DPOS400
SERIE

TEST AND ADJUSTMENTS MANUAL

DIBAL

Ref:: 49-TGDP4ES02 – V.1.08

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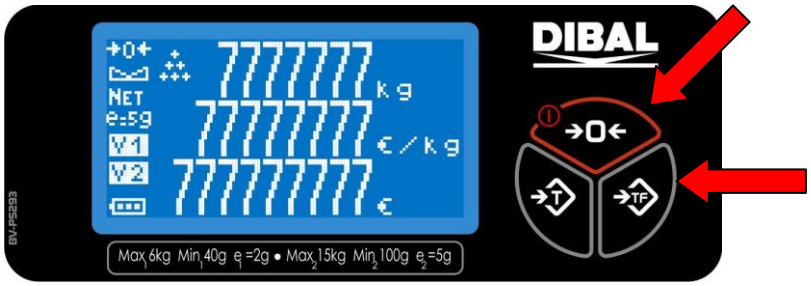
1. TEST

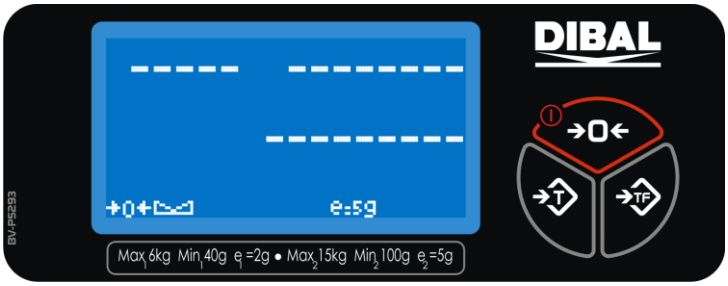
The test functions permit the user to check all of the important elements of the scale in order to assure that they function correctly; or in the case of a malfunction, find the faulty element quickly. The scale must be turned off to leave test mode.

1.1 ENTERING TEST MODE

When the scale is turned on, a segment test is run showing a count down from 9 to 0. **In order to enter test mode**, press the two outside keys on the bottom row of the keyboard: →TF and →0←, before the countdown reaches 0. Backlighting is on while the equipment is in mode test.



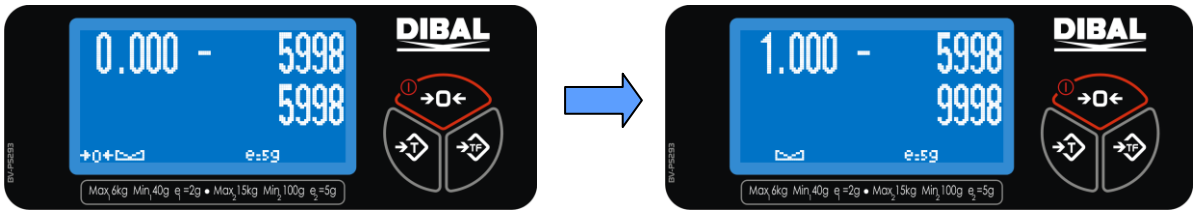
The scale will show hyphens in all the display's digits, followed by the following information.



1. The weight value in grams is shown in the weight display.

2. The zero weight value in internal divisions is shown in the price per kilogram display. This value is accompanied by a hyphen, which is in the center segment if the value is in the limits set when the scale was adjusted or in the upper or lower segments if the value is greater or lesser than the limits respectively.

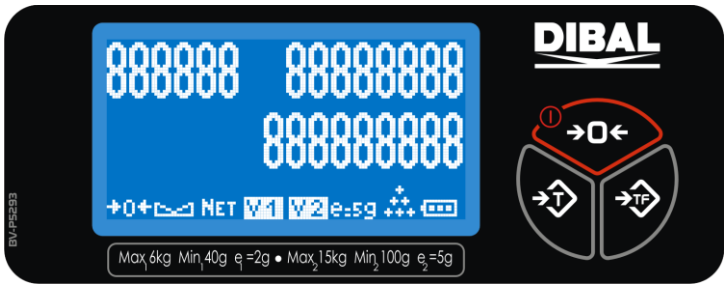
3. The weight value in internal divisions is shown in the amount display.



This will be referred to as test ready, and is the beginning point for all the tests to be done.

