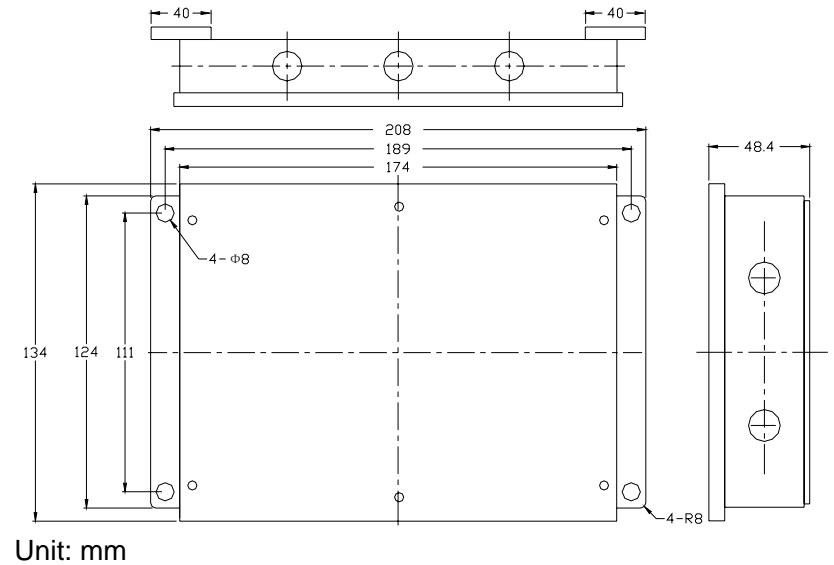
### (8) Power: <=4W

### (9) Operating Temperature: -10°C--+55°C

### (10) Enclosure: Stainless steel & water proof

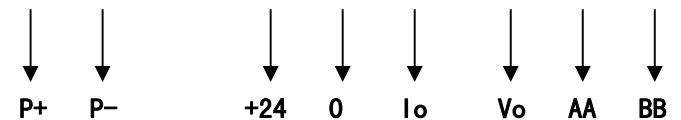
## 2. Dimensions & Installation

### 2.1 TI-1500VC Dimension:



### 2.2 Installation:

#### TI-1500VC Connection Assignment



The power terminal, Analog Signals output and Communication port locate the upper of the display, mark J2. Total 8 connect terminals. Use slotted screwdriver clockwise tension.

Follow is the definitions of the connect terminals:

Maker	Definition	Description
P+	Positive for DC Power	DC 15V±10%, 500mA <b>Note: Please connect Power +/- correct.</b>
P-	Negative for DC Power	
+24	Analog Single ( 0-10V/4-20mA) drive power+ ( Exterior power)	Power standard: DC 15~24V <b>If using this power supply to analog single current, please open J3.</b>
0	Common port	a. Analog single drive power- b. With I <sub>o</sub> or V <sub>o</sub> compose signal loop.
I <sub>o</sub>	4-20mA output Single	With Common port compose signal loop. Output range: 0~24mA
V <sub>o</sub>	0-10V output Single	With Common port compose signal loop. Min. load resistance: 10KΩ
AA	RS485 in-phase input/output	When several TI-1500VC are in one network, the last TI-1500VC's J4 should be in short circuit, RS-485 terminal resistance is enable.
BB	RS485 re-phase input/output	

### 3. TI-1500VC Setup Menu

#### 3.1 System menu (F menu)

The section provides more detailed descriptions of the selections found in the system menu chart (F menu).

Factory-set (F21) defaults are shown in bold with a checkmark ( ✓ ).

#### F menu

Name/Code	Description	Code/Value
F1 Graduation	Specifies number of full-scale graduations. Value should be consistent with legal requirements and environmental limits on the useful system resolution.	500 1000
		1500 2000
		2500 3000
		4000 <b>5000</b> ✓
		6000 8000
		10000 12000
		20000 30000
40000 50000		
F2 Span Gain	Span Gain is related to A/D integration time. The larger the span gain, the higher the internal resolution, but the slower the update speed. Note that the scale must be re-calibrated whenever this parameter is altered. See Appendix C for more information.	25 50
		75 100
		<b>150</b> ✓ 200
F3 Zero Track Band	Selects the range within which the scale will automatically zero. Note that the scale must be in standstill to automatically zero. Selections are in Display Divisions.	<b>OFF</b> ✓
		0.5d 1d 3d
		4d 5d 6d
		7d 8d 9d

