

*Innovative Measurement Electronics*



**PT Ltd.**

**PT200MI**  
**Digital Indicator**  
**Instruction Manual**

Rev. 2015/03.1

# CONTENTS

1	DESCRIPTION	
1.1	Introduction.....	1
1.2	Definitions.....	1
1.3	Features.....	2
2	SPECIFICATONS.....	3
2.1	General.....	3
2.2	Digital section.....	3
2.3	Analogue section.....	3
2.4	RS232/RS485 output (optional).....	3
2.5	HI/LO set point output (optional).....	4
2.6	BCD output interface (optional).....	4
2.7	Analogue output interface (optional).....	4
2.8	Input interface (optional).....	4
2.9	Single Material Batching option.....	4
3	OPERATION	
3.1	General rules.....	5
3.2	Input sensitivity of load cells.....	5
3.3	Connecting the load cell to the indicator.....	5
4	INDICATOR AND KEYS	
4.1	Indicator.....	6
4.2	Front panel description.....	6
4.3	Rear panel description.....	7
5	FUNCTION SETTING	
5.1	Data setting.....	9
5.2	Function setting using the RS232/RS485 port (optional).....	12
6	CALIBRATION	
6.1	Notes during span setting.....	17
6.2	Setting steps.....	17
6.3	Error codes during calibration.....	18
6.4	Calibration using the RS232/RS485 port (optional).....	18
7	DISPLAYED AND OUTPUT VALUES.....	21
8	INPUT/OUTPUT	
8.1	Input.....	22
8.2	Comparator output (optional).....	23
8.2.3	Comparator set-point setting.....	24
8.3	RS232/RS485 input/output (optional).....	27
8.4	BCD data output interface (optional).....	29
8.5	Analogue output interface (optional).....	30
9	DIMENSIONS.....	31
10	APPENDIX	
10.1	PT200MI 110V and 220V setting.....	32
10.2	Installing the RS232/RS485 serial option.....	33
10.3	Installing the comparator output option.....	33
10.4	Installing the 0~5 V analogue output option.....	33
10.5	Installing the 0~20/4~20 mA analogue output option.....	33
10.6	Installing the BCD output option.....	33
10.7	Single material batching control software (optional).....	34
10.8	Standard ASCII code table.....	37
10.9	PT200MI function list.....	38

**Note.** Items marked (optional) are optional features that can be purchased with the PT200MI

Refer to our web site at [www.ptglobal.com](http://www.ptglobal.com) for the latest information and revisions.

# 1. DESCRIPTION

## 1.1 INTRODUCTION

The PT200MI is a general weighing indicator, employing the latest technology for reliability, best performance, quality assurance and cost effective design which includes many functions. The PT200MI is suitable for all kinds of applications such as hopper and platform weighing.

## 1.2 DEFINITIONS

### Multiplier:

The multiplier determines the position of the decimal point or the number of trailing zeros added to the internal count or reading.

For example:

If the internal reading is 234,

<u>Multiplier</u>	<u>Display on indicator</u>
10	2340
1	234
.1	23.4
.01	2.34
.001	.234
.0001	.0234

### Division:

The ratio of step width to multiplier. The value of the division can only be one of the following: 1, 2, 5. The external count increments by the division.

### Step width:

The difference between two consecutive readings of the scale.

### Excitation voltage:

The voltage that is supplied by the indicator to the load cell.

### Load cell:

Load cell is a device that converts force to electronic voltage. A load cell consists of two parts. The first part is a sensor that can be linearly distorted according to the force applied to it. The second part is the strain gauge element which changes its resistance according to the distortion of the sensor.

### Load cell rated output:

The output voltage from the load cell divided by the excitation voltage at load cell rated capacity. This is usually expressed in mV/V.

### Maximum capacity:

The maximum figure, ignoring decimal point, that the indicator will be calibrated to display.

### Resolution:

The ratio of the maximum capacity times multiplier to division. This is usually expressed in divisions or counts.

### Dead weight:

Dead weight is the self weight of the platform or scale load carrying structure on the load cells without the contents or items to be weighed. The output voltage of the load cell in response to the weight of the platform is usually the zero offset.

### Live weight:

The weight that is applied to the scale and shown on the indicator.

### Span:

The change of reading from the indicator in response to the change of standard weight applied. Full span is the change when full load or maximum capacity is applied.

### 1.3 FEATURES

- Suitable for all strain gauge load cells;
- Clear and stable 13mm, 6 digit LED display;
- Gross weight or net weight can be selected;
- Display step width is selectable in multiples of 1, 2 or 5;
- Numeric display of "O.L." when maximum capacity is exceeded;
- Display of decimal point is selectable up to 4 decimal places;
- Automatic zero tracking;
- Automatically set tare by push button;
- Delta-sigma conversion method;
- Internal resolution is 16,000,000 counts;
- Scale display resolution from 300 to 10,000;
- Conversion rate up to 200 times/sec;
- Function setting can be performed by software (RS232 option required);
- External on/off switch for function and calibration setting protection;
  - Options:
    - RS232 input and output port;
    - RS485 input and output port;
    - HI/LO comparator output (HH, Hi, Lo, LL);
    - Parallel BCD output;or 0~20/4~20 mA analogue output;
  - or 0~5 V analogue output;
    - Optional software:  
single material batching control software.

## 2. SPECIFICATIONS

### 2.1 GENERAL

- |                          |                               |
|--------------------------|-------------------------------|
| 1. Mains supply          | : 110VAC, 220VAC±10%, 50/60Hz |
| 2. Power consumption     | : 9 VA                        |
| 3. Operating temperature | : -5°C to 50°C(23°F to 122°F) |
| 4. Relative Humidity     | : 90%(non-condensing)         |
| 5. Weight                | : Approx 0.45 kg              |

### 2.2 DIGITAL SECTION

- |                             |   |
|-----------------------------|---|
| 1. Weight display           | : 6 digits LED display                      |
| 2. Display height           | : 13mm                                      |
| 3. Annunciators             | : Gross, Net, Zero, Motion and unit(kg/t)   |
| 4. Negative sign indication | : “-” on the left most digit                |
| 5. Over-range indication    | : Displays “O.L” or “-O.L”                  |
| 6. Maximum capacity         | : 500 to 100,000                            |
| 7. Step width               | : 1, 2, 5, 10, 20 or 50                     |
| 8. Decimal point            | : Displays to four different decimal places |

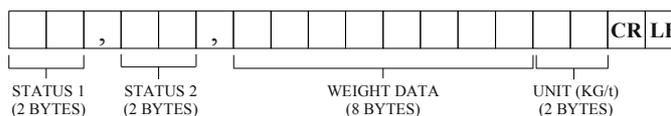
### 2.3 ANALOGUE SECTION

- |   |   |
|---|---|
| 1. Load cell type   | : All strain gauge load cells                     |
| 2. Load cell supply   | : 10VDC±5%, 150mA                                 |
| 3. Input sensitivity  | : 0.5µV/D to 200µV/D, max. 20mV input             |
| 4. Input resistance   | : More than 100MΩ at 500VDC between each terminal |
| 5. Zero point adjustment  | : 0.05mV to 15mV                                  |
| 6. Span stability   | : ±8ppm/ K of F.S                                 |
| 7. Zero stability   | : ±(0.4µV±0.006% initial zero offset voltage)/K   |
| 8. Non-linearity  | : Within 0.005% of F.S                            |
| 9. Conversion method  | : Delta-sigma                                     |
| 10. Conversion rate   | : Up to 200 times/sec                             |
| 11. Internal resolution   | : 16,000,000                                      |
| 12. Maximum display resolution  | : 10,000 divisions                                |
| 13. Comparison cycle  | : Approx 200 times/sec                            |
| 14. Dielectric strength   |   |
| -Between input terminal(common/earth/each opto-coupler output/analogue output/BCD output), for 1 min.                           | : 500VDC  |
| -Between power supply terminal and input terminal(common/earth/each opto-coupler output/analogue output/BCD output), for 1 min. | : 1500VAC   |

### 2.4 RS232/RS485 SERIAL OUTPUT (2 OPTIONS)

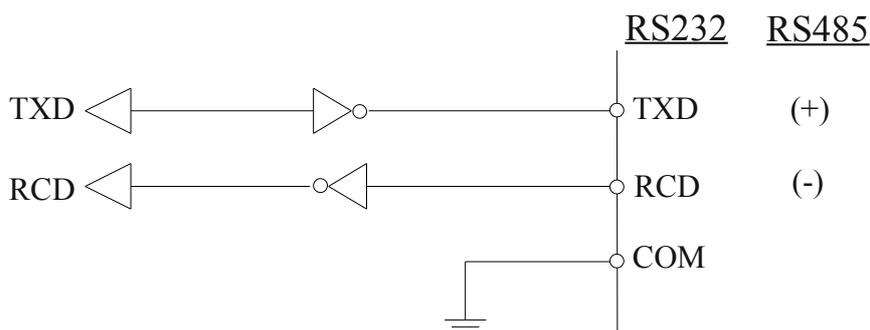
- |   |  |
|---|--|
| 1. Standard   | : EIA-RS232/RS485 output               |
| 2. Stream format  | : 7 Data bits, 1 stop bit, even parity |
| a) Baud rate  | : 2400, 4800, 9600, 19200              |
| b) Data type  | : ASCII code                           |
| c) Delimiter  | : CR/LF                                |
| 3. Communication mode   |  |
| a) Command mode:  |  |
| -After receiving the command word from the RS232/RS485 port, the indicator will             | carry                                  |
| out the appropriate action. Those commands valid only for RS232/RS485 port are.             |  |
| Command: READ<CR><LF>   | : request measured data                |
| TARE<CR><LF>  | : request TARE weight setting          |
| KEY<CR><LF>   | : key protection ON or OFF             |
| ZERO<CR><LF>  | : request ZERO value                   |
| Example: Read command (READ<CR><LF>) is “52H, 45H, 41H, 44H, 0DH, 0AH”                      |  |
| in ASCII code, numbers in hexadecimal.  |  |
| b) Continuous mode:   |  |
| -The data will be transmitted constantly without any input command to the RS232/RS485 port. |  |

4. Data format



- a) STATUS 1 : OL = overload, ST = stable, US = unstable
- b) STATUS 2 : NT = net weight, GS = gross weight
- c) WEIGHING DATA : A stream of eight bytes consisting of "0" to "9", negative sign "-", positive sign "+", space " " and decimal point.
- d) UNIT : kg = kilogram, t = ton

5. Schematic diagram of the serial port.



2.5 HI/LO COMPARATOR/SETPOINT OUTPUT (OPTIONAL)

- 1. HI/LO output : HH, HI, LO or LL
- 2. Max. capacity : 80VDC, 300mA

2.6 BCD OUTPUT (OPTIONAL)

- 1. BCD output : Parallel BCD output
- 2. BCD output level : **5V TTL** or open collector

2.7 ANALOGUE OUTPUT (2 OPTIONS)

- 1. Analogue output, voltage option : 0~5V
- 2. Analogue output, current option : 0~20mA/4~20mA

The excitation current specification will be reduced to 120mA if the 0~20mA/4~20mA output board is used.

NOTE: An analogue option and the BCD option cannot be used together.

2.8 INPUT (BUILT-IN)

- Input : IN1, IN2 or IN3
- Input mode : Passive switch
- Input contact time : 30 ms

2.9 Single Material Batching Option

This option requires a Hi/Lo setpoint option to be fitted.  
 This option requires factory configuration and must be ordered at the time of purchase of the PT200MI and Hi/Lo option.

Settings for Final, Zero Band, Optional Preliminary, Preliminary, Free Fall.  
 Outputs for Zero Band, Optional Preliminary, Preliminary, Free Fall.  
 See 2.5 above for electrical characteristics.  
 See 10.7 for more details.

## 3. OPERATION

### 3.1 GENERAL RULES

Do not install the PT200MI in direct sunshine, and avoid sudden temperature changes, vibration or wind.