1.2 DISPLAY TEST

This allows the user to assure that there are no problems with the display. Being main screen of test mode, press the key [TF] and then hold the key [→0←]. Be careful, if you hold the key [→0←] a lot of time, the scale will shut down.



Press 3 times the key [TF] to return to the main screen.

1.3 KEYBOARD TEST

To verify the correct operation of keys is enough to press the different buttons and see if it beeps.

Filter

This adjustment allows choosing the working mode of the scale, only weight or price, weight amount. The adjustment can take two different values, as is shows follow:

Filter = 0 Only weight

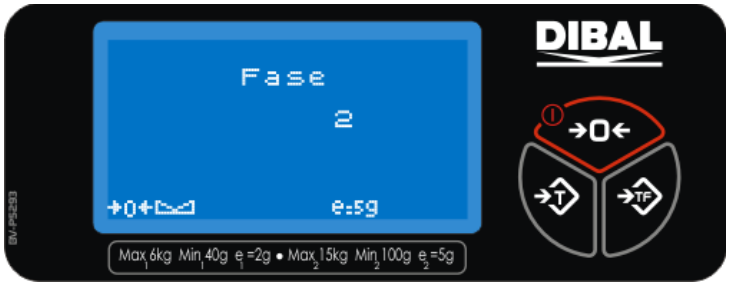
Filter = 1 Price, weight and amount

Press the key [TF] to enter to this menu. The value can be changed pressing the key [T].

Press 3 times the key [TF] to return to the main screen.

1.4 Euro phase

This adjustment indicates the phase of the Euro. To change the phase you have to enter the corresponding code from attached table.



From	To	Code
Phase 0	Phase 1	0781
Phase 1	Phase 2	6022
Phase 2	Phase 3	9808
Return to initial phase		2149

Press 2 times the key TF to enter to this menu.

To introduce the code you have to press again the key TF. Then press the key T to change the first number. Use the key 0 to select the following number.

Press the key TF to apply the changes (if the code is incorrect the scale does not do anything) and return to the main screen.

2 CALIBRATION

These functions allow the user to program, adjust and calibrate the scale.

The scale must be turned on for at least two hours before being adjusted. It must also be perfectly level and the temperature and humidity must be stable. The user must have a calibrated weight relative to the scale capacity.

The keys have the following functions:

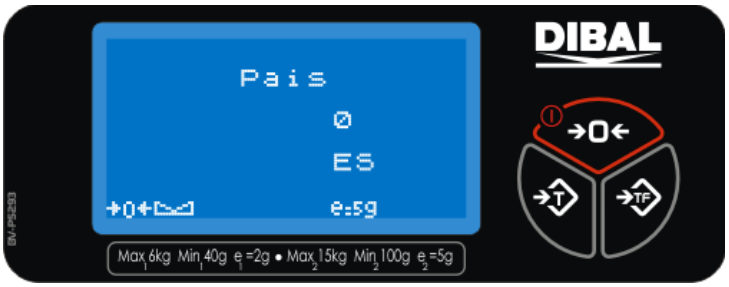
Key	Function
→T	Increase the programming value.
→0←	Decrease the programming value.
→TF	Accept the value and move on to the next.

Turn the scale on, and while it is counting down from 9 to 0, press the two keys together, →0← and →TF; The scale will enter test ready. Next, press the adjustment key found on the CPU. This may be accessed by removing the sealed screw and inserting a pointed object in the opening.

⚠ This should only be done by authorized personnel.

2.1 COUNTRY

Select the country code. The language of message and the rounding will modified according to the country.



To change the country press the key →T or →0←. Press the key →TF to program the next field.

Code	Country	Code	Country
0	Spain	20	-
1	Deutschland	21	Denmark
2	Austria	22	Ukraine
3	Belgium Flemish	23	Poland
4	Belgium French	24	Ireland
5	Costa Rica	25	Holland
6	Estonia	26	Brazil
7	France	27	Argentina
8	Greece	28	Tunis
9	-	29	Serbia
10	UK	30	Morocco
11	Italy	31	Bosnia
12	Peru	32	Slovakia
13	Dominican Rep.	33	Croatia
14	Czech Republic	34	Colombia
15	Sweden	35	-
16	Switzerland	36	Slovenia
17	Venezuela	37	Latvia
18	Portugal	38	Hungary
19	Finland	39	Latvia

