

PI100 SERIES





TEST AND ADJUSTMENTS


CELY

INDEX

1. PRECAUTIONS	1
2. SPECIFICATIONS	2
2.1. DIMENSIONS	3
3. INTRODUCTION.....	3
4. INSTALLATION	4
4.1. UNPACKING.....	4
4.2. LEVEL ADJUSTING.....	4
4.3. CONNECT ADAPTOR	5
5. KEY BOARD & DISPLAY	6
5.1. KEY BOARD	6
5.2. DISPLAY OVERLAY	7
5.3. DISPLAY SYMBOLS.....	7
6. PARAMETER.....	8
6.1. PARAMETER SETTINGS	8
6.1.1. ENTER INTO THE MENU	8
6.1.2. ENTER TO SELECTED MENU	8
6.1.3. SELECT THE MENU	8
6.1.4. RETURN TO WEIGHING MODE	8
6.1.5. ACTIVATE APPROVED TYPE PARAMETERS	8
6.2. PARAMETER MENU SETTINGS	9
7. PROTOCOLS.....	10
7.1. TISA CASH REGISTER PROTOCOL.....	10
7.2. APOLLO / SAMSUNG POLONIA CASH REGISTER PROTOCOL	11
7.3. DOLAR / SAMSUNG-SPAIN CASH REGISTER PROTOCOL	12
7.4. ECR-PN / ECR-POSNET PROTOCOL (SAMSUNG POLAND VARIANT) ..	13
7.5. DIAL06 / DIALOG 06 PROTOCOL.....	14
8. CALIBRATION.....	17
9. RS 232 OUTPUT.....	18
9.1. SPECIFICATIONS	18
9.2. RS-232 (9 PIN D TYPE CONNECTOR).....	18
10. ERROR CODES.....	19

1. PRECAUTIONS

	 WARNING
	<p>DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, CLEANING, OR SERVICING. FAILURE TO DO SO COULD RESULT IN BODILY HARM OR DAMAGE THE UNIT.</p>

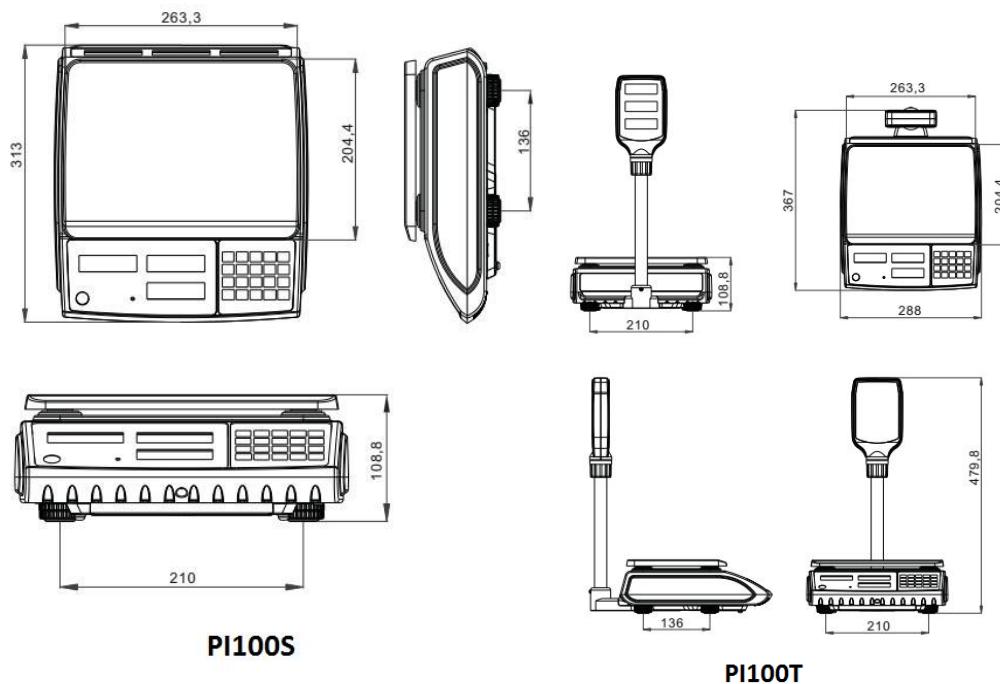
 CAUTION
<ul style="list-style-type: none">• Permit only qualified personnel to service the instrument• Before connecting or disconnecting any components, remove the power.• Failure to observe these precautions could result in bodily harm or damage to or destruction of the equipment.