The best environment is when the temperature is about 20°C or 68°F and the relative humidity is about 50%.

Ground the PT200MI via the power cable to the rear terminal and ensure a good ground connection. Do not ground directly to other equipment.

Analogue input/output signals are sensitive to electrical noise. Do not bind these cables together as it could result in cross-talk interference. Please also keep them well away from AC power cables, and keep all cables as short as possible.

If the local AC electrical supply fluctuates by more than ±10% an AC regulator must be used in order to stabilize the power and reduce power spikes.

### 3.2 INPUT SENSITIVITY OF LOAD CELLS

The input sensitivity (A) of the load cells can be calculated from the following formula:

$$A = (\text{Live weight of the scale}) / (\text{Number of load cells}) / (\text{Load cell capacity}) * (\text{Load cell mV/V at capacity}) * (\text{Excitation voltage}) * (1000 \text{ for microvolts}) / (\text{Scale resolution in divisions})$$

Alternatively

$$A = (\text{Load cell output voltage at scale capacity} - \text{load cell output voltage at dead load}) \times \text{Step width} / \text{Scale capacity}$$

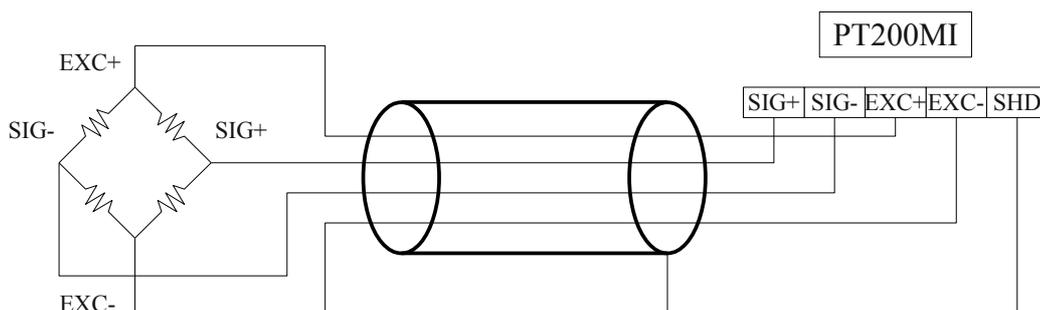
PT200MI requires that "A" must be greater than or equal to 0.5µV/D.

### 3.3 CONNECTING THE LOAD CELL TO THE INDICATOR

The analogue output from the Load cell and the RS232/RS485 input/output signals are sensitive to electrical noise. Do not bind these cables together as it could result in cross-talk interference. Please also keep them well away from the AC power cables.

When the load cell has a 6 wire cable, connect Sense+ to Excitation+ and Sense - to Excitation -.

Load cell connections	
Pin no.	Signal
EXC+	Excitation+ (Sense+)
EXC-	Excitation - (Sense -)
SIG+	Signal +
SIG-	Signal -
SHD	Shield



## 4. INDICATOR AND KEYS

### 4.1 INDICATOR



- Indicator On/Off : Press the MODE key for 3 seconds.  
 Function mode : Enter by pressing MODE and G/N keys for 2 seconds, "FUNC" is displayed.  
 Calibration mode : Enter by pressing MODE and TARE keys for 2 seconds, "CAL" is displayed.  
 kg/lb conversion : Press G/N key for 2 seconds, the "kg" annunciator flashes. The unit is in 1b mode while the "kg" annunciator is flashing. Pressing G/N key for 2 seconds will return the unit to kg. (Note: 1kg = 2.2046 lb)  
 HI/LO set-point mode : Enter by pressing MODE and ZERO keys for 2 seconds, "SET" is displayed.

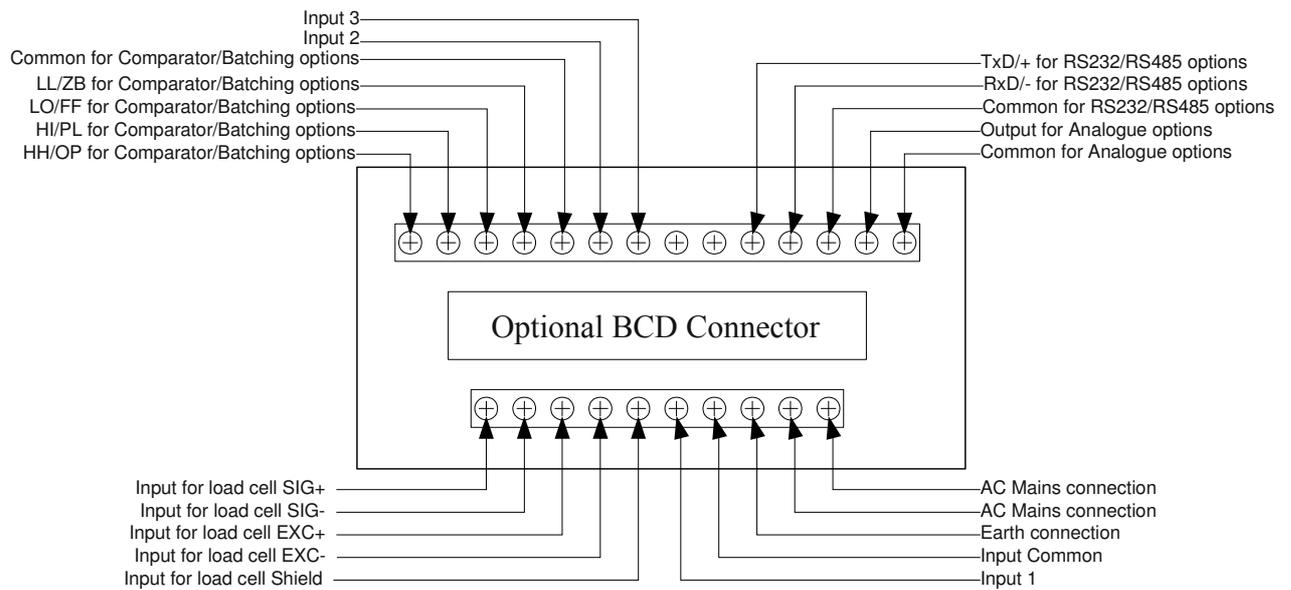
Note: For entering setting modes, press and hold the MODE key first then immediately pressing G/N, TARE or ZERO as appropriate.

### 4.2 FRONT PANEL DESCRIPTION

1. MODE key: Enters data or skips span setting during calibration.
2. G/N key: Selects set data items or changes the gross/net value displayed or skip zero setting during calibration.
3. TARE key: Selects the digit during data setting or tares the reading and changes the display mode to net mode.
4. ZERO key: Selects the digit during data setting or if the zero offset is within 1% to 10% of maximum capacity, press this key to zero the reading.
5. GROSS annunciator: Indicates gross weight is displayed
6. NET annunciator: Indicates net weight is displayed
7. MOTION annunciator: Indicates motion detection
8. ZERO annunciator: Indicates gross value is within zero band
9. kg annunciator: Indicates unit is "kg" or "lb" if flashing
10. t annunciator: Indicates unit is "ton"

Note: The decimal point in the setting digit will blink during data setting to indicate which digit is being altered. Data entered can not be a negative value.

## 4.3 REAR PANEL DESCRIPTION



1. Mains power input terminal: AC (PH), AC (N), EARTH
2. Load cell input terminal: SIG+, SIG-, EXC+, EXC-, SHIELD
3. Input terminal: IN1, IN2, IN3, COM (Input 1, Input 2, Input 3, Input Common)
4. Hi/Lo comparison output terminal: HH, HI, LO, LL, COMMON (with option)  
Single material batch output terminal: OP, PL, FF, ZB, COMMON (with options)
5. Serial communication terminal: TxD, RxD, COMMON (with options)
6. Analogue signal output terminal: OUTPUT, COMMON (with options)

# 5. FUNCTION SETTING

Enter function setting: Press and hold MODE key, then press G/N key, 2 seconds later, "FUNC" is displayed, the function setting mode is selected and data within functions "F0 0" to "F19 XX" can be set.

- Note INPUT1 must be connected to COM to enter the function setting mode.**
- The factory setting for INPUT1 is FUNC and implements this lock.**
- Not all changes to functions activate immediately. F0 saves any changes.**
- After saving with F0, turn off, wait 30 seconds and turn on to activate all changes.**

If function data is changed, enter the calibration mode to verify/perform calibration as calibration may have altered.

Key description:

- |      |
|------|
| ZERO |
|------|

 key : Selects the function No. (from F0 to F19 to F0).
- |      |
|------|
| TARE |
|------|

 key : Changes the data value(from FX 0 to 1,2.....etc.).
- |      |
|------|
| ZERO |
|------|

 key : Accepts the data and moves to the next function.

Note:

- (1) Data setting using RS232/RS485 is possible with a serial option installed and using a simple terminal program such as hyperterminal or seyon.
- (2) If an error occurs, "ERROR X" will be output from the RS232/RS485 port.
- (3) When a "check sum" error occurs or there is a function change of "max.cap", "mult" or "step", the PT200MI is put into the "CAL" re-set mode (the message is automatically displayed). However the power supply must be turned off/on during that state, the PT200MI will return to the weighing mode and "CAL" mode must be entered manually.
- (4) Percentage of zero range can be ignored.

Function setting must be within the parameters of the instrument.

- The total divisions (capacity divided by the increment or step) cannot exceed 10000.
- The minimum number of divisions is 100.
- The voltage input per division (increment, step) must not be less than the minimum input sensitivity of 0.5µV/D.

MULTIPLIER DIVISION	F4 F5	0.0001 (F4=5)			0.001 (F4=4)			0.01 (F4=3)		
		1	2	5	1	2	5	1	2	5
		(F5=0)	(F5=1)	(F5=2)	(F5=0)	(F5=1)	(F5=2)	(F5=0)	(F5=1)	(F5=2)
Increment	or step	0.0001	0.0002	0.0005	0.001	0.002	0.005	0.01	0.02	0.05
<b>500</b>	(F6=0)	0.0500	0.0500	0.0500	0.500	0.500	0.500	5.00	5.00	5.00
<b>1000</b>	(F6=1)	0.1000	0.1000	0.1000	1.000	1.000	1.000	10.00	10.00	10.00
<b>1200</b>	(F6=2)	0.1200	0.1200	0.1200	1.200	1.200	1.200	12.00	12.00	12.00
<b>1500</b>	(F6=3)	0.1500	0.1500	0.1500	1.500	1.500	1.500	15.00	15.00	15.00
<b>2000</b>	(F6=4)	0.2000	0.2000	0.2000	2.000	2.000	2.000	20.00	20.00	20.00
<b>2500</b>	(F6=5)	0.2500	0.2500	0.2500	2.500	2.500	2.500	25.00	25.00	25.00
<b>3000</b>	(F6=6)	0.3000	0.3000	0.3000	3.000	3.000	3.000	30.00	30.00	30.00
<b>4000</b>	(F6=7)	0.4000	0.4000	0.4000	4.000	4.000	4.000	40.00	40.00	40.00
<b>5000</b>	(F6=8)	0.5000	0.5000	0.5000	5.000	5.000	5.000	50.00	50.00	50.00
<b>6000</b>	(F6=9)	0.6000	0.6000	0.6000	6.000	6.000	6.000	60.00	60.00	60.00
<b>8000</b>	(F6=10)	0.8000	0.8000	0.8000	8.000	8.000	8.000	80.00	80.00	80.00
<b>10000</b>	(F6=11)	1.0000	1.0000	1.0000	10.000	10.000	10.000	100.00	100.00	100.00
<b>12000</b>	(F6=12)	ERR	1.2000	1.2000	ERR	12.000	12.000	ERR	120.00	120.00
<b>15000</b>	(F6=13)	ERR	1.5000	1.5000	ERR	15.000	15.000	ERR	150.00	150.00
<b>20000</b>	(F6=14)	ERR	2.0000	2.0000	ERR	20.000	20.000	ERR	200.00	200.00
<b>25000</b>	(F6=15)	ERR	ERR	2.5000	ERR	ERR	25.000	ERR	ERR	250.00
<b>30000</b>	(F6=16)	ERR	ERR	3.0000	ERR	ERR	30.000	ERR	ERR	300.00
<b>40000</b>	(F6=17)	ERR	ERR	4.0000	ERR	ERR	40.000	ERR	ERR	400.00
<b>50000</b>	(F6=18)	ERR	ERR	5.0000	ERR	ERR	50.000	ERR	ERR	500.00
<b>60000</b>	(F6=19)	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
<b>80000</b>	(F6=20)	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR

To aid setting of the PT200MI a tables below show settings of F4, F5 and F6 for various capacities and increments.