Code	Country	Code	Country
40	Romania	60	Bahrain
41	-	61	Australia
42	Bulgaria	62	USA
43	-	63	India
44	South Africa	64	Emirates Arabs
45	Pakistan	65	Mexico
46	Thailand	66	Indonesia
47	Panama	67	Oman
48	Guatemala	68	Iran
49	Philippines	69	Egypt
50	-	70	French Polynesia
51	Cyprus	71	Switzerland (French)
52	Algeria	72	Russia
53	Saudi Arabia	73	New Caledonia
54	Iceland	74	Jordan
55	Singapore	75	Malt
56	Lebanon	76	
57	Vietnam	77	
58	Kenya	78	
59	Turkey	79	

2.2 IML PROGRAMMING

This allows the user to set a series of parameters as recommended by the OIML. This parameter cannot be modified.

Press the key TF to program the next field.

2.3 CAPACITY PROGRAMMING

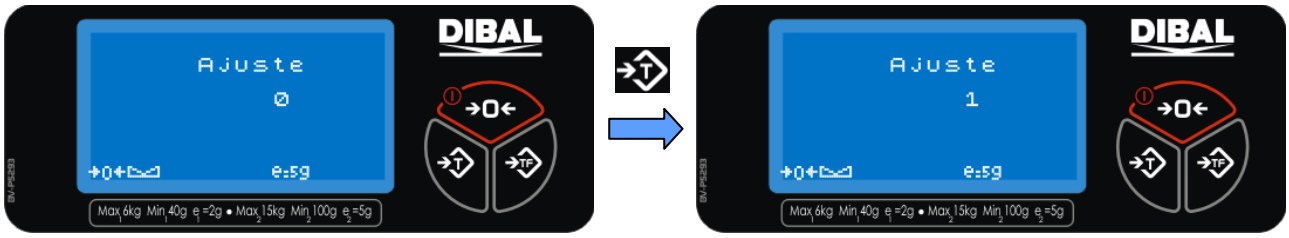
This allows the scale capacity to be selected according to the following table.

Code	Capacity
1	6 kg
2	15 kg
16	6/15 MR

Press the key T to increase the programming value
Press the key 0 to decrease the programming value
Press the key TF to program the next field.

2.4 ADJUSTMENT

This allows an adjustment to be done. The default value of 0 will always be shown. Change the value pressing the key T and then press the key TF to program the next field. **Do not enter this option if you are not qualified or if you do not have the calibrated weights.**



This should only be done by authorized personnel.

The following sections will only be visible when this parameter will set to 1.

2.4.1 LATITUDE ADJUSTMENT

This allows the adjustment to be modified according to the latitude at which the scale is to operate without carrying out a complete adjustment with calibrated weights. Program a value between 0 and 90.

Press the key →T to increase the programming value

Press the key →0← to decrease the programming value

Press the key →TF to program the next field.

2.4.2 ALTITUDE ADJUSTMENT

This allows the adjustment to be modified according to the altitude at which the scale is to operate without carrying out a complete adjustment with calibrated weights. Program a value between 0 and 9999 corresponding to meters above sea level.

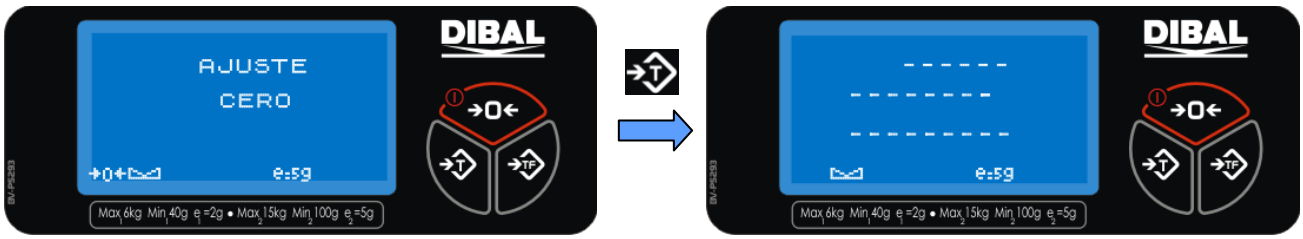
Press the key →T to increase the programming value

Press the key →0← to decrease the programming value

Press the key →TF to program the next field.