F4 Zero Range	Selects the range within which the scale may be zeroed. Note that the indicator must be in standstill to zero the scale.	1.9 <b>2</b> ✓ 100
F5 Motion Band	Sets the level at which motion is detected by comparing the present display update with the previous one.	<b>1d</b> ✓    3d 5d        10d
F6 Digital Filter	AUTO: Auto Digital Filter FAST: Fast Filter 8: More Stability 16: Most Stability	AUTO    FAST 8 <b>16</b> ✓
F6A Digital Filter	Average Value Filter	16 <b>32</b> ✓    48 64
F7 Overload Limit	Selects the desired formula which determines the point at which the indicator shows overload. All selections are based on the primary unit selected in F8. "FS"=Full scale in primary units Overload display "□□□□□□"	FS <b>FS+2%</b> ✓ FS+1d FS+9d
F8 Calib. Unit	Selects the primary base unit to be used in the calibration process. Also the default unit for normal operation.	1-lb <b>2-kg</b> ✓
F9 Display Divisions	Determines the desired weigh increments. Value should be consistent with legal requirements.	<b>div-1</b> ✓ div-2 div-5

F10 Decimal Pt.	Determines location of the decimal point.	<b>0</b> ✓    0.0 0.00    0.000 0.0000 00
F14 Disable the lb/kg key	Allows the lb/kg key to be disabled so that an operator cannot accidentally press the key and change the displayed units.	<b>Cr-DIS</b> ✓ Cr-EnA
F15 Zero Range when Power on	Selects the zero range when the system power on.	<b>OFF</b> ✓ (±)10% 100%
F16 Zero Calibration	Places the system into the zero calibration routine.	Press <b>ZERO</b> key to begin sequence
F17 Span Calibration	Places the system into the span calibration routine.	Press <b>ZERO</b> key to begin sequence
F18 View Calibration	Actuates the function that allows you to view both the zero and span calibration value. The values displayed in this function are valid only after Calibration (F16 & F17) has been successfully completed.	Press <b>ZERO</b> key to show zero value; Press "→" key to show span value.

F19 Key-in Zero	Allows you to key-in known zero calibration value in case of memory loss in the field.	Press <b>ZERO</b> key to begin sequence
F20 Key-in Span	Allows you to key-in a known span calibration value in case of memory loss in the field.	Press <b>ZERO</b> key to begin sequence
F21 Factory Reset	This sub-menu will reset all parameters to the default settings. <b>USE WITH CAUTION.</b>	Press the <b>ZERO</b> key twice to execute.
F23 DA Output Type	Selects the Analog Output type: 4-20mA or 0-10V	<b>Aout-C</b> ✓ Aout-V
F24 DA Output Enable	Allow/Forbid analog output (4-20mA or 0-10V)	DA-dIS <b>DA-EnA</b> ✓
F25 DA Digital Adjust	Adjusts the analog output value.	Press <b>ZERO</b> key to begin sequence

### 3.2 User menu

Changing communication mode and formula is in this menu.

#### A menu

Name/Code	Description	Code/Value
A1 Baud Rate	Selects the baud rate for data transmission through the serial port.	1200 2400 4800 9600 <b>19200</b> ✓
A2 Data Bits and Parity	Selects the number of data bits and parity of serial transmission.	<b>8n</b> ✓ 7O 7E 7n
A3 Mode of Serial Transmission	Selects when data will be sent out of the serial port to a printer or computer: "C"=Continuous mode "d"= Demand mode	<b>d</b> ✓ C
A4 Display Check	Actuates the function that illuminates all digit segments, decimal points, and LCD annunciators in a test sequence.	Press <b>ZERO</b> key to begin sequence
A5 ID No. Entry	Settings the Signal resource, when more than one device in one net.	[01-32] <b>01</b> ✓
A20 Enable ZERO key in unstable	Allow/Forbid use ZERO key to clear zero when the system is in unstable state.	<b>rZ-dIS</b> ✓ rZ-EnA

## 4. Operation

### 4.1 Keyboard

TI-1500VC is utilized SMD mini-keyboard, easy to use. In different mode, the keyboards have different function:

#### Function Keys Layout



SW1 SW2 SW3 SW4 SW5  
 ↑ ↓ SET ← →

#### Definitions of keys function

Keyboard	Setting Mode	Weigh Mode (Press)	Weigh Mode (Keep Press)
SW1	↑ Back to Main menu or increase value	Kg/lb Change units	-----
SW2	↓ Enter Sub-menu or decrease value	>0< Set the indicator display zero.	-----
SW3	SET Save the setting value	-----	-----

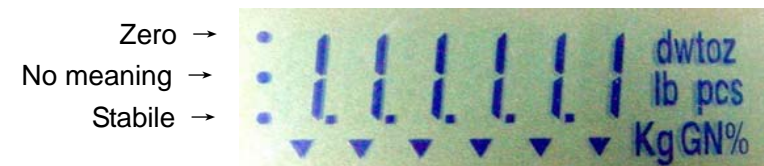
SW4	← Display the next sub-menu or move left	-----	-----
SW5	→ Display the next sub-menu or move right	PRINT Print information	Enter HOLD Mode