MULTIPLIER F4 DIVISION F5		0.1 (F4=2)			1 (F4=1)			10 (F4=0)		
		1	2	5	1	2	5	1	2	5
		(F5=0)	(F5=1)	(F5=2)	(F5=0)	(F5=1)	(F5=2)	(F5=0)	(F5=1)	(F5=2)
Increment	or step	0.1	0.2	0.5	1	2	5	10	20	50
<b>500</b>	(F6=0)	50.0	50.0	50.0	500	500	500	ERR	ERR	ERR
<b>1000</b>	(F6=1)	100.0	100.0	100.0	1000	1000	1000	1000	ERR	ERR
<b>1200</b>	(F6=2)	120.0	120.0	120.0	1200	1200	1200	1200	ERR	ERR
<b>1500</b>	(F6=3)	150.0	150.0	150.0	1500	1500	1500	1500	ERR	ERR
<b>2000</b>	(F6=4)	200.0	200.0	200.0	2000	2000	2000	2000	2000	ERR
<b>2500</b>	(F6=5)	250.0	250.0	250.0	2500	2500	2500	2500	2500	ERR
<b>3000</b>	(F6=6)	300.0	300.0	300.0	3000	3000	3000	3000	3000	ERR
<b>4000</b>	(F6=7)	400.0	400.0	400.0	4000	4000	4000	4000	4000	ERR
<b>5000</b>	(F6=8)	500.0	500.0	500.0	5000	5000	5000	5000	5000	5000
<b>6000</b>	(F6=9)	600.0	600.0	600.0	6000	6000	6000	6000	6000	6000
<b>8000</b>	(F6=10)	800.0	800.0	800.0	8000	8000	8000	8000	8000	8000
<b>10000</b>	(F6=11)	1000.0	1000.0	1000.0	10000	10000	10000	10000	10000	10000
<b>12000</b>	(F6=12)	ERR	1200.0	1200.0	ERR	12000	12000	12000	12000	12000
<b>15000</b>	(F6=13)	ERR	1500.0	1500.0	ERR	15000	15000	15000	15000	15000
<b>20000</b>	(F6=14)	ERR	2000.0	2000.0	ERR	20000	20000	20000	20000	20000
<b>25000</b>	(F6=15)	ERR	ERR	2500.0	ERR	ERR	25000	25000	25000	25000
<b>30000</b>	(F6=16)	ERR	ERR	3000.0	ERR	ERR	30000	30000	30000	30000
<b>40000</b>	(F6=17)	ERR	ERR	4000.0	ERR	ERR	40000	40000	40000	40000
<b>50000</b>	(F6=18)	ERR	ERR	5000.0	ERR	ERR	50000	50000	50000	50000
<b>60000</b>	(F6=19)	ERR	ERR	ERR	ERR	ERR	60000	60000	60000	60000
<b>80000</b>	(F6=20)	ERR	ERR	ERR	ERR	ERR	80000	80000	80000	80000
<b>100000</b>	(F6=21)	ERR	ERR	ERR	ERR	ERR	100000	100000	100000	100000

MAXIMUM  
CAPACITY  
F6

## 5.1 DATA SETTING

Entering the data setting mode:

- Press and hold the MODE key, then press the G/N key, 2 seconds later, "FUNC" displays.
- A further 2 seconds later "F0 0" is displayed.
- Press ZERO to move to the next setting.
- To exit the setting mode press ZERO until "F0 0" is displayed and then press MODE to save the function settings.

Setting data:

Data selection is performed with the MODE key.

- Continue pressing MODE until the number indicating the desired selection appears.
- The ZERO key accepts the setting and moves on to the next function.
- If no change is required press the ZERO key to move to the next function.
- To save the data press ZERO until "F0 0" is reached and then press MODE.

### 5.1.1 "F0 0" EXIT THE FUNCTION SETTING MODE

Press MODE key to accept and save the data for all the functions altered, and enter the weighing mode.

Press ZERO key to skip to the next setting.

### 5.1.2 "F1 0" ZERO TRACK TIME

Press TARE key to select, ZERO to accept.

0 = No track      1 = 1 sec

### 5.1.3 "F2 0" ZERO TRACK BAND

Press TARE key to select, ZERO to accept.

0 = 1 step width      1 = 2 step width      2 = 4 step width

## 5.1.4 "F3 0" MOTION DETECTION

Press TARE key to select, ZERO to accept.

0 = 1 step width/sec      1 = 3 step width/sec      2 = 5 step width/sec      3 = 10 step width/sec

## "F4 0" MULTIPLIER OR DECIMAL POINT

Press TARE key to select, ZERO to accept.

0 = 10      1 = 1      2 = 0.1      3 = 0.01      4 = 0.001      5 = 0.0001

## 5.1.6 "F5 0" DIVISION

Press TARE key to select, ZERO to accept.

0 = 1      1 = 2      2 = 5

## 5.1.7 "F6 0" MAXIMUM CAPACITY

Press TARE key to select, ZERO to accept.

0 = 500	1 = 1000	2 = 1200	3 = 1500	4 = 2000	5 = 2500
6 = 3000	7 = 4000	8 = 5000	9 = 6000	10 = 8000	11 = 10000
12 = 12000	13 = 15000	14 = 20000	15 = 25000	16 = 30000	17 = 40000
18 = 50000	19 = 60000	20 = 80000	21 = 100000		

If the maximum capacity does not satisfy the following condition, it will show "ERROR 1" for 2 seconds then return to the F4 (decimal point) setting mode.

Maximum capacity  $\geq$  500  
Maximum capacity  $\leq$  100,000

Note: "ERROR 1" is also output to RS232/RS485 if the option is fitted.

## 5.1.8 "F7 0" BAUD RATE

Press TARE key to select, ZERO to accept.

0 = 2400 baud      1 = 4800 baud      2 = 9600 baud      3 = 19200 baud

## 5.1.9 "F8 0" RS232/RS485 OUTPUT MODE

Press TARE key to select, ZERO to accept.

0 = Continuous mode (weight continuously output)  
1 = Command mode (weight output in response to READ instruction over RS232/RS485)

## 5.1.10 "F9 0" UNIT

Press TARE key to select, ZERO to accept.

0 = kg      1 = ton

## 5.1.11 "F10 0" ZERO RETURN RANGE

Press TARE key to select, ZERO to accept.

0 = 1%      1 = 2%      2 = 3%      3 = 4%      4 = 5%      5 = 6%      6 = 7%      7 = 8%      8 = 9%      9 = 10%

Note: In the normal weighing mode, the PT200MI can be zeroed with a reading within the range 1% to 10% of maximum capacity by pressing ZERO key.

## 5.1.12 "F11 0" DIGITAL FILTER

Press TARE key to select, ZERO to accept.

0 = 0      1 = 2      2 = 4      3 = 8      4 = 16      5 = 32      6 = 64      7 = 128      8 = 256      9 = 512

## 5.1.13 "F12 0" DISPLAY UPDATE RATE

Press TARE key to select, ZERO to accept.

0 = 1 time/sec      1 = 4 times/sec      2 = 8 times/sec      3 = 16 times/sec      4 = 20 times/sec

## 5.1.14 "F13 0" BCD OUTPUT RATE

Press TARE key to select, ZERO to accept.

0 = 4 times/sec      1 = 8 times/sec      2 = 16 times/sec      3 = 20 times/sec  
4 = 60 times/sec      5 = 80 times/sec      6 = 100 times/sec      7 = 200 times/sec

Note: There is no need to set this without the BCD board option.

## 5.1.15 "F14 0" RS485 ID CODE

Press TARE key to select, ZERO to accept.

00 ~ 99

Note: This parameter will be activated only for the RS485 option.

The ID code must not be the same as any other PT200MI which connected to the same master device.

ID = 00, only single device communication.

## 5.1.16 "F15 0" PEAK HOLD

Press TARE key to select, ZERO to accept.

0 = Peak hold is not valid      1 = Peak hold(automatically)      2 = Valley hold(automatically)  
3 = Peak – valley hold(automatically)      4 = Peak hold(external)      5 = Valley hold(external)  
6 = Peak – valley hold(external)

Note: 4, 5 or 6 must coincide with a setting of "8 = Peak hold" for F16, F17 or F18.

## 5.1.17 "F16 0" INPUT 1

Press TARE key to select, ZERO to accept.

0 = Function      1 = Zero      2 = Tare      3 = Gross/Net      4 = Print      5 = kg/lb  
6 = On/Off      7 = Hold      8 = Peak hold

## 5.1.18 "F17 0" INPUT 2

Press TARE key to select, ZERO to accept.

0 = Function      1 = Zero      2 = Tare      3 = Gross/Net      4 = Print      5 = kg/lb  
6 = On/Off      7 = Hold      8 = Peak hold

## 5.1.19 "F18 0" INPUT 3

Press TARE key to select, ZERO to accept.

0 = Function      1 = Zero      2 = Tare      3 = Gross/Net      4 = Print      5 = kg/lb  
6 = On/Off      7 = Hold      8 = Peak hold

## 5.1.20 "F19 0" COMPARISON CONDITION

Press TARE key to select, ZERO to accept.

0 = Gross weight      1 = Net weight      2 = Display weight

Note: The comparison condition is the weight that will be compared against the set-points.

## 5.2 FUNCTION SETTING USING RS232/RS485 (only if RS232 or RS485 option is installed)

Function setting can be conveniently performed by using RS232/RS485 during normal weighing mode.

Refer to the section on RS232/RS485 for connection diagrams.

From the RS232 port, input a command "FUNC<CR><LF>", the display will show "FUNC" throughout the function setting mode.

From the RS485 port, input a command "<ENQ>IDXX<CR><LF>", indicator responds "<ACK>XX<CR><LF>", then input a command "FUNC<CR><LF>", the gross display will show "FUNC". XX is the indicator ID set in F14 above.

The sequence of function setting via serial port involves sending a series of parameters followed by <CR><LF> and receiving a subsequent response from the PT200MI. If an invalid parameter is sent the PT200MI responds NO? <CR><LF> and a correct entry must be made or N<CR><LF> sent to move to the next setting. When the correct parameter has been sent sending N<CR><LF> moves to the next function. Sending R<CR><LF> returns to normal weighing mode. **Note that commands are case sensitive.**

**Note that the factory setting for INPUT1 is FUNC and INPUT1 must be connected to COM to enter the function setting mode.**

### 5.2.0 ENTER SERIAL FUNCTION SETTING MODE

The PT200MI displays "FUNC" throughout the serial setting mode.