2.4.3 ZERO WEIGHT ADJUSTMENT

This will carry out an non-reversible calibration process with the scale. To do this adjustment, the user must have the corresponding calibrated weights according to the maximum scale capacity. If the adjustment is to be done, remove all of the weight from the plate and press the key to begin the zero weight adjustment. During the adjustment process, the display will show hyphens. This process lasts various seconds.



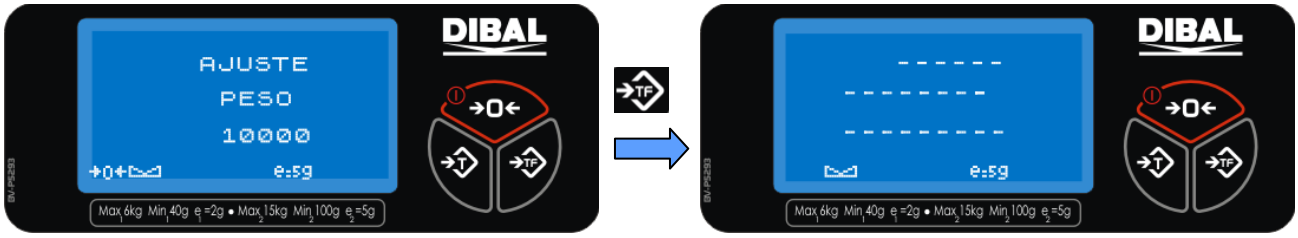
Press the key to increase the programming value

Press the key to decrease the programming value

Press the key to program the next field.

2.4.4 WEIGHT ADJUSTMENT

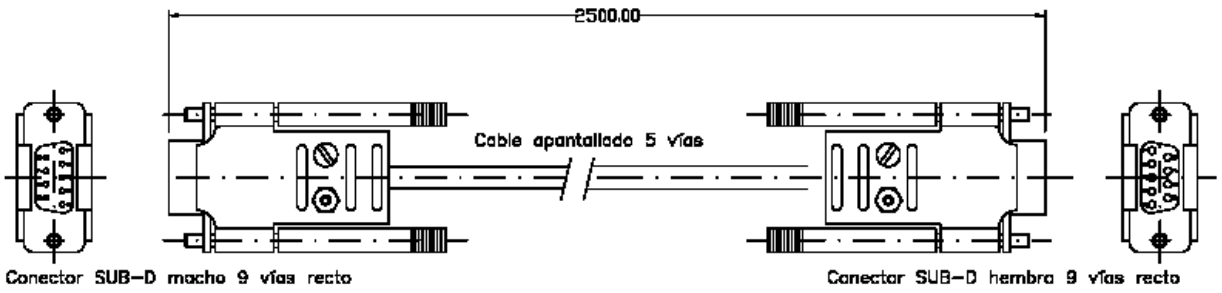
Once the zero weight adjustment is made, the display will show a default weight, relative to the scale capacity, to be used in the weight adjustment. This adjustment weight may be modified by using the keyboard. Place a calibrated weight matching exactly the weight shown in the display on the weighing platform and wait a few seconds for the weight to stabilize. Press the key to begin the weight adjustment. The display will show lines of hyphens while the adjustment is being done. This process will last for a few seconds.

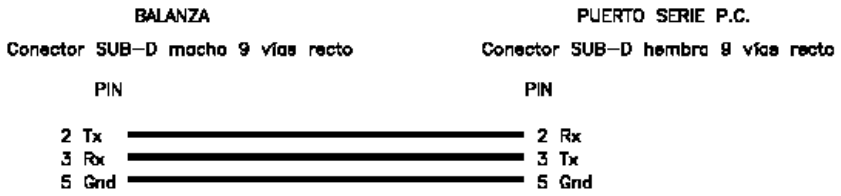


Once the adjustment process has been completed correctly, the scale will return to test ready automatically. If an error occurs during the adjustment, the scale will show a message “Error ”. Press the key to return to test ready and retry the adjustment process.