- The price computing scale is a precision electronic instrument, handle it carefully.
- Do not install the scale in direct sunlight.
- Verify the local voltage and receptacle type are correct for the scale.
- Only use original adaptor, other could cause damage to the scale
- Pluggable equipment must be installed near an easily accessible socket outlet.
- Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.
- Avoid sudden temperature changes, vibration, wind and water.
- Avoid heavy RF noise.
- Keep the scale clean

2. SPECIFICATIONS

MODEL	PI100S		PI100T
DISPLAY	15MM LCD DISPLAY WITH WHITE LED BACK LIGHT		FRONT AND POLE: 15MM LCD DISPLAY WITH WHITE LED BACK LIGHT
GROSS WEIGHT	4.1KG		4.7KG
CAPACITY	3/6 KG	6/15 KG	15/30 KG
READABILITY	1/2 G	2/5 G	5/10 G
MAX. DIVISIONS	3000E/ 2X3000E		
WEIGHING UNITS	KG		
PAN SIZE	204X263MM		
HOUSING	ABS PLASTIC AND STAINLESS STEEL PAN		
INTERFACE	RS232 OUTPUT OPTIONAL		
OPERATION TEMPERATURE	-10°C + 40°C / 14°F - 104°F		
STABILISATION TIME	1 SECONDS TYPICAL		
POWER	AC ADAPTOR 12V/500MA , RECHARGEABLE BATTERY 6V/3.2AH		
KEYPAD	20 KEYS		
ZERO RANGE	0MV~5MV		
SIGNAL INPUT RANGE	0~15MV		
ADC	SIGMA DELTA		
INTERNAL COUNTS	600,000		
ADC UPDATE	MAX 60 TIMES /SECOND		
LOAD CELL DRIVE VOLTAGE	MAX 5V/150MA		

2.1. DIMENSIONS



3. INTRODUCTION

- PI100 series of economic price computing scales are very compact, reliable, have high accuracy and are very stable.
- It use LCD display with white led back-light, with the different back-light operation.
- It has 4 direct PLU keys and 10 indirect PLU ,it can store 14 unit price values
- Auto unit price clear operation
- RS-232 can be connected to computer and ECR

4. INSTALLATION

4.1. UNPACKING

Carefully take the scale out of its package, make it sure it's not damaged and all accessories are included.

Accessories,

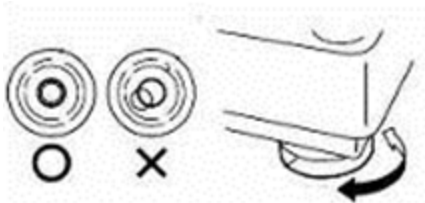
1. Scale
2. Adaptor
3. Stainless steel pan
4. Product manual

Keep the packaging material for your future use.

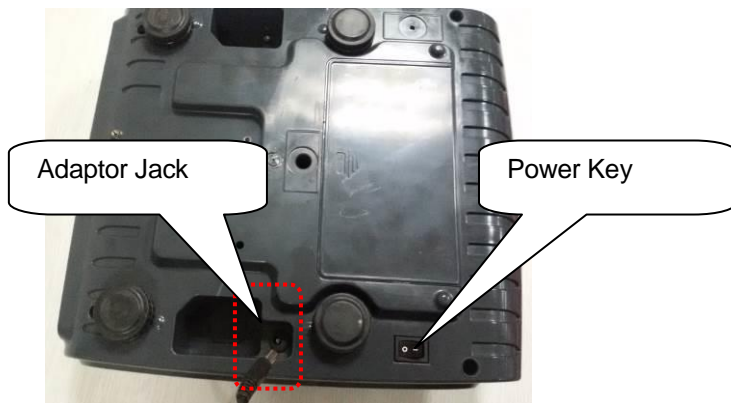
4.2. LEVEL ADJUSTING

Place the scale on a table.

Check the water mark. If the spirit level is not centred adjust the levelling feet until it reaches the centre. Check the level when you change the location.