<i>Transmit</i>	<i>Response</i>
(RS485)<ENQ>IDXX<CR><LF> (RS232/RS485)FUNC<CR><LF>	(RS485)<ACK>XX<CR><LF> (RS232/RS485) Z.TRACK T=[num]<CR><LF>
PT200 displays "FUNC"	

### 5.2.1 ZERO TRACK TIME

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	Z.TRACK T=[num]<CR><LF>
<i>Options for [num]</i> 0 = No track    1 = 1 sec	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	Z.TRACK D=[num]<CF><LF> YES

### 5.2.2 ZERO TRACK BAND

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	Z.TRACK D=[num]<CR><LF>
<i>Options for [num]</i> 0 = 1 step width    1 = 2 step width 2 = 4 step width	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	MOTION [num]D/S<CF><LF> YES

### 5.2.3 MOTION DETECTION

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	MOTION [num]D/S<CR><LF>
<i>Options for [num]</i> 1 = 1 step width    3 = 3 step width    5 = 5 step width    10 = 10 step width	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	D.P [num]<CF><LF> YES

## 5.2.4 DECIMAL POINT

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	D.P [num]<CR><LF>
<i>Options for [num]</i> 0 = No DP    1 = XXXX.X    2 = XXX.XX    3 = XX.XXX    3 = X.XXXX	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	MULT [num]<CF><LF> YES

## 5.2.5 MULTIPLIER (It is only possible to modify the multiplier when no decimal point is set)

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	MULT [num]<CR><LF>
<i>Options for [num]</i> 1 = 1                      10 = 10	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	d [num]<CF><LF> YES

## 5.2.6 DIVISION

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	d [num]<CR><LF>
<i>Options for [num]</i> 1 = 1                      2 = 2                      5 = 5	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	MAX.CAP [num]<CF><LF> YES

## 5.2.7 MAXIMUM CAPACITY

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	MAX.CAP [num]<CR><LF>
<i>Options for [num]</i> 500      1000      1200      1500      2000      2500      3000      4000 5000      6000      8000      10000      12000      15000      20000      25000 30000      40000      50000      60000      80000      100000	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	BAUD [num]<CF><LF> YES

Note that this is the maximum displayed reading without the decimal point showing.  
If there is any error in the maximum capacity, step width and multiplier, the error message "ERROR 1" will be sent out, PT200MI will return to 5.2.4.

## 5.2.8 RS232/RS485 BAUD RATE

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	BAUD [num]<CR><LF>
<i>Options for [num]</i> 2400      4800      9600      19200	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	UNIT [string]<CF><LF> YES

## 5.2.9 UNIT

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	UNIT [string]<CR><LF>
<i>Options for [string]</i> <SP>t = ton kg = kg (Note <SP> is a single space required before the t)	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	Z.RANGE [num]<CF><LF> YES

## 5.2.10 ZERO RETURN RANGE

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	Z.RANGE [num]<CR><LF>
<i>Options for [num]</i> 1      2      3      4      5      6      7      8      9      10 (NOTE these numbers are actual % of range)	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	D.FILTER [NUM]<CF><LF> YES

## 5.2.11 DIGITAL FILTER

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	D.FILTER [num]<CR><LF>
<i>Options for [num]</i> 0      2      4      8      16      32      64      128      256      512	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	DSP RATE [NUM]<CF><LF> YES

## 5.2.12 DISPLAY UPDATE RATE

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	DSP RATE [num]<CR><LF>
<i>Options for [num]</i> 1 = 1 times/sec    4 = 4 times/sec    8 = 8 times/sec    16 = 16 times/sec	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	BCD RATE [NUM]<CF><LF> YES

## 5.2.13 BCD OUTPUT RATE

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	BCD RATE [num]<CR><LF>
<i>Options for [num]</i> 4 = 4 times/sec      8 = 8 times/sec      16 = 16 times/sec      20 = 20 times/sec 60 = 60 times/sec    80 = 80 times/sec    100 = 100 times/sec    200 = 200 times/sec	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	ID. NO. [num]<CF><LF> YES

## 5.2.14 ID CODE (only applicable if RS485 option is fitted)

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	ID. NO. [num]<CR><LF>
<i>Options for [num]</i> 2 digit number 00 to 99	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	PEAK HOLD OFF<CF><LF> YES

## 5.2.15 PEAK HOLD

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	[string]<CR><LF>
<i>Options for [string]</i>	
OFF	PEAK AUTO VALLEY AUTO PEAK VALLEY AUTO
	PEAK EXT VALLEY EXT PEAK VALLEY EXT
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	INPUT1 [string]<CF><LF> YES

## 5.2.16 INPUT 1

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	INPUT1 [string]<CR><LF>
<i>Options for [string]</i>	
FUNC	ZERO TARE G/N PRINT
kg/lb	ON/OFF HOLD PEAK HOLD
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	INPUT2 [string]<CF><LF> YES

## 5.2.17 INPUT 2

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	INPUT2 [string]<CR><LF>
<i>Options for [string]</i>	
FUNC	ZERO TARE G/N PRINT
kg/lb	ON/OFF HOLD PEAK HOLD
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	INPUT3 [string]<CF><LF> YES

## 5.2.18 INPUT 3

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	INPUT3 [string]<CR><LF>
<i>Options for [string]</i>	
FUNC	ZERO TARE G/N PRINT
kg/lb	ON/OFF HOLD PEAK HOLD
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	COMPARISON [string]<CF><LF> YES

## 5.2.19 COMPARISON CONDITION

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	INPUT3 [string]<CR><LF>
<i>Options for [string]</i>	
GROSS	NET      DISPLAY
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	Z.TRACK T=[num]<CF><LF> YES

Note: When maximum capacity, division or multiplier is changed, the system must be calibrated again and it is also necessary to reset the Hi/Lo set point, the display of PT200MI will show "CAL1".

## 6. CALIBRATION

Note: Zero tracking can not be performed during calibration.

The weighing data can be accepted only when motion is not detected during calibration, the motion annunciator must be unlit.

When an error occurs, the error message will output from the RS232/RS485 port if fitted.

**Note that INPUT1 must be connected to COM to enter the calibration setting mode unless this setting is altered in the function setting section. The factory setting for INPUT1 is FUNC.**

### 6.1 NOTES DURING SPAN SETTING

- Span setting when step width and multiplier are not set to 1.  
When entering the value of the known calibration load it is necessary to enter this value with the same increments as set for the PT200MI display of weight. For accurate calibration the known weight should then be able to be divided by the indicator step without any remainder. This includes steps of 10, 20 and 50.
- When the multiplier is set to  $\times 10$ , no right most digit can be set.
- When the multiplier, maximum capacity or step width is changed or check sum error occurs, the CAL mode can not be exited by pressing the MODE key (calibration data must be reset).
- The PT200MI will not accept a calibration setting with the motion annunciator lit as the weight value is uncertain. If calibration is required in unstable conditions the motion detection function settings (F3) and filtering (F11) should be made larger until the motion annunciator is no longer lit. These function settings can be changed back to another preferred value after calibration without having to re-calibrate.
- After span calibration it may be necessary to turn the PT200MI off and then back on again for the indicator to return to weighing mode.

### 6.2 SETTING STEPS

#### 6.2.1 CALIBRATION 1 (by using a known weight)

Entering the calibration mode:

- Press and hold the MODE key, then press the TARE key, 2 seconds later, "CAL 1" displays.
- Press the ZERO key, the ZERO annunciator flashes and the zero calibration stage has been entered.

#### 1. ZERO CALIBRATION

If the current zero setting is acceptable it is not necessary to re-calibrate the zero offset, press the G/N key to skip the zero calibration procedure, and enter the span calibration stage. Nothing will show on the display, the G/N or MODE key should be pressed to continue.

If a new zero offset is to be calibrated press the MODE key to accept the current load as the new 0.

#### 2. SPAN CALIBRATION

Once zero calibration is complete the span calibration stage is reached and the GROSS annunciator flashes throughout the span calibration stage.

After performing zero calibration without error, the indicator will display " . " or "00000.0". The GROSS annunciator will be flashing.

Press the MODE key to return to the normal weighing condition if only zero adjustment is required.

If a new span calibration is to be set put the known calibration weight on to the weighing platform, use the ZERO key to move the decimal point to the digit to be set and the TARE key to set the digit so that the reading of the indicator is the same as the value of the standard weight, press the MODE key to perform the calibration.

Take care to note the position of the decimal point and the division prior to entering calibration mode as the value entered during span calibration should be in the same format as that set for display during function setup. i.e. if the scale has been set to show "100.00" at maximum capacity and the division is 5 then a known calibration load of 76.05 would be entered as 7605. The decimal point does not show as it is used to indicate the digit being set.

Note: The minimum calibration load required is 100 times the step width.

### 6.2.2 CALIBRATION 2 (accuracy ~1% by mV/V data input)

Entering the calibration mode:

Press and hold the MODE key, then press the TARE key, 2 seconds later, "CAL 1" displays. Press the TARE key again and "CAL 2" is displayed. Press the ZERO key, the ZERO annunciator flashes and the zero calibration stage has been entered. Nothing will show on the display, the G/N or MODE key should be pressed to continue.

#### 1. ZERO CALIBRATION

If the current zero setting is acceptable it is not necessary to calibrate the zero offset, press the G/N key to skip the zero calibration procedure, and enter the span calibration stage.

If a new zero offset is to be calibrated press the MODE key to accept the current load as the new 0.

#### 2. SPAN CALIBRATION

Once zero calibration is complete the span calibration stage is reached and the GROSS annunciator flashes throughout the mV/V entry stage. The indicator will display a value in the format "1.0000", input the value by selecting the digit to change with the ZERO key and changing the value with the TARE key. Units are mV/V with 4 decimal places. The "GROSS" annunciator will flash throughout this stage. Press the G/N key to move to the next stage or the MODE key to accept the entered data and return to normal weighing. The mV/V value to enter is the amount the signal will change for the next entered load value. The load value cannot be larger than the scale capacity set in the function settings.

When G/N is pressed the Gross annunciator is steadily lit. The value shown should be changed by selecting the digit to change with the ZERO key and changing the value with the TARE key. The value is the load that would be required to produce the mV/V change previously entered. This value is entered as digits without decimal point and must be a multiple of the indicator step. If the PT200MI capacity is set to a capacity 100.00 and the previously entered mV/V was for a load of 50.00 then enter 5000 at this stage. Press the MODE key to complete and return to normal weighing.

Example: 4 load cells 30 t capacity and nominally 2 mV/V are connected in a scale. Set for 100.00 t capacity. Obtaining the exact calibration value from the certificates and averaging these yields a value of 1.9998 mV/V. The scale capacity is 120 t. 120 t is greater than the maximum capacity (100 t) set in the PT200MI so divide the values in half.

Enter 0.9999 for the value of mV/V and press G/N then enter 6000 then press MODE.

### 6.3 ERROR CODES DURING CALIBRATION

ERROR 1 : Incorrect setting for multiplier, division, or maximum capacity.

ERROR 2 : Incorrect wiring between load cell and indicator, voltage for zero value is greater than the voltage for span value.

ERROR 3 : Input voltage too low. The dead weight of the weighing platform may be too light. Add a 1% metal film resistor of 50KΩ to 500KΩ between EX+ and SG+.

ERROR 4 : Input voltage too high. The dead weight of the weighing platform may be too heavy. Add a 1% metal film resistor of 50KΩ to 500KΩ between EX + and SG-.

ERROR 5 : Input sensitivity of the load cell is out of range.

ERROR 6 : Load cell output voltage at scale capacity is too high.

ERROR 7 : Zero offset is greater than zero return range.

### 6.4 CALIBRATION USING RS232/RS485 (only if RS232 or RS485 option is installed)

Calibration setting can be conveniently performed by using RS232/RS485 during normal weighing mode. Refer to the section on RS232/RS485 for connection diagrams.

From the RS232 port, input a command "CAL<CR><LF>", "CAL 1<CR><LF>" or "CAL2<CR><LF>", the display will show "CAL 1" or "CAL 2" throughout the calibration setting mode.

From the RS485 port, input a command "<ENQ>IDXX<CR><LF>", indicator responds "<ACK>XX<CR><LF>", then input a command "CAL<CR><LF>", "CAL 1<CR><LF>" or "CAL2<CR><LF>", the display will show "CAL 1" or "CAL 2". XX is the indicator ID set in function F14 above.

The sequence of calibration setting via serial port involves sending a series of parameters followed by <CR><LF> and receiving a subsequent response from the PT200MI. If an invalid parameter is sent the PT200MI responds NO? <CR><LF> and a correct entry must be made. When the correct parameter has been sent the PT200MI moves to the next stage.