3 COMMUNICATIONS

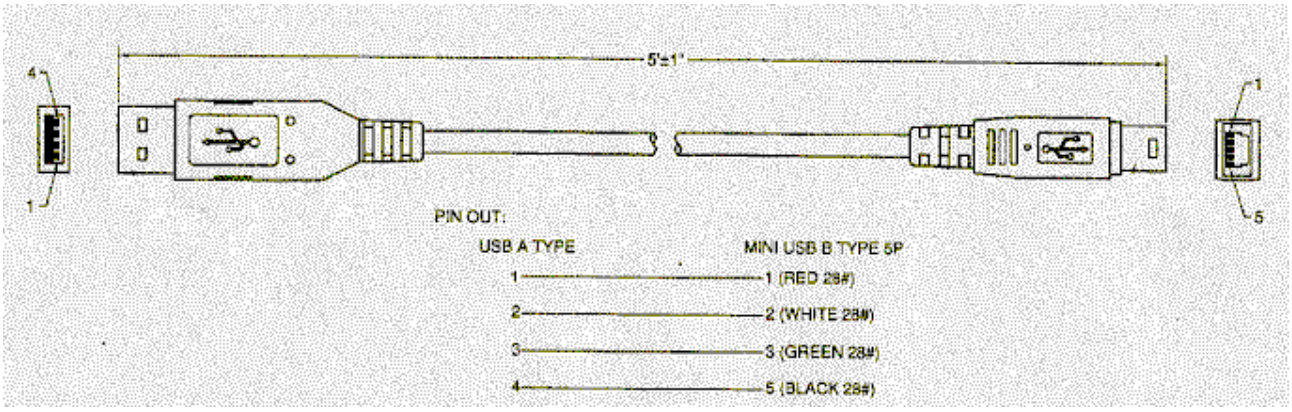
Model **DPOS400** is capable of communicating with a computer.





The reference of the cable is BV-5858.

The scale DPOS400 is capable of communicating with a computer by USB. Is a standard cable with an A connector on one end and a mini-B connector on the other end.



Never use a communications cable different to the one shown above.

3.1 COMMUNICATION PARAMETERS

The communications are going to be programmed in this menu. It is necessary select the parirty, the data transfer rate, the bits numbers…

Hold the key →0← until the next screen will appear. If you keep pressed a lot of time this key, the scale will switch off.

Select the type of communication in accordance with the table below:

Type	Bauds	Data Bits	Stop Bits	Parity
0	9600	8	1	No
1	9600	8	1	Even
2	9600	8	1	Odd
3	9600	8	2	No
4	9600	7	1	Even
5	9600	7	1	Odd
6	9600	7	2	Even
7	9600	7	2	Odd
8	19200	8	1	No
9	19200	8	1	Even
10	19200	8	1	Odd
11	19200	8	2	No
12	19200	7	1	Even
13	19200	7	1	Odd
14	19200	7	2	Even
15	19200	7	2	Odd
16	4800	8	1	No
17	4800	8	1	Even
18	4800	8	1	Odd
19	4800	8	2	No

Type	Bauds	Data Bits	Stop Bits	Parity
20	4800	7	1	Even
21	4800	7	1	Odd
22	4800	7	2	Even
23	4800	7	2	Odd
24	2400	8	1	No
25	2400	8	1	Even
26	2400	8	1	Odd
27	2400	8	2	No
28	2400	7	1	Even
29	2400	7	1	Odd
30	2400	7	2	Even
31	2400	7	2	Odd
32	1200	8	1	No
33	1200	8	1	Even
34	1200	8	1	Odd
35	1200	8	2	No
36	1200	7	1	Even
37	1200	7	1	Odd
38	1200	7	2	Even
39	1200	7	2	Odd

Press the key →T← to increase the programming value

Press the key →0← to decrease the programming value

Press the key →TP← to program the next field.

3.2 PROTOCOL SELECTION

In this menu you select one of the available protocols. Using this protocol the scale is able to communicate with a POS or a cash register.