4.3. CONNECT ADAPTOR



- To charge the battery insert the adaptor pin to jack adaptor, simply plug it into the mains power. The scale does not need to be turned on.
- The battery should be charged for 12 hours for full capacity.
- On the left side of the display there is a LED to indicate the status of battery charging. When the scale is plugged into the mains power, the internal battery will be recharged. If the LED is green, the battery has a full charge. If it is red, the battery is nearly discharged and if it is yellow, the battery is being charged.
- Do not use any other type of power adaptor than the one supplied with the scale
- Verify that the AC power socket outlet is properly protected.

NOTE: Please charge the battery before using the scale for the first time.

5. KEY BOARD & DISPLAY

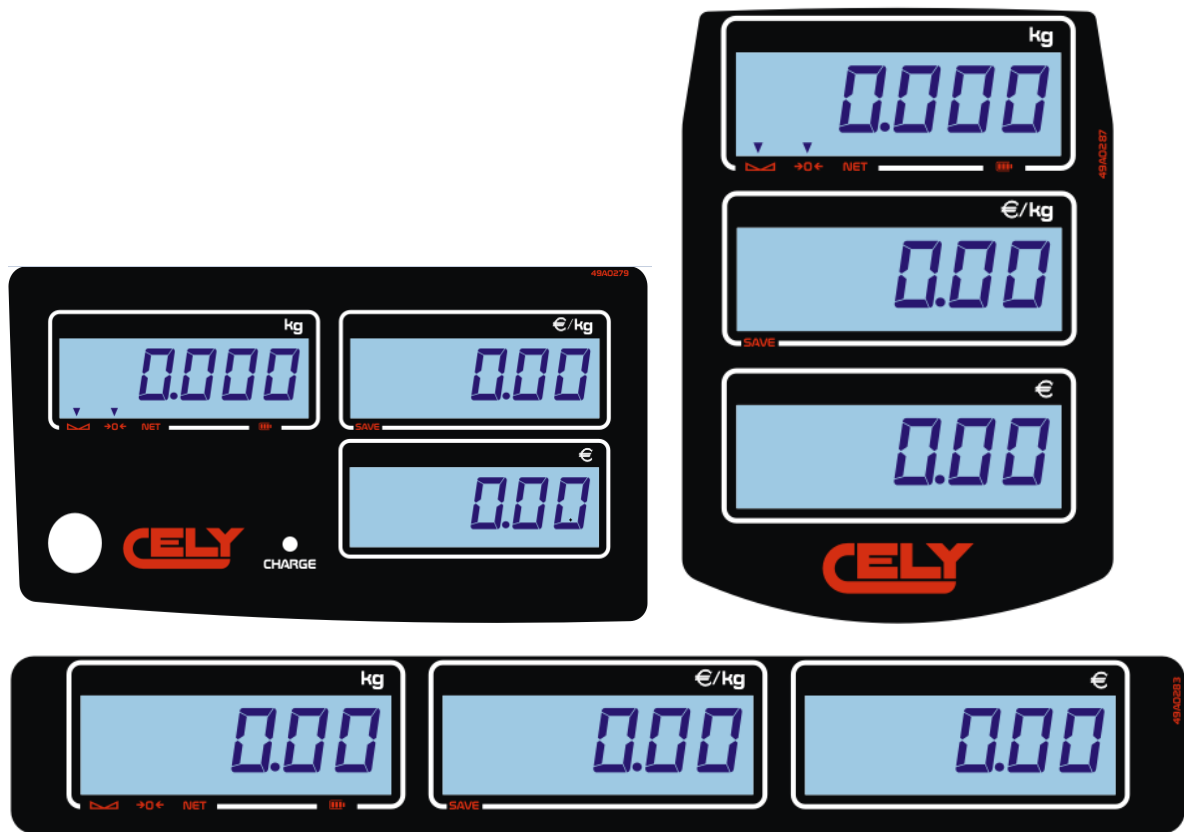
5.1. KEY BOARD



KEYS	PRESS THIS KEY TO
0 TO 9	Numeric keys, enter unit price / PLU; in setting mode, press numeric keys to enter parameters setting
C	Clear incorrect entries and error conditions
00	Press the key to input double zero
→0←	Returns the display to zero.
TARE	Subtracts the tare values, change to gross to net mode and enter parameter settings.
SAVE	Enter to auto clear mode
PLU	Used to store or recall unit price
1 TO 4	Direct PLU keys; in parameter settings 2 and 4 keys are used to change the menu.