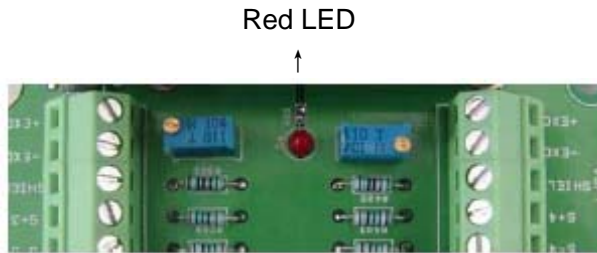
- \* 1. Press and Hold "SET" key while system power on, until the display show [F1], enter setting mode. Turn off the system, then turn it on again, the system back to normal weigh mode.
- 2. In F or A menu mode, press and hold "↑" key, back to normal weigh mode.

### 4.2 Display and Annunciator

TI-1500VC is utilized a blue 7-segments LCD display. Follow is the display detail:

#### TI-1500VC LCD display





In normal weigh mode, the LED is flickering: the flicker frequency is almost 2Hz in zero, the flicker frequency is almost 1Hz in other weight; in setting mode, the LED lightens or black out.

### 4.3 TI-1500VC Calibration

**Note: Every TI-1500VC has Factory Reset (F21) when it out of the factory. The 4-20mA and 0-10V has been adjusted, so the user shouldn't repeat F21, otherwise the analog output should be adjusted again.**

#### 4.3.1 Calibration

Example: The system result:  $3000 \times 0.1\text{kg} = 300\text{kg}$

- (1) Graduations: Enter setting mode, the display show [F1]. Press “↓” key enter, the display show [xxxxx], if now the value is [3000], press “↑”, back to the main menu. Otherwise, press “→” or “←” key, until the display show [3000], press “**SET**” to save the change. Then press “↑”, back to the main menu, the display show [F1] again.
- (2) Display Divisions: Press “→” key, until the display show [F9]. Press “↓” key enter, the display show [div x], if now the value is [div 1], press “↑”, back to the main menu. Otherwise, press “→” or “←” key, until the display show [div 1], press “**SET**” to

save the change. Then press “↑”, back to the main menu, the display show [F9] again.

- (3) Decimal Point: Press “→” key, until the display show [F10]. Press “↓” key enter, the display show [xxx], if now the value is [0.0], press “↑”, back to the main menu. Otherwise, press “→” or “←” key, until the display show [0.0], press “**SET**” to save the change. Then press “↑”, back to the main menu, the display show [F10] again.
- (4) Zero Calibration: Press “→” key, until the display show [F16]. Make sure there are no test weights on the platform, press “↓” key enter, the display show the present zero A/D count. When the stable annunciator turns on, press “↓” key to set zero point, then press “**SET**” key to save the zero value.
- (5) Span Calibration: Press “→” key, until the display show [F17]. Place the full capacity test weight on the platform, press “↓” key enter, the display show flash [ 0], press “←” key 3 times, the display show [ 0000], press “↑” input [3], now the display show [3000], it's equal to the test weight. When the stable annunciator turns on, press “**SET**” key to save the span value.

Now finishing the calibration, turn off the system. Then turn it on again, the system back to the normal weigh mode.

#### 4.3.2 Adjust the Zero Track Band (F3)

Zero Track Band means in stable state the system will automatically zero within the setting zero track range. The system's default zero track value is 1d. If the system use in large wind environment or there will be some residues leave on the platform every weight, the zero track parameter should be



increased according the fact.

Note:

Zero Track Range will effect the manual zero range. The larger zero track range, the smaller the manual zero range. After run zero track several times, it will lead to manual zero disable.

#### 4.3.3 Adjust the Manual Zero Range (F4)

The function is being operated the derivar by manual zero clear. The manual zero range is according to F4 value.

#### 4.3.4 Adjust the Auto Zero Range (F15)

The function is made derivar to zero, when the system power on.

Note: If using in bucket scale system, the F15 value should be set [OFF], its means when the system power off or restart, the system will not be to zero automation.