**Note that commands are case sensitive.**

Note that INPUT1 must be connected to COM to enter the calibration setting mode **unless this setting is altered in the function setting section. The factory setting for INPUT1 is FUNC.**

## 6.4.1 ENTER SERIAL CALIBRATION SETTING MODE 1 (by using a known weight)

The PT200MI displays "CAL 1" throughout the serial setting mode.

<b>Transmit</b>	<b>Response</b>
(RS485)<ENQ>IDXX<CR><LF> (RS232/RS485)CAL 1<CR><LF> or CAL<CR><LF>	(RS485)<ACK>XX<CR><LF> (RS232/RS485) CAL ZERO<CR><LF>
PT200 displays "CAL 1"	

## 1. ZERO CALIBRATION

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	YES<CR><LF>CAL SPAN<CR><LF> or Error [n]<CR><LF>
<i>Options for [string]</i> N = Perform a zero offset calibration R = Return to normal weighing condition without any adjustment. J = SKIP ZERO OFFSET CALIBRATION.	

Note: If maximum capacity, division or multiplier was changed and no calibration is performed after the modification, then the R command is invalid and N or J must be entered.

Input N to perform zero offset calibration only when there is no motion detected (motion annunciator is not lit) and no load is on the weighing platform.

ERROR [n] : See the errors listing in section 6.3 above.

## 2. SPAN CALIBRATION

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	CAL SPAN [num]<CR><LF>YES<CR><LF> or Error [n]<CR><LF>
<i>Options for [num]</i> The value of the calibration load.	
R<CR><LF> to return to normal weighing.	YES

Note: If maximum capacity, division or multiplier was changed and no calibration is performed after the modification, the "R" command is invalid.

Note: The calibration load is entered as a number without decimal point and must be a multiple of the indicator step size. i.e if the indicator maximum capacity is 100.00 and the step is 0.05 and the calibration load is 75.15 enter 7515 for num above.

ERROR [n] : See the errors listing in section 6.3 above.

## 6.4.2 ENTER SERIAL CALIBRATION SETTING MODE 2 (accuracy ~1% by using mV/V entry)

The PT200MI displays "CAL 2" throughout the serial setting mode.

<b>Transmit</b>	<b>Response</b>
(RS485)<ENQ>IDXX<CR><LF> (RS232/RS485)CAL2<CR><LF>	(RS485)<ACK>XX<CR><LF> (RS232/RS485) CAL ZERO<CR><LF>
PT200 displays "CAL 2"	

## 1. ZERO CALIBRATION

<b>Transmit</b>	<b>Response</b>
[string]<CR><LF>	YES<CR><LF>SPIN 1.5000mV/V<CR><LF> or Error [n]<CR><LF>
<i>Options for [string]</i> N = Perform a zero offset calibration	
J<CR><LF> to move to the next stage. R<CR><LF> to return to normal weighing.	YES<CR><LF>SPIN 1.5000mV/V<CR><LF> YES<CR><LF>

Note: If maximum capacity, division or multiplier was changed and no calibration has been performed after the change, then the R command is invalid and N or J must be entered. Input N to perform zero offset calibration only when there is no motion detected (motion annunciator is not lit) and no load is on the weighing platform.

ERROR [n] : See the errors listing in section 6.3 above.

## 2. Span voltage setting

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	SPIN [num]<CR><LF>YES<CR><LF> Error [n]<CR><LF>
<i>Options for [num]</i> The value of the signal for the applied calibration load.	
N<CR><LF> to move to the next stage. R<CR><LF> to return to normal weighing.	SPAN 7515<CR><LF> YES

Note: Input the value as 5 digits without a decimal point. Units are 0.1 micro V/V or mV/V with 4 decimal places with the decimal point removed.

## 3. SPAN CALIBRATION

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	SPAN [num]<CR><LF> Error [n]<CR><LF>
<i>Options for [num]</i> The value of the calibration load that would produce the above entered signal.	
R<CR><LF> to return to normal weighing.	YES

Note: The calibration load is entered as a number without decimal point and must be a multiple of the indicator step size. i.e if the indicator maximum capacity is 100.00 and the step is 0.05 and the calibration load is 75.15 enter 7515 for num above.

Example: See the example for keypad entry of span calibration by mV/V entry at 6.2.2.

ERROR [n] : See the errors listing in section 6.3 above.

## 7. DISPLAYED AND OUTPUT VALUES

The relationship between gross, net and maximum display values are as follows.  
Those relationships also apply to BCD and RS232/RS485 output.

- (1) Gross display value = Gross value × (step width × multiplier)  
TARE function will be accepted when motion is not detected.
- (2) Net display value = Gross value – tare value  
TARE function will not be accepted when gross display value is less than zero.
- (3) Maximum display value = Maximum capacity + (9 × step width × multiplier)

When the gross value exceeds the maximum displayed value (even when the net displayed value is being displayed), the indicator displays "O.L.", and displays the gross value when the loading is within weighing range.

- (4) Minimum display value = a value corresponding to the minimum input signal. The zero or dead load produces a signal above the minimum input signal with an empty scale. The PT200MI will produce a negative reading for loads below the zero load until the point the minimum input signal is reached and will then display "-O.L".

## 8. INPUT/OUTPUT

### 8.1 INPUT

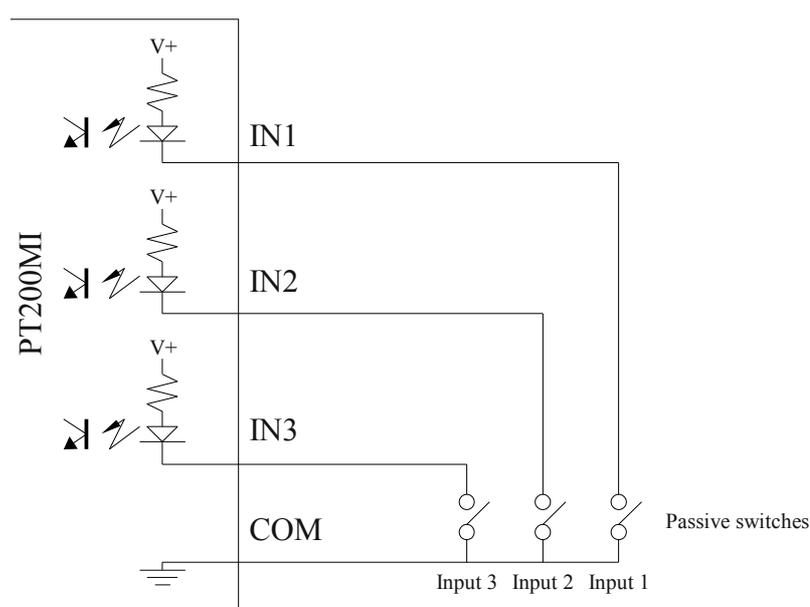
#### 8.1.1 INPUT CODE DESCRIPTION

0 = Function	When the input terminal is open, the function setting and calibration procedure is locked. When the input terminal is shorted to INPUT COMMON, the function setting and calibration procedure is activated. If another setting is selected, the lock function is deactivated.
1 = Zero	When the opto-coupler input is activated, this input has the same function as pressing the ZERO key on the keyboard.
2 = Tare	When the opto-coupler input is activated, this input has the same function as pressing the TARE key on the keyboard.
3 = Gross/Net	When the opto-coupler input is activated, this input has the same function as pressing the G/N key on the keyboard.
4 = Print	When the opto-coupler input is activated, the displayed value will be sent via the RS232/RS485 serial port (If the option is fitted).
5 = kg/lb	When the opto-coupler input is activated, the displayed value will change between kg and lb.
6 = On/Off	When the opto-coupler input is activated, the display will be turned on or off.
7 = Hold	When the opto-coupler input is activated, the current measured value will be held until the input is deactivated.
8 = Peak hold	When the opto-coupler input is activated, and the corresponding peak, valley or peak – valley function is set, the current measured value will be held until the peak hold input is deactivated.

#### 8.1.2 INPUT DESCRIPTION

Refer to the rear panel connector description on page 7 for the input terminal positions.

IN1 : Input 1  
 IN2 : Input 2  
 IN3 : Input 3  
 COM: common of IN1, IN2, IN3



Note: The input contact is a passive switch and closure delay time is 30 mS maximum.

## 8.2 COMPARATOR (SET-POINT) OUTPUT (OPTIONAL)

Refer to the appendix if installation of the option is required.

### 8.2.1 COMPARISON CONDITIONS

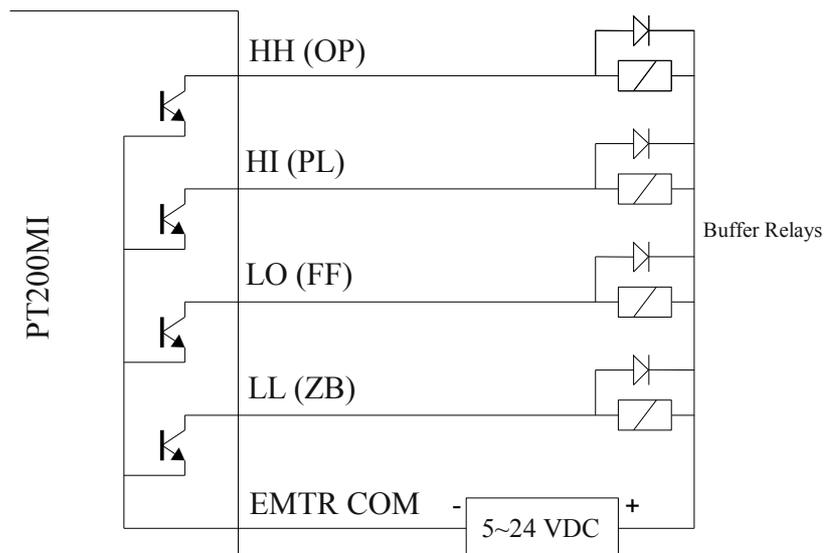
- 1) If comparison condition F19 = 0,  
 HH output on = gross weight value > HH set-point  
 HI output on = gross weight value > HI set-point  
 LO output on = gross weight value < LO set-point  
 LL output on = gross weight value < LL set-point
- 2) If comparison condition F19 = 1,  
 HH output on = net weight value > HH set-point  
 HI output on = net weight value > HI set-point  
 LO output on = net weight value < LO set-point  
 LL output on = net weight value < LL set-point
- 3) If comparison condition F19 = 2,  
 When the PT200MI displays gross weight value,  
 HH output on = gross weight value > HH set-point  
 HI output on = gross weight value > HI set-point  
 LO output on = gross weight value < LO set-point  
 LL output on = gross weight value < LL set-point

When the PT200MI displays net weight value,  
 HH output on = net weight value > HH set-point  
 HI output on = net weight value > HI set-point  
 LO output on = net weight value < LO set-point  
 LL output on = net weight value < LL set-point

### 8.2.2 COMPARATOR OUTPUT DESCRIPTION

The comparator outputs are open collector transistors. Please refer to the drawing on page 7 for the connection diagram. The bracketed items refer to the outputs when the single component batching software option is installed. The comparison rate is 200 times/Sec.

HH (OP)	High high set-point (Optional Preliminary)	LO (FF)	Low set-point (Free Fall)
HI (PL)	High set-point (Preliminary)	LL (ZB)	Low low set-point (Zero Band)
EMTR COM	Common for above		



The normal operating output rating is 5VDC to 24VDC and the max. current is 0.3A. Isolate PT200MI from external controlled devices in order to reduce interference. A diode should be connected in parallel with the DC operated buffer relay to protect the circuitry.

### 8.2.3 SETTING THE COMPARATOR SET-POINTS

All data relates to the value displayed in accordance with the setting of function F19.

Note the position of the decimal point and the division prior to entering setting mode as the value entered during setting should be in the same format as that set for display during function setup. i.e. if the scale has been set to show "100.00" at maximum capacity and the division is 5 then a set-point of 76.05 would be entered as 7605. The decimal point does not show as it is used to indicate the digit being set.