TEST AND ADJUSTMENTS

5.2. DISPLAY OVERLAY





5.3. DISPLAY SYMBOLS

	Battery indicator. When it's illuminated, battery should be charged
Net	Net Weight
	Stable indicator. When it's illuminated, the scale is stable
	Zero indicator. When it's illuminated, the scale is in Zero point
kg	Kilogram Mode
SAVE	Save Indicator
CHARGE	Battery charging indicator

6. PARAMETER

6.1. PARAMETER SETTINGS



6.1.1. Enter Into the Menu

- Turn on the scale. Press and hold  key during the self-test.
- Display will show “PM” briefly if the pin is activated. Press the pin number to get into the parameter menu.
- The default pin number is “0000”
- Press numeric key 0 four times , display will show PM - - -
- Press  key to confirm, it will enter into the parameter settings and will show “FO CAL”.


6.1.2. Enter to Selected Menu

- Press  , it can confirm which will be displayed.

6.1.3. Select the Menu

- Press  or  . It can choose menu block one by one.

6.1.4. Return to Weighing Mode

- Press  to escape from the menu and exit to weighing mode

6.1.5. Activate Approved Type Parameters

- Press CAL switch to enable access and change any parameter. CAL switch is located in the bottom of the scale



TEST AND ADJUSTMENTS

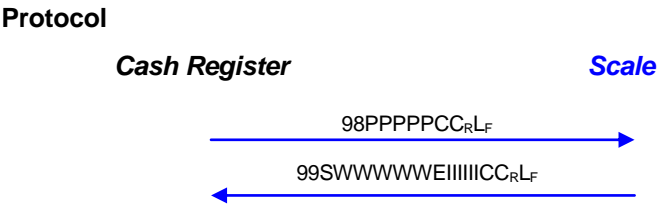
6.2. PARAMETER MENU SETTINGS

Menu	Sub-Menu		DESCRIPTION
F0 CAL	CALIBRATION		
F1 RES	3000		SET EXTERNAL RESOLUTION
	6000		
	dUAL		
	dUALr		
F2 CAP	3KG		SET SCALE CAPACITY
	6KG		
	15KG		
	30KG		
F3 PdEC	0		SET PRICE DECIMAL POINT
	00		
	000		
	0000		
	00000		
F4 PdESC	FĒ		SET UNIT PRICE TO FIX OR FLOATING
	FLoAt		
F5 SPEED	SlOw		TO SELECT A/D SPEED
	nEdUc		
	FAST		
F6 Min Coin	1/2/5/10		SELECT MINIMUM COIN
F7 SECURE tArE	on		MULTI - TARE FUNCTION ON
	oFF		MULTI - TARE FUNCTION OFF
F8 In	THIS DISPLAY WILL SHOW XXXXX FOR INDICATING THE INTERNAL COUNTS.		
F9 GrA	TO SET YOUR LOCAL GRAVITY VALUE.		
F10 rESet	FACTORY DEFAULT SETTINGS		
F11 RS232	ModE	oFF	RS232 FUNCTION DISABLE
		tSA	TISA CASH REGISTER PROTOCOL
		APoLLo	APOLLO / SAMSUNG POLONIA CASH REGISTER PROTOCOL
		dOLAr	SAMSUNG-SPAIN CASH REGISTER PROTOCOL
		ECrPn	ECR-POSNET PROTOCOL (SAMSUNG POLAND VARIANT)
		dIALOG	DIALOG 06 PROTOCOL
	bAUD		SET BAUD RATE TO(1200/2400/4800/9600/19200/38400/115200)
	Pr	8n1	8 DATA BITS, NO VERIFY, 1 STOP BIT
		7E1	7 DATA BITS, EVEN VERIFY, 1 STOP BIT
		7o1	7 DATA BITS, ODD VERIFY, 1 STOP BIT

7. PROTOCOLS

In this section the protocols are going to be described.