#### 4.3.5 Adjust DA (F25)

The analog output 4-20mA and 0-10V has been adjusted, when the TI-1500VC out of the factory. The parameter should not be adjusted again generally. If necessary, please follow the step:

- (1) Enter F23 to select the type of analog output.
- (2) Install the test circuit. (Command: connect to the device directly.)
- (3) Enter F25, press “↓”, the display show the present DA value (0V or 4mA) [xxxxx]. Adjust way:
  - [↑] key: Rough adjust. Press once, the value increase 50;
  - [↓] key: Rough adjust. Press once, the value decrease 50;
  - [SET] key: Save the value. Or when the present value is not

adjusted, press [SET] Key into next vale sub-menu.

[←] key: Fine adjust. Press once, the value increase 1;

[→] key: Fine adjust. Press once, the value decrease 1.

Note:

When F23=Aout-C, F25 can adjust follow item:

DA 0 → 4mA adjust

DA 1 → 20mA adjust

DA\_ \_ \_ \_ → 2mA adjust ( Lowest weight mark port current )

DA□□□□ → 22mA adjust (Highest weight mark port current )

When F23=Aout-V, F25 can adjust follow item:

DA 0 → 0V adjust

DA 1 → 10V adjust

DA\_ \_ \_ \_ → -0.04V adjust ( Lowest weight mark port current )

DA□□□□ → 10.8V adjust (Highest weight mark port current )

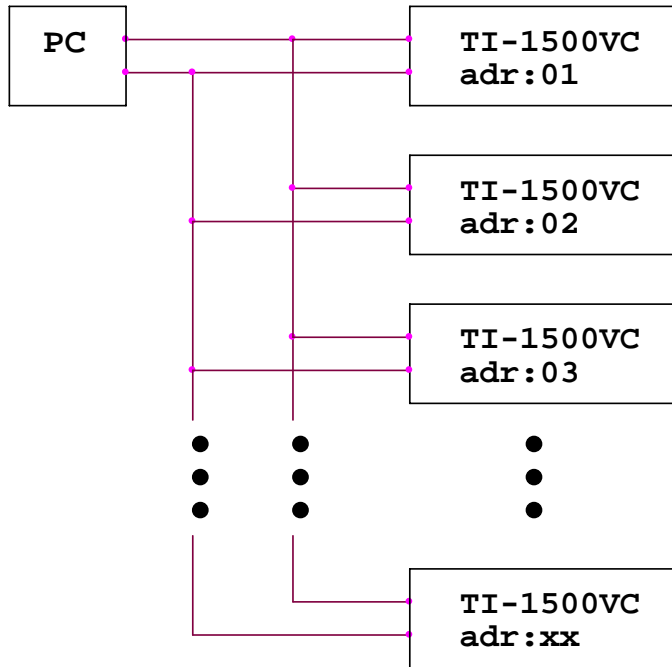
## 5. RS485 communication port

### 5.1 Connecting the RS485 output

a. Point to Point



b. Point to Multi-point



### 5.2 Communication Mode for RS485

(a) Continuous mode: send data continuously

STX	NULL	Device Add.	Operate Command	CR	LF
-----	------	-------------	-----------------	----	----

(b) Demand mode: send data when a PRINT command is issued from the peripheral equipment.

STX	Add.	I/O	Weight Data	Weight Units	State	Parity bit	CR	LF
-----	------	-----	-------------	--------------	-------	------------	----	----

### 5.3 Data Format ( TI-1500VC Vision:V3.5c)

Start Transmission (1 bit): STX;

Device Address (2 bits): Address information;

I/O port state (3 bits): I/O port state information;

Weight Data (8 bits): Symbol (1 bit) + Decimal Point (1 bit) + xxxxxx (6 bits, integer type);

Weight Units (1 bit): K-kg, L-lb

State (1 bit): 0-Overload, M-Motion, H-Hold, S-Stability;

Parity bit (1 bit): The low-byte of the sum of Device address, I/O port state, Weight Data, Weight Units and State;

End symbol (2 bits): CR+LF

Note:

Weight Data, the definition of the decimal point:

0 ---- No decimal point (Integer)

1 ---- Number with one decimal place

2 ---- Number with two decimal place

3 ---- Number with three decimal place

4 ---- Number with four decimal place

8 ---- No decimal point (Integer)

## 5.4 Command Format

Device Address (2 bits): When the device address is less than 10 bits, please add 0 in front of the address.

Operational command (2 bits):

GD: Get weight data;

GC: Get calibration information;

GP: Get equipment address information;

GV: Get software vision;

GS: Get TI-1500VC factory series No;

CC: Transmit Units;

CH: Enter/Exit Hold Mode;

CZ: set the system to display zero.

## Hardware Vision Explain:

Show as follow figure. There is a hardware's mark label paste near the power terminal. So the different PCB board which marks different sign can not be changed. Otherwise the TI-1500VC will be destroyed. If the transmitter out of operate because of the hardware error, please take it back to the factory, don't repair it by yourself.