### 8.2.4 SETTING SET-POINTS

Enter the comparator setting mode: Press and hold **MODE**, then press the **ZERO** key, 2 seconds later the PT200MI displays "SET", a further 2 seconds later the gross annunciator begins flashing and the PT200MI displays "000000"

Step 1: HIGH HIGH set-point setting (HH)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the gross annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 2: HIGH set-point setting (HI)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the net annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 3: LOW set-point setting (LO)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the motion annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 4: LOW LOW set-point setting (LL)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the zero annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 5: HIGH HIGH hysteresis set-point setting (HH-S)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the gross annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 6: HIGH hysteresis set-point setting (HI-S)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the net annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 7: LOW hysteresis set-point setting (LO-S)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the motion annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 8: LOW LOW hysteresis set point setting (LL-S)

Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key.

During this step the zero annunciator flashes.

Accept the data by pressing the **MODE** key.

Step 9: Exit the comparison setting

Press **MODE** key to return to normal weighing mode.

An error will occur if the following setting condition is not satisfied:  $HH > HI > LO > LL$ , if an error occurs press the **MODE** key to redo from steps 1 to step 4.

Note: If one of the set-point value is zero then the value will not be used for comparison. For example:  $HH = 00$ , then "HH" is inactive.

### 8.2.5 SETTING COMPARATOR SETPOINTS USING RS232/RS485 (requires RS232 or RS485 option installed)

Set-point setting can be conveniently performed by using RS232/RS485 during normal weighing mode.

Refer to the section on RS232/RS485 for connection diagrams.

From the RS232 port, input a command "SET<CR><LF>", "CAL 1<CR><LF>", the display will show "SET" throughout the calibration setting mode.

From the RS485 port, input a command "<ENQ>IDXX<CR><LF>", indicator responds "<ACK>XX<CR><LF>", then input a command "SET<CR><LF>", the display will show "SET". XX is the indicator ID set in function F14 above.

The sequence of set-point setting via serial port involves sending a series of parameters followed by <CR><LF> and receiving a subsequent response from the PT200MI. If an invalid parameter is sent the PT200MI responds NO? <CR><LF> and a correct entry must be made. When the correct parameter has been sent the PT200MI send N<CR><LF> to move to the next stage.

**Note that commands are case sensitive.**

**Note that the factory setting for INPUT1 is FUNC and INPUT1 must be connected to COM to enter the setting mode.**

**Note: The set-point value is entered as a number without decimal point and must be a multiple of the indicator step size. i.e. if the indicator maximum capacity is 100.00 and the step is 0.05 and the comparison load is 75.15 enter 7515 for num.**

<i>Transmit</i>	<i>Response</i>
(RS485)<ENQ>IDXX<CR><LF> (RS232/RS485)FUNC<CR><LF>	(RS485)<ACK>XX<CR><LF> (RS232/RS485) S-HH [num]<CR><LF>
PT200 displays "FUNC"	

Step 1: HIGH HIGH set-point setting (HH)

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	S-HH [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	S-HI [NUM]<CF><LF> YES

Step 2: HIGH set-point setting (HI)

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	S-HI [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	S-LO [NUM]<CF><LF> YES

Step 3: LOW set-point setting (LO)

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	S-LO [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	S-LL [NUM]<CF><LF> YES

## Step 4: LOW LOW set-point setting (LL)

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	S-LL [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	HH-S [NUM]<CF><LF> YES

## Step 5: HIGH HIGH hysteresis set-point setting (HH-S)

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	HH-S [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	HI-S [NUM]<CF><LF> YES

## Step 6: HIGH hysteresis set-point setting (HI-S)

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	HI-S [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	LO-S [NUM]<CF><LF> YES

## Step 7: LOW hysteresis set-point setting (LO-S)

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	LO-S [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	LL-S [NUM]<CF><LF> YES

## Step 8: HIGH HIGH hysteresis set-point setting (LL-S)

<b>Transmit</b>	<b>Response</b>
[num]<CR><LF>	LL-S [num]<CR><LF>
<i>Options for [num]</i> The value of the required comparison weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	S-HH [NUM]<CF><LF> YES

An error will occur if the following setting condition is not satisfied:  $HH \geq HI \geq LO \geq LL$ ,  
transmit N<CR><LF> to restart from steps 1 to step 8.

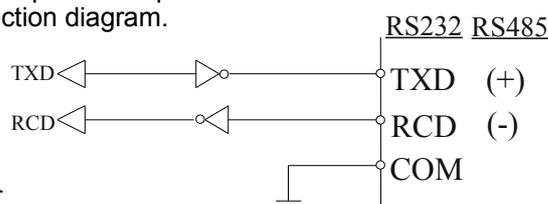
If one of the set-point values is zero then that comparison will not be performed.

## 8.3 RS232/RS485 INPUT/OUTPUT (OPTIONAL)

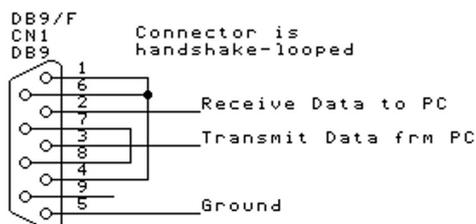
Refer to the appendix if installation of the option is required.

Refer to page 7 for the rear panel connection diagram.

Schematic diagram of the serial port.



Handshake looping a PC serial connector



While the normal PC hardware might well run with just Tx, Rx and Ground connected, some driver software will wait forever for one of the handshaking lines to go to the correct level. Depending on the signal state it might sometimes work, other times it might not. The reliable solution is to loop back the handshake lines if they are not used. Connect PT200MI terminal 10 to DB9 Pin 2, PT200MI terminal 11 to DB9 Pin 3, PT200MI terminal 12 to DB9 Pin 5.

### 8.3.1 RS232/RS485 COMMUNICATION PARAMETERS

Parameters are set in the function setting stage, section 5.

Baud rate	: 2400, 4800, 9600, 19200	Data bits	: 7 bits
Stop bit	: 1 bit	Parity bit	: 1 (even)
Code	: ASCII	Delimiter	: CR/LF

### 8.3.2 COMMUNICATION MODE

Two modes are available for weight output. Continuous and polled or command. The command mode also enables output of other values and configuration of the PT200MI.

Continuous mode:

- (1) Outputs the weighing data continuously in a pre-defined format shown above.
- (2) The output rate is in accordance with the BCD update setting times.  
 Select 4, 8, 16 or 20 times/sec at 19200 baud.  
 Select 4, 8, 16 or 20 times/sec at 9600 baud.  
 Select 4 or 8 times/sec at 4800 and 2400 baud.

Command mode:

In command mode a command is sent to the PT200MI and a response is received back. The commands vary upon the operational mode and are listed below.

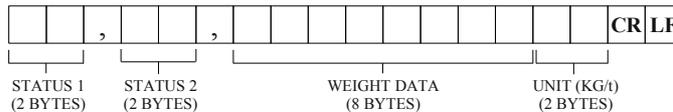
Command input	PT200MI response	Description
READ<CR><LF>	ST,GS,+ 1234kg<CR><LF> ST,NT,+ 200kg<CR><LF>	Weight data is output, output is gross data (GS) when the display shows gross weight and net data(NT) when the display shows net weight
TARE<CR><LF>	TARE 12345<CR><LF>	Responds with the tare weight.
TARE ON<CR><LF>	YES<CR><LF> or NO ? <CR><LF>	Sets tare. Tares the current reading
TARE OFF<CR><LF>	YES<CR><LF> or NO ? <CR><LF>	Resets tare.
TARE [num]<CR><LF>	YES<CR><LF> or NO ? <CR><LF>	Set tare (max. cap. ≥ tare value).
ZERO<CR><LF>	ZERO 1234<CR><LF>	Responds with the zero value.
ZERO ON<CR><LF>	YES<CR><LF> or NO ? <CR><LF>	Zero return range is 1% to 10% of max. capacity, the same action as pressing the zero key.
ZERO OFF<CR><LF>	YES<CR><LF> or NO ? <CR><LF>	Resets the zero offset.
KEY<CR><LF>	KEY ON<CR><LF> or KEY OFF<CR><LF>	Key protection state.

<b>Command input</b>	<b>PT200MI response</b>	<b>Description</b>
KEY ON<CR><LF>	YES<CR><LF> or NO ? <CR><LF>	Key protection on (key function inhibit).
KEY OFF<CR><LF>	YES<CR><LF> or NO ? <CR><LF>	Key protection off (key function enabled).
PROG<CR><LF>	Continuous weight output stops	Weight output in command mode.
CONT<CR><LF>	Continuous weight output starts	Weight output in continuous mode.
FUNC<CR><LF>	Z.TRACK T=[num]<CR><LF>	Enter function setting mode.
CAL<CR><LF>	CAL ZERO<CR><LF>	Enter calibration setting mode.
CAL 1<CR><LF>	CAL ZERO<CR><LF>	Enter calibration setting mode.
CAL2<CR><LF>	CAL ZERO<CR><LF>	Enter calibration setting mode.
SET<CR><LF>	S-HH [num]<CR><LF>	Enter set-point setting mode.
J<CR><LF>	(Refer calibration, section 6)	Exit zero calibration.
N<CR><LF>	(Refer appropriate section)	Move to the next setting stage.
R<CR><LF>	YES<CR><LF>	Return to normal weighing.
<ENQ>IDXX<CR><LF>	<ACK>XX<CR><LF>	Select the PT200MI with ID code XX. For use when RS485 is fitted.

### 8.3.3 WEIGHING DATA OUTPUT

Send a "READ<CR><LF>" command. After receiving the command via the RS232/RS485 port the following data is transmitted, the output data format is the same in continuous mode.

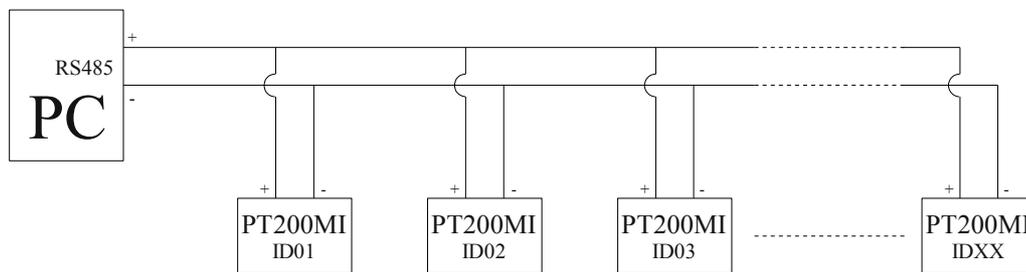
Data format



- STATUS 1 : OL = overload, ST = stable, US = unstable
- STATUS 2 : NT = net weight, GS = gross weight
- WEIGHING DATA : A stream of eight bytes consisting of "0" to "9", negative sign "-", positive sign "+", space " " and decimal point.
- UNIT : kg = kilogram, t = ton

### 8.3.4 RS485 COMMUNICATION

When the RS485 option is fitted multi-drop communications is possible to allow a single PC to communicate with up to 99 PT200MI indicators for display of weight or configuration.



**Note:** When multi-drop RS485 communications are to be used and ID = XX is set in the FUNC setting stage, the ST62 (TERMINATOR) jumper on the main board (bottom left of the BCD board) should be set to "ON", a 200Ω impedance matching resistor is added to the communication terminal. This applies to only the last PT200MI, ID=XX.

## 8.4 BCD DATA OUTPUT INTERFACE (OPTIONAL)

Refer to the appendix if installation of the option is required.