7.1. TISA CASH REGISTER PROTOCOL



Where:

98:	0x39h y 0x38h
PPPPP:	5 characters for price.
C:	Checksum, logic add (XOR) of all previous characters.
C _R :	0x0Dh
L _F :	0x0Ah
99:	0x39h y 0x39h
S:	Weight status. 0: 0x30h Correct. 1: 0x31h Error.
WWWWW:	5 characters for weight.
E:	Amount status. 0: 0x30h Correct. 1: 0x31h Error.
IIIII:	6 characters for amount.

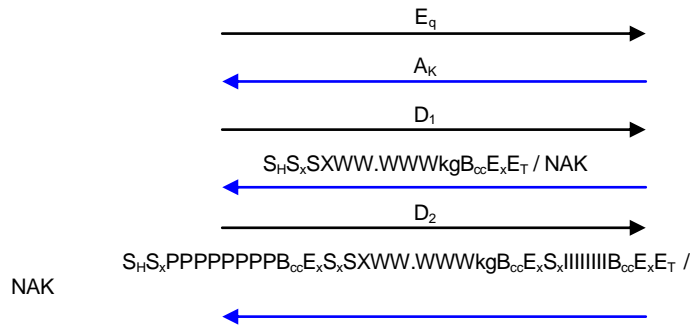
- NOTE:
- If the weight is unstable the scale send the momentary weight with the value 1 on fields E and S and amount field to 000000.
 - If the weight is negative or erroneous the scale sends the value 1 on fields E and S, the amount and price fields to zero.
 - If the amount overflows the scale send zeros on the amount field.
 - The scale takes into account the minimum weight adjustment. If this adjustment has the value 1 the scale sends the field S to 1 and the weight to zero if the weight is lower than 20 steps.
 - Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale sends the field S to 1 together to weight.
 - If the scale has a tare weight, it sends the net weight in the field **WWWWW**.
 -

7.2. APOLLO / SAMSUNG POLONIA CASH REGISTER PROTOCOL

Protocol

Cash Register

Scale



Where:

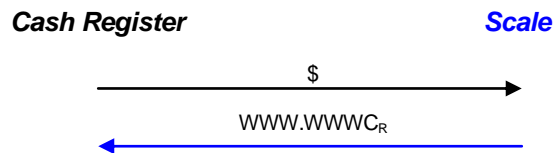
E_q:	0x05h	A_K:	0x06h
D₁:	0x11h	D₂:	0x12h
S_H:	0x01h	S_X:	0x02h
S:	Weight status.		
	0x53h stable.		
	U: 0x55h Unstable.		
X:	0x20h, 0x46h, 0x2Dh		
PPPPPPPP:	8 characters for price (the first 2 to 0).		
WWWWW:	5 characters for weight.		
IIIIII:	8 characters for amount (the first 2 to 0).		
..:	0x2Eh		
kg:	0x6Bh y 0x67h		
B_{cc}:	Checksum, logical sum (XOR) from S of weight status..		
E_x:	0x03h		
E_T:	0x04h		
NAK :	0x15h		

NOTE:

- The **X** can take the values:
 - o ' ' (0x20): when the weight is valid.
 - o 'F' (0x46): when the weight is erroneous or invalid.
 - o '-' (0x2D): when the weight is negative (for example: Tare without plate).
- The **S** can take the values:
 - o 'S' (0x53): when the weight is stable.
 - o 'U' (0x55): when the weight is unstable.
- If the weight is unstable momentary value is sent in the field **WW.WWW**. For the answer **D₂**, the price entered on the scale is sent and the amount is sent to 0.
- If the weight is erroneous (with "-----" on the display) the Scale replaces the X and the weight by FFFFFFFF. In the case of the D2 response frame, the price is the entered on the Scale and the amount is displayed to zero.
- If the scale has a tare weight, it sends the net weight in the field WWWWW.
- If when the frame **D₂** is sent the weight is negative, the scale responds with the price entered on the scale and the amount to zero.
- If the scale receives a frame with an incorrect format, the scale responds with **NAK**.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1 the scale responds with **NAK** if the weight is lower than 20 steps.
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale responds with **NAK**.
- The minimum variation or zero crossing, and adjustment of minimum weight, also affect to request frame of only weight

7.3. DOLAR / SAMSUNG-SPAIN CASH REGISTER PROTOCOL

Protocol



Where:

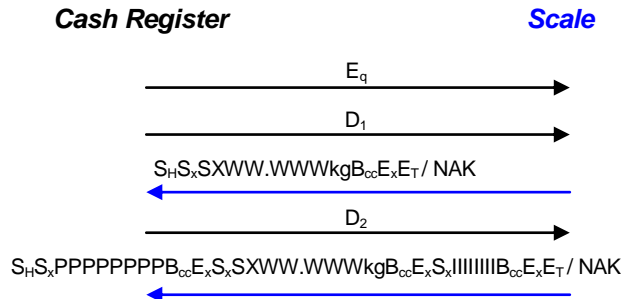
\$:	0x24h	
WWWWWW :	6 weight characters	
. :	0x2Eh	C _R :0x0Dh

NOTE:

- The scale responds to \$ with positive, stable within range weight. If they are unstable or out of range, the scale wait until it has stable positive within range weight.
- The digits of the weight whole part are set to zero when the weight do not have units, tens or hundreds
- If the scale has a tare weight, it sends the net weight in the field **WWWWWW**.

7.4. ECR-PN / ECR-POSNET PROTOCOL (SAMSUNG POLAND VARIANT)

Protocol



Where:

E_q:	0x05h	D₂:	0x12h
D₁:	0x11h	S_X:	0x02h
S_H:	0x01h		
S:	Weight status.		
	S: 0x53h		stable.
	U: 0x55h		Unstable.
X:	SPACE: 0x20h U: 0x46h -: 0x2Dh		
PPPPPPPP:	8 characters for price (the first two to zero).		
WWWWW:	5 characters for weight.		
IIIIII:	8 characters for amount (the first two to zero).		
..:	0x2Eh		
kg:	0x6Bh y 0x67h		
B_{cc}:	Checksum, logic add (XOR) from S to weight status.		
E_x:	0x03h		
E_T:	0x04h		

NOTE:

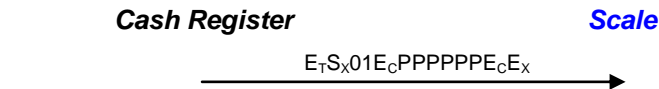
- If the sequence or the message format that the scale receives is incorrect, the scale responds with **NAK**.
- The 'X' is a character which can take more than one value depending on weight status.
 - **Space** (0x20): when the weight is correct.
 - **'U'** (0x46): when the weight is not valid or erroneous.
 - **'-'** (0x2D): when the weight is negative (for example: Tare weight without plate).
- When the quantity in absolute value is <1000 the leading zeros are fill with "0" (0x30h), but if the quantity in absolute value is >=1000 they are fill with " " (0x20h).
- If the weight is erroneous (with "-----" on the display) the scale replace the X and the weight by **FFFFFF**. In the answer to the frame **D₂**, the amount is set to zero.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.
- If when the frame **D₂** is sent the weight is negative, the scale responds with the introduced price, negative weight and amount to 0.
- If the scale receives a frame with incorrect format, it responds with **NAK**.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1 the scale responds with **NAK** if the weight is lower than 20 steps.
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale responds with **NAK**.
- The minimum variation or zero crossing, and the adjustment of minimum weight, also concerns to weight request.

7.5. DIAL06 / DIALOG 06 PROTOCOL

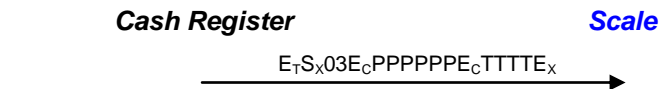
Protocol

There are four different frames.

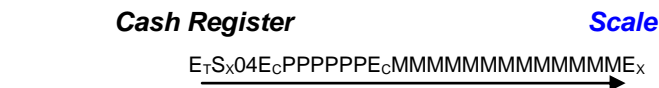
Frame 1



Frame 2



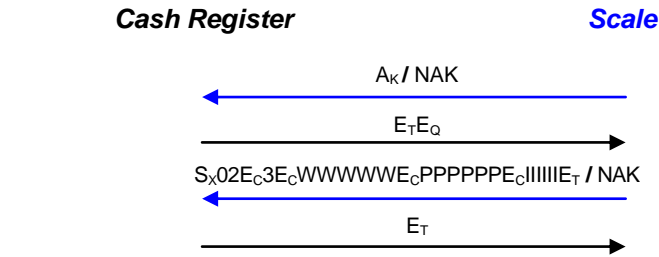
Frame 3



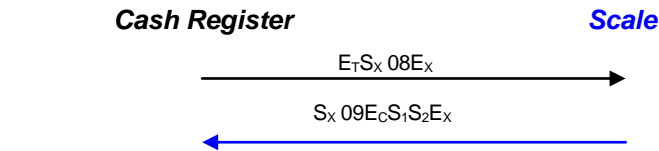
Frame 4



From the 4 different frames the protocol function as follows



If there is an error situation, the scale responds with NAK. These errors can be identified sending the status frame:



Where:

E_T :	0x04h	
S_X :	0x02h	
A_K :	0x06h	
NAK:	0x15h	
E_C :	0x1Bh	
E_Q :	0x05h	
0:	0x30h	1:
	0x31h	
2:	0x32h	3:
	0x33h	
4:	0x34h	5:
	0x35h	
WWWWW:	5 characters for weight	
PPPPPP:	6 characters for price	
IIIII:	6 characters for amount	

TTTT:	4 digits for the PLU tare
MMMMMMMMMMMMMM:	13 digits for the PLU description (ignored by the scale)
S₁S₂:	Status
0 0 :	Correct.
0 1 :	General error. Start-up error, adjustment error...
0 2 :	Parity error or more than available characters. IS NOT PROCESSED
1 0 :	Frame number incorrect (numeric field on header).
1 1 :	Base price not valid.
1 2 :	Tare not valid.
1 3 :	Received text not valid. IT IS NOT PROCESSED.
2 0 :	Unstable weight.
2 1 :	The weight does not vary from the last operation.
2 2 :	The amount is not calculated.
3 0 :	Minimum weight range. Weight 00.000
3 1 :	Negative weight, "-----" on display.
3 2 :	Overload, "-----" on display.

NOTE:

- Cash Register / Scale synchronization sequence

When the scale receives the frames 1, 2, 3, or 4:

- The first time that is switch on,
- If there has been a parity error,
- If it has carried out 50 weight operations,

Responds with the frame of correction values request:

S_x11E_c2ZZE_x

Where **ZZ** is a directly dependent to momentary weight calculated number

The Cash Register responds to the previous frame with:

E_TS_x10E_cVWXYZE_x

Where **V, W, X, Y, Z** are groups of 8 checksum characters calculated from number **ZZ**. At least the **V** has to be calculated.

Then the Scale responds with **ACK**.

The Cash Register sends the frame:

E_TE_Q

And then the scale sends the frame

S_x11E_c1E_x if all is all right.

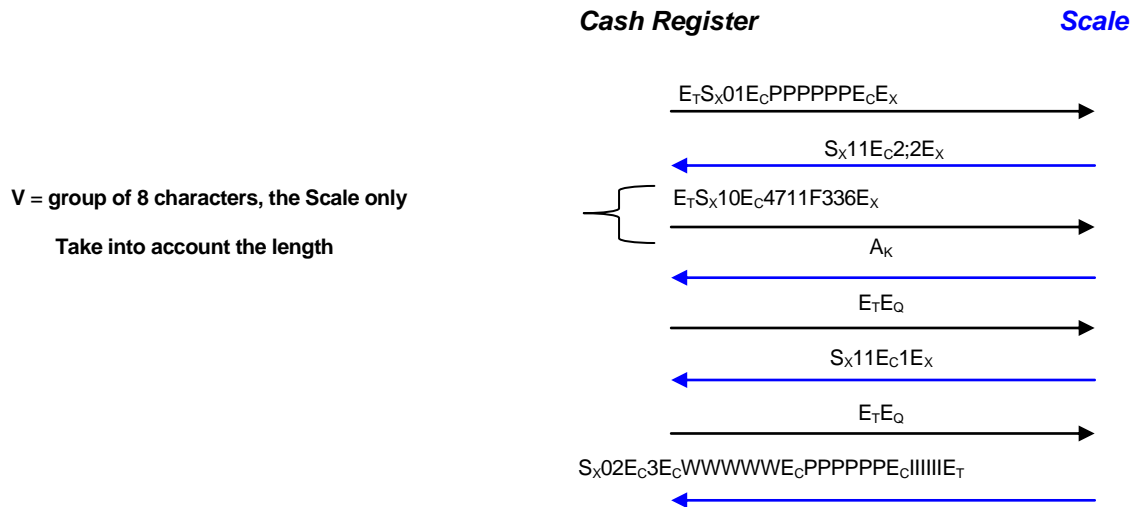
To finish the Cash Register sends again the frame:

E_TE_Q

And the scale responds

S_x02... with the corresponding data
or
NAK if it has been an error.