The following protocols are available:

Código	Protocolo	Código	Protocolo
1	ANKER	26	-------
2	TPV CASIO	27	DATECS
3	RIVA / UNIWELL	28	TPV CASIO NUEVO
4	TISA	29	-------
5	EAN a PC ICL	30	DIALOG 06 sin atender al peso mínimo
6	SANYO	31	ELZAB
7	APOLLO/SAMSUNG POLONIA	32	TOWA
8	DELTA	33	SHARP UP-700-2
9	ALFA	34	QT-6000
10	DOLAR/SAMSUNG ESPAÑA	35	OLIVETTI
11	SAMSUNG PORTUGAL	36	TF-1000
12	UNIPROX (BMC PS-2000)	37	SHARP UP-800
13	UNIPROX con checksum	38	IBM
14	SHARP UP-700	39	DIALOG 06 sin atender a la tara recibida
15	KABEL (ITALIA)	40	DIALOG 06 sin atender a peso mínimo ni a la tara recibida
16	NCI	41	-------
17	ECR-POSNET	42	DIBAL Terminal
18	TISA con envío en peso estable	43	IBM/HUGIN "SERD" para cajas CHD 3010
19	VD TISA	44	ANKER con envío de peso cero
20	VD SEUR	45	COM (DATECS 2)
21	UNIPROX con 6 dígitos de precio	46	SAMSUNG CHINA
22	STAR (con envío en peso estable)	47	HUNAN WEIBOSHI
23	--------	48	METTLER (PRECIA)
24	Checkout_Dialog06	49	CARREFOUR
25	EUROSTAR 2000T ALPHA	50	DIALOG 02/04

Press the key → T to increase the programming value

Press the key → 0 ← to decrease the programming value

Press the key → TF to program the next field.

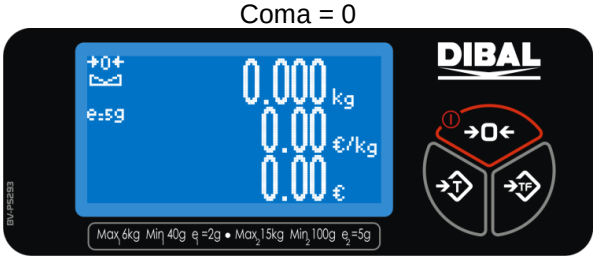
3.3 POINT/COMA CONFIGURATION

In this menu you can switch the decimal point that separates the whole number and decimal part of price, weight and amount. The default value is 0, which represents the decimal point as a point. Press the key or to modify this value.

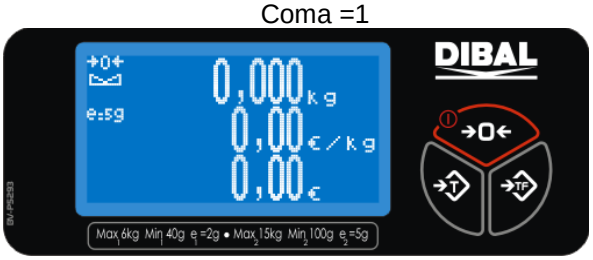
.

On the following pictures you can view the different representations.

Coma = 0



Coma =1



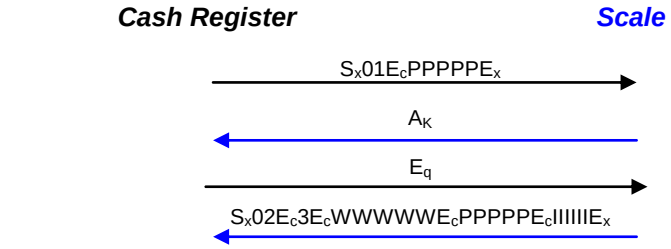
Pulse la tecla para volver a la pantalla principal.

4 PROTOCOLS TYPE

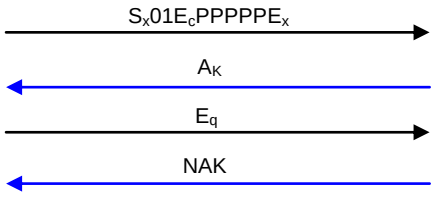
In this section the protocols are going to be described. To select one of them, go to section 3.2 Protocol selection.

4.1 ANKER cash register protocol

Protocol



If the weight is unstable, zero, negative or out of range:



Where:

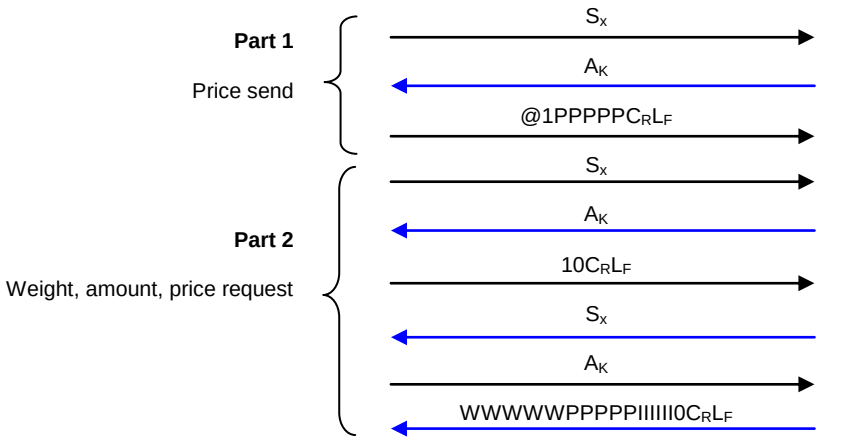
S_x:	0x02h	**A_K:**	0x06h
01:	0x30h y 0x31h	**E_x:**	0x03h
E_c:	0x1Bh	**NAK:**	0x15h
WWWWW:	5 characters for weight.		
PPPPP:	5 characters for price.		
IIIIII:	6 characters for amount.		

NOTE:

- After the scale responds with **A_K** wait for a second to receive **E_q**, if this time expired the scale do not respond to **E_q**.
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale responds with **NAK.**
- If the weight is unstable, zero, negative or erroneous (with "-------" on the display), the scale respond with **NAK**.
- If the amount overflows the scale send 000000 in the field **IIIIII**.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.2 TPV CASIO CE protocol

Protocol



Where:

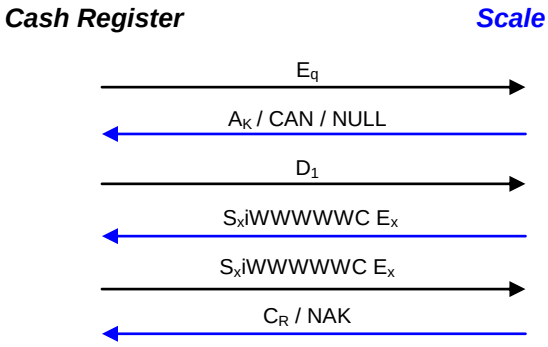
S_x:	0x02h	**A_K:**	0x06h
@1:	0x40h y 0x31h	**L_F:**	0x0Ah
10:	0x31h y 0x30h	**NAK:**	0x15h
C_R:	0x0Dh		
WWWWW:	5 characters for weight.		
PPPPP:	5 characters for price.		
IIIIII:	6 characters for amount.		

NOTE:

- The protocol contains two parts; on the first one the article weight is sent. On the second one weight, price and amount calculated by the scale is requested.
- If the weight is unstable, negative or erroneous; the scale wait until it has stable positive within range weight to send weight, price and amount.
- If the weight, price or amount is zero when a request is made, the scale responds with **00000PPPPP000000 $C_R L_F$**. The price field is substituted by the sent price.
- If the amount overflows the scale send 000000 on the amount field.
- 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 **0000000000000000 $C_R L_F$.**
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.
- If the scale detects some error on the format or on the frame of send sequence it responds with **NAK**.

4.3 RIVA / UNIWELL cash register protocol

Protocol



Where:

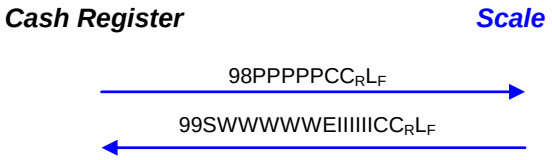
E_q:	0x05h	**A_K:**	0x06h
D_1:	0x11h	**S_x:**	0x02h
i:	0x69h	**C_R:**	0x0Dh
WWWWW:	5 characters for weight.		
C:	Checksum, logic add (XOR) starting from **i**.		
E_x:	0x03h		
NAK:	0x15h		
CAN:	0x18h		
NULL:	0x00h		

NOTE:

- If when **E_q** is received the weight is unstable the scale responds with **NULL**.
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale responds with **CAN** to **E_q.**
- After the scale responds to **A_K** and **S_xiWWWWWCE$_x$** there is timeout to receive the frames **D1** and **S_xiWWWWWCE$_x$**. If this time expired the scale responds with **NAK** in both case
- If the weight is unstable, zero, negative or erroneous (with "-------" on the display), the scale responds with 00000 weight and **NAK** after the frame **S_xiWWWWWC E_x.**
- If the received weight frame do not match with the send weight frame, the scale responds with **NAK** instead **CR**.
- To the capacity of 6kg-2g the scale use the character k instead the character i.
- To the capacity of 6kg-2g a **NULL** (0x00h) is sent instead the first character of the weight **W**.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.4 TISA cash register protocol