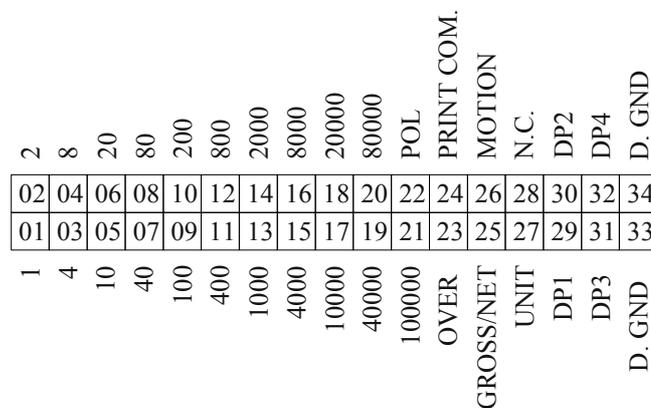
### 8.4.1 PIN DESCRIPTION

Pin No.	Signal	Pin No.	Signal
1	BCD1	18	BCD20000
2	BCD2	19	BCD40000
3	BCD4	20	BCD80000
4	BCD8	21	BCD100000
5	BCD10	22	LO= Negative polarity
6	BCD20	23	LO= Overload
7	BCD40	24	Print
8	BCD80	25	LO= Gross
9	BCD100	26	LO= Motion detected
10	BCD200	27	LO= kg
11	BCD400	28	N.C.
12	BCD800	29	LO= Decimal point 1/10
13	BCD1000	30	LO= Decimal point 1/100
14	BCD2000	31	LO= Decimal point 1/1000
15	BCD4000	32	LO= Decimal point 1/10000
16	BCD8000	33	Ground
17	BCD10000	34	Ground
Numeric data(6 digits)		21 bits	(positive logic)
Polarity		1 bit	(LO = negative)
Overload		1 bit	(LO = overload)
Decimal point		4 bits	(LO = select digit)
GROSS/NET		1 bit	(LO = GROSS)
MOTION		1 bit	(LO = unstable)
PRINT COMMAND		1 bit	(positive pulse, 5ms)
UNIT		1 bit	(LO = kg)
Total 31 bits			

Note: The output frequency depends on function setting data set in section 5.  
Data is output even if the indicator is out of range.

**Note:** The output is 5V TTL compatible. If interfacing to a PLC or PC ensure that a TTL compatible input card is used. Additional circuitry is required to interface to 24V inputs.

### 8.4.2 BCD CONNECTOR DIAGRAM



## 8.5 ANALOGUE OUTPUT (OPTIONAL)

Refer to the appendix if installation of the option is required.

Refer to the appendix for instructions on accessing the circuit boards, required for adjustment of the analogue options.

### 8.5.1 SPECIFICATION

Resolution : 1/10000  
Accuracy : 0.5% F.S

Output	0~5V	0~20mA	4~20mA
load resistor	Min.10 K $\Omega$	Max.500 $\Omega$	Max.500 $\Omega$
Output voltage/current when display value equals to 0	0V	0mA	4mA
Output voltage/current when display value equals to Max. capacity	5V	20mA	20mA

### 8.5.2 PIN No. DESCRIPTION

(Refer to the rear panel connector diagram on page 7.)

+ : Analogue output +  
COM : Analogue output -

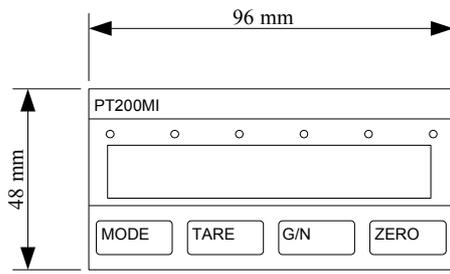
\* The excitation current available for load cell supply will be reduced to 120mA when the 0~20mA/4~20mA output board is fitted.

### 8.5.3 ADJUSTING THE ANALOGUE OPTION BOARD

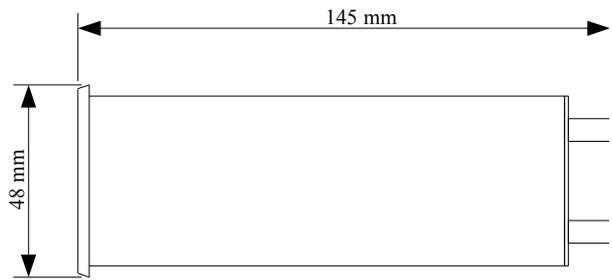
<b>4~20 mA/0~20 mA analogue option</b>	<b>0~5 V analogue option</b>
VR1 Zero adjust VR2 Span adjust	VR100 Zero adjust VR101 Span adjust VR102 No need adjust

To adjust the board to be 0~20mA or 4~20mA refer to the back of the 4~20 mA/0~20 mA analogue option. There are 2 solder bridges, one should be open and one should be closed. The bridge with the appropriate label ( 4~20 or 0~20) should be soldered across for the option to operate in this mode.

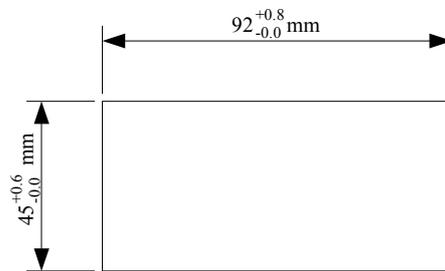
## 9. DIMENSIONS



Front view



Side view

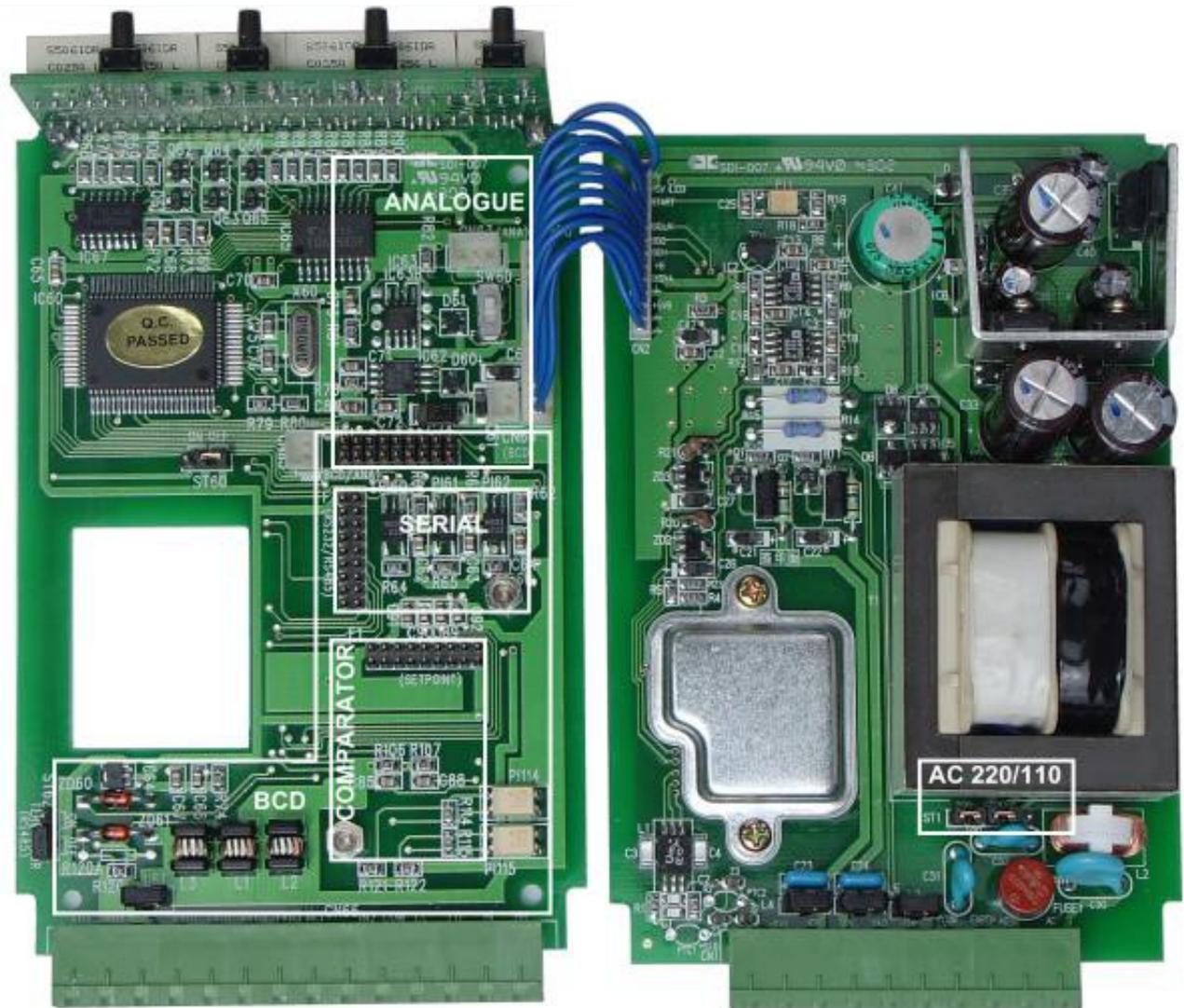


Panel cutout

# 10.0 APPENDIX

## 10.0 ACCESSING AND INSTALLING INTERNAL OPTIONS

Supply voltage selection and optional serial interface or output boards are fitted by accessing the internal circuit boards of the PT200MI. To gain access disconnect the rear connectors and remove the 4 screws in each corner of the rear panel. Inside the circuit boards can be seen retained in guide slots in the aluminium casing extrusion. Beneath the threaded holes where the rear panel retaining screws attached are 4 more small grub screws. Remove these screws with a small flat blade screw driver. Slide the connected pair of circuit boards from the casing and place on a clean work surface. The boards can be opened out flat and care should be taken to avoid damage due to static electricity.



### 10.1 PT200MI 110V AND 220V SETTING

The supply voltage selection jumpers are on the right hand circuit board just below the transformer. Set the jumpers both to the left as shown for 220 V ac operation and both to the right for 110 V ac operation.

## 10.2 INSTALLING RS232/RS485 SERIAL OPTIONS

The RS232 and RS485 are two different option boards. They are the same size and install into the same position on the parent circuit boards. Gently press the circuit board into place onto the connector (RS232/RS485) in the position shown ensuring the pins line up and secure with the screw provided.

**Note: When multi-drop RS485 communications are to be used and ID = XX is set in the FUNC setting stage, the ST62 (TERMINATOR) jumper on the main board (bottom left of the BCD board) should be set to "ON", a 200Ω impedance matching resistor is added to the communication terminal. This applies only to the last PT200MI in the multi-drop arrangement, the one with ID=XX. (ref8.3.4)**

## 10.3 INSTALLING THE COMPARATOR OUTPUT OPTION

The comparator option board installs into the parent circuit board just below the RS232 or RS485 option board. Gently press the circuit board into place onto the connector (SETPOINT) in the position shown ensuring the pins line up and secure with the screw provided.

## 10.4 INSTALLING THE 0~5 V ANALOGUE OUTPUT OPTION

The 0~5 V analogue output option board cannot be installed with a 0~20/4~20 mA output option board or a BCD output option board. The 0~5 V option board installs into the parent circuit board just above the RS232 or RS485 option board. Gently press the circuit board into place onto the connector (BCD/ANA) in the position shown and secure with the screw provided. Connect the 2 pin auxiliary connector of the option board to the adjacent socket CN85 and similarly for the 3 pin connector to CN63.

## 10.5 INSTALLING THE 0~20 mA/4~20 mA ANALOGUE OUTPUT OPTION

The 0~20/4~20 mA analogue output option board cannot be installed with a 0~5 V output option board or a BCD output option board. The 0~20/4~20 mA option board installs into the parent circuit board just above the RS232 or RS485 option board. Gently press the circuit board into place onto the connector (BCD/ANA) in the position shown and secure with the screw provided. Connect the 2 pin auxiliary connector of the option board to the adjacent socket CN85 and similarly for the 3 pin connector to CN63.