Synchronization example: - 1 kilo on the scale



- When the scale detects an error for one of the following reasons, it responds with **NAK** to frames 1, 2, 3, or 4 :
 - Be in error status
 - Parity error
 - Received frame erroneous
 - Base price not valid
 - The tare is not valid
 - Negative weight







- When the scale detects an error for one of the following reasons, it responds with **NAK** to frame **E_TE_Q**:
 - Be in error status
 - Parity error
 - Received frame erroneous
 - Base price not valid
 - The tare is not valid
 - Weight unstable
 - Amount overflows
 - The weight does not varied
 - Minimum weight
 - Zero weight
 - Negative weight
 - Weight out of range

8. CALIBRATION

Turn on the scale. Press and hold  key during the self-test.

Display will show "PM" briefly if pin is activated. Press the pin number to get into the parameter menu.

The default pin number is "0000"

- Press numeric key 0 four times , display will show PM - - -
- Press  key to confirm, it will enter into the parameter settings and will show "FO CAL" .
- Press CAL switch to enable settings
- Press  key to confirm calibration, display will show "UNLOAD"
- Remove the goods from the platform and make sure the stable indication shows on the display.
- Press  key to confirm
- Display will show, CAP LOAD XX
- If it is necessary change the calibration weight value by pressing  key and place the calibration weight on the platform.
- Press  key to confirm when display gets stable, display will show "PASS"
- Calibration is finished and display will come to FO CAL
- Remove the calibration weight from the platform.
- Press  key to go back to the weighing mode.

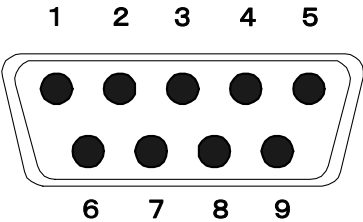
9. RS 232 OUTPUT

The PI100 series of scales can be ordered with an option RS-232 output.

9.1. SPECIFICATIONS

- RS-232 output of weighing data
- ASCII code
- 4800~115200 baud
- 8 data bits
- No parity

9.2. RS-232 (9 PIN D TYPE CONNECTOR)



PIN 2	RXD	INPUT	RECEIVING DATA
PIN 3	TXD	OUTPUT	TRANSMISSION DATA
PIN 5	GND	—	SIGNAL GROUND

9pin D Connector:

Scale	Cash Register
Pin 2:	Pin 2
Pin 3:	Pin 3
Pin 5:	Pin 5

10. ERROR CODES

ERROR MESSAGE	DESCRIPTION	SOLUTION
	Maximum load exceeded	Unload or reduce weight
Err 1	Incorrect date	Enter the date by using format “yy:mm:dd”
Err 2	Incorrect time	Enter the time by using format “hh:mm:ss”
Err 4	Zero setting error	Zero setting range exceeded due to switching on.(4%max) Make sure that the platform is empty.
Err 5	Key board error	Check the keys and connector.
Err 6	A/d value out of range	Make sure that the platform is empty and check if the pan is installed properly. Check the load cell connectors.
Err 7	Percentage error	Value should be (0.01% of the weight > 0.5d)
Err 9	Unstable reading	Check any air variation, vibration, RF noise and if anything is touching somewhere. Check the load cell and connectors.
Err 10	Communication error	No data (RS-232, continuous communication)
Err 15	Enter gravity error	Gravity range (0.9~1.0)
Err 17	Tare out of range	Remove the load and restart the scale again.
Err19	Initialize zero error	Calibration the scale.
--OL--	Over range	Remove the load. Recalibrate
FAi L H / FAi L L	Calibration error	Recalibrate
Err P	Printer error	Check the printer and settings
bA Lo / Lo bA	Battery low	Charge the battery, check the voltages.

The information in this manual may be modified by the manufacturer without prior notice.

Ref.: 49TPI10EN04 REV 04 21/07/2017

CELY