## 10.6 INSTALLING THE BCD OUTPUT OPTION

The BCD output option board cannot be installed with a 0~5 V output option board or a 0~20/4~20 mA output option board. The BCD option board installs into the parent circuit board over the top of the RS232/RS485 and comparator option boards using the same multi-pin socket (BCD/ANA) as the analogue options. Gently press the circuit board into place onto the connector in the position shown and secure with the two screws provided. Connect the 2 pin auxiliary connector of the option board to CN64.

## 10.7 SINGLE MATERIAL BATCHING CONTROL SOFTWARE OPTION

This function will **NOT** be available if the software option has not been ordered.

This function requires a comparator option card to be fitted. Refer to the comparator option section for connection details

This function requires factory configuration and must be ordered at time of indicator purchase.

### 10.7.1 KEYPAD SETTING STEPS

Enter the single material batching setting mode: Press and hold **MODE**, then press the **ZERO** key, 2 seconds later the PT200MI displays "SET", a further 2 seconds later the gross annunciator begins flashing and the PT200MI displays "000000"

#### Step 1: Final set-point setting

The display value is the final batch weight. Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key. During this step the gross annunciator flashes.

Accept the data by pressing the **MODE** key.

#### Step 2: Optional preliminary setting (OP or HH output)

The display value is the optional preliminary weight. This is the weight before the final set point at which the OP output will switch. Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key. During this step the net annunciator flashes.

Accept the data by pressing the **MODE** key.

#### Step 3: Preliminary setting (PL or HI output)

The display value is the preliminary weight. This is the weight before the final set point at which the PL output will switch. Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key. During this step the motion annunciator flashes.

Accept the data by pressing the **MODE** key.

#### Step 4: Free fall setting (FF or LO output)

The display value is the free fall weight. This is the weight of material already in motion that would fall into the hopper after the inflow is stopped. Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key. During this step the zero annunciator flashes.

Accept the data by pressing the **MODE** key.

#### Step 5: Zero band setting (ZB or LL output)

The display value is the zero band weight. This is the weight below which the hopper is considered to be empty. Select the digit to change by pressing the **ZERO** key and set the value by pressing the **TARE** key. During this step the kg annunciator flashes.

Accept the data by pressing the **MODE** key.

#### Step 6: Exit single material batching setup

Press **MODE** key to return to the normal weighing mode.

An error occurs if correct setting conditions are not satisfied

Final setpoint > Optional preliminary > Preliminary > Free fall. (> means greater than)

In this event press **MODE** key to restart from step 1 to step 5.

The logic table below defines the output states. Net value is the net indicator weight.

<b>Condition</b>	<b>OP(HH)</b>	<b>PL(HI)</b>	<b>FF(LO)</b>	<b>ZB(LL)</b>
Net value <= Zero band	ON	OFF	OFF	ON
Net value > Zero band <i>and</i> Net value < Optional preliminary	OFF	OFF	OFF	OFF
Net value >= Optional preliminary <i>and</i> Net value < (Final – Preliminary)	ON	OFF	OFF	OFF
Net value >= (Final – Preliminary) <i>and</i> Net value < (Final – Free fall)	ON	ON	OFF	OFF
Net value >= (Final – Free fall)	ON	ON	ON	OFF

### 10.7.2 RS232/RS485 SETTING STEPS. (An RS232 or RS485 option must be installed)

Set-point setting can be conveniently performed by using RS232/RS485 during normal weighing mode.

Refer to the section on RS232/RS485 for connection diagrams.

From the RS232 port, input a command "SET<CR><LF>", "CAL 1<CR><LF>", the display will show "SET" throughout the calibration setting mode.

From the RS485 port, input a command "<ENQ>IDXX<CR><LF>", indicator responds "<ACK>XX<CR><LF>", then input a command "SET<CR><LF>", the display will show "SET". XX is the indicator ID set in function F14 above.

The sequence of set-point setting via serial port involves sending a series of parameters followed by <CR><LF> and receiving a subsequent response from the PT200MI. If an invalid parameter is sent the PT200MI responds NO? <CR><LF> and a correct entry must be made. When the correct parameter has been sent the PT200MI send N<CR><LF> to move to the next stage.

**Note that commands are case sensitive.**

**Note that the factory setting for INPUT1 is FUNC and INPUT1 must be connected to COM to enter the setting mode.**

**Note: The set-point value is entered as a number without decimal point and must be a multiple of the indicator step size. i.e. if the indicator maximum capacity is 100.00 and the step is 0.05 and the set-point load is 75.15 enter 7515 for num.**

<i>Transmit</i>	<i>Response</i>
(RS485)<ENQ>IDXX<CR><LF> (RS232/RS485)FUNC<CR><LF>	(RS485)<ACK>XX<CR><LF> (RS232/RS485) FINAL [num]<CR><LF>
PT200 displays "FUNC"	

#### Step 1: Final set-point setting

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	FINAL [num]<CR><LF>
<i>Options for [num]</i> The value of the final required batch weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	OP. PRE [NUM]<CF><LF> YES

#### Step 2: Optional Preliminary setting (OP)

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	OP. PRE [num]<CR><LF>
<i>Options for [num]</i> The value of the optional preliminary weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	PRELIM [NUM]<CF><LF> YES

#### Step 3: Preliminary setting (PL)

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	PRELIM [num]<CR><LF>
<i>Options for [num]</i> The value of the preliminary weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	FREE FALL [NUM]<CF><LF> YES

#### Step 4: Free fall setting (FF)

<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	FREE FALL [num]<CR><LF>
<i>Options for [num]</i> The value of the final required batch weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	ZERO BAND [NUM]<CF><LF> YES

Step 5: Zero band setting (ZB)

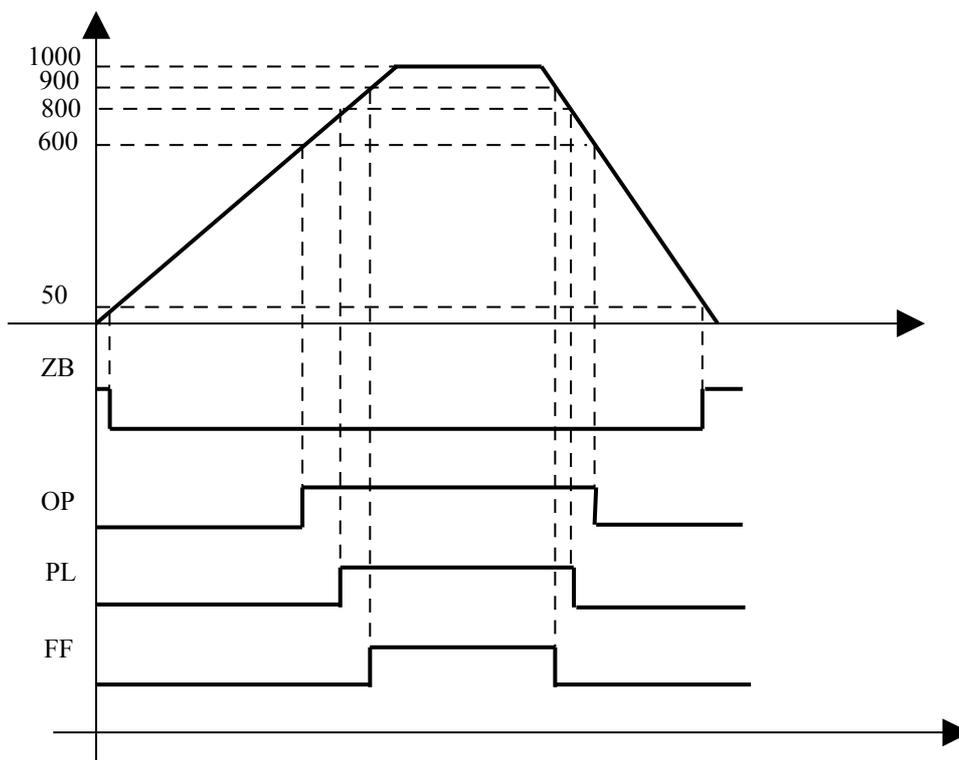
<i>Transmit</i>	<i>Response</i>
[num]<CR><LF>	ZERO BAND [num]<CR><LF>
<i>Options for [num]</i> The value of the final required batch weight.	
N<CR><LF> to move to the next setting. R<CR><LF> to return to normal weighing.	FINAL [NUM]<CF><LF> YES

An error occurs if correct setting conditions are not satisfied  
 Final setpoint > Optional preliminary > Preliminary > Free fall. (> means greater than)  
 In this event press input "N <CR><LF>" to restart from step 1 to step 5.

Step 6: Exit the set-point setting mode.

<i>Transmit</i>	<i>Response</i>
R<CR><LF> to return to normal weighing.	YES

For example:  
 Final setpoint = 1000      Optional prelim.(OP) = 400  
 Prelim.(PL) = 200      Free fall(FF) = 100  
 Zero band(ZB) = 50



**10.8 STANDARD ASCII CONTROL CODE TABLE**

Character	Hexadecimal code	Decimal code		Description
^@	00	00	NUL	Null character
^A	01	01	SOH	Start of Header
^B	02	02	STX	Start of Text
^C	03	03	ETX	End of Text
^D	04	04	EOT	End of Transmission
^E	05	05	ENQ	Inquire
^F	06	06	ACK	Acknowledgment
^G	07	07	BEL	Bell
^H	08	08	BS	Backspace
^I	09	09	TAB	Tab characters
^J	0A	10	LF	Line Feed
^K	0B	11	VT	Vertical Tab
^L	0C	12	FF	Form Feed
^M	0D	13	CR	Carriage Return
^N	0E	14	SO	Shift Out
^O	0F	15	SI	Shift In
^P	10	16	DLE	Data Link Escape
^Q	11	17	DC1	Device Control 1 (X-ON)
^R	12	18	DC2	Device Control 2
^S	13	19	DC3	Device Control 3 (X-OFF)
^T	14	20	DC4	Device Control 4
^U	15	21	NAK	Negative Ack
^V	16	22	SYN	Synchronize
^W	17	23	ETB	End of Text Block
^X	18	24	CAN	Cancel
^Y	19	25	EM	End of Media
^Z	1A	26	SUB	Substitute
^[	1B	27	ESC	Escape
^\ ^_	1C	28	FS	Form Separator
^]	1D	29	GS	Group Separator
^^	1E	30	RS	Record Separator
^_	1F	31	US	Unit Separator

## 10.9 PT200MI FUNCTION LIST

Function			Customer's files
No.	Description	Default	
F0 (0)	Exit setting	F0 = 0	
F1 (0 – 1)	Zero track time	F1 = 0 No track	
F2 (0 – 2)	Zero track band	F2 = 1 2 step width	
F3 (0 – 3)	Motion detection	F3 = 1 3 step width/sec	
F4 (0 – 5)	Multiplier or decimal point	F4 = 1 Decimal point	
F5 (0 – 2)	Division	F5 = 0 1 step width	
F6 (0 – 21)	Max. capacity	F6 = 11 10000	
F7 (0 – 3)	Baud rate	F7 = 2 9600 baud rate	
F8 (0 – 1)	RS232/RS485 output mode	F8 = 1 Command mode	
F9 (0 – 1)	Unit	F9 = 0 kg	
F10 (0 – 9)	Zero return range	F10 = 3 4%	
F11 (0 – 9)	Digital filter	F11 = 0 0	
F12 (0 – 4)	Display update rate	F12 = 4 20 times/sec	
F13 (0 – 7)	BCD output rate	F13 = 6 100 times/sec	
F14 (00 – 99)	RS485 ID code	F14 = 01 01	
F15 (0 – 6)	Peak hold	F15 = 0 No peak hold	
F16 (0 – 8)	Input 1	F16 = 0 Function	
F17 (0 – 8)	Input 2	F17 = 1 Zero return	
F18 (0 – 8)	Input 3	F18 = 2 Tare	
F19 (0 – 2)	Comparison condition	F19 = 0 Gross weight	

Note: Due to continuous product improvements product changes may occur without notification.

Refer to our web site at [www.ptglobal.com](http://www.ptglobal.com) for the latest information and revisions.