Protocol



Where:

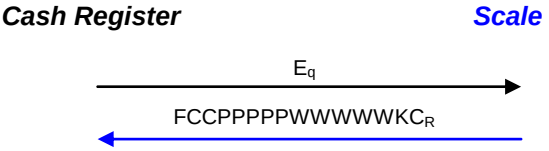
98:	0x38h y 0x39h
PPPPP:	5 characters for price.
C:	Checksum, logic add (XOR) of all previous characters.
C_R:	0x0Dh **L_F:** 0x0Ah
99:	0x39h y 0x39h
S:	Weight status. 0: 0x30h Correct. 1: 0x31h Error.
WWWWW:	5 characters for weight.
E:	Amount status. 0: 0x30h Correct. 1: 0x31h Error.
IIIIII:	6 characters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

4.5 EAN to PC ICL cash register protocol

Protocol



Where:

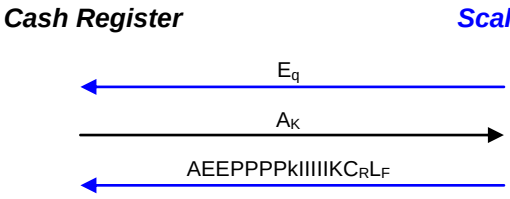
E_q:	0x05h
F:	0x46h
CC:	0x35h y 0x35h On scale configurable headers of barcode
PPPPP:	5 characters for price.
WWWWW:	5 characters for weight.
K:	Checksum.
C_R:	0x0Dh

NOTE:

- The checksum K is calculated from F (excluding this) adding the characters of odd position (multiplied by 3) and the sum of the characters of even positions. Taking the module 10 of this sum and making the complement to 10. For example, if the sum of all characters is 23, you only take the 3 and then subtract 3 to ten (10-3). This value (7) will be the checksum.
- If on the scale introduced weight has more than 5 digits, the scale does not respond to **ENQ.**
- The scale waits until it has stable positive weight to responds to **ENQ**.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.6 SANYO cash register protocol

Protocol



Where:

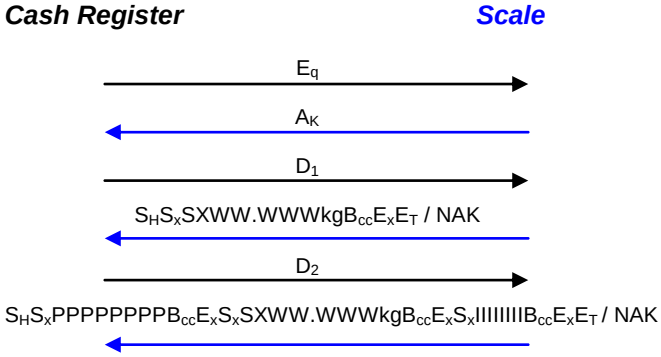
E_q:	0x05h	**A_K:**	0x06h
A :	0_x41h		
EE:	Two characters of headers of configurable codebar. (Menu 0790 of test and adjustment).		
PPPP:	4 character for price.		
k :	Partial checksum of the first 7 characters sent.		
IIIII :	5 character for amount.		
K:	Total checksum of the 13 characters sent.		
C_R :	0_x0Dh		
L_F :	0x0Ah		

NOTE:

- The scale always sends an **E_q** when the key is pressed.
- If there is not any price programmed, the Scale responds with the price and amount to zero.
- The Scale after sending **E_q** has a timeout to receive the **A_K**. If this time expires, makes a new attempt of sending **E_q** to a total of 10 times.
- The checksum is calculated by the XOR of the indicated characters.
- The Scale waits until it has stable within range weight to send the message
- If the number of price characters is exceeded the scales responds with price and amount to zero.
- If the amount exceeds 5 digit, the scale responds with price and amount to zero.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1 the scale sends 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 price and amount to zero**.**

4.7 APOLLO / SAMSUNG POLONIA cash register protocol

Protocol



Where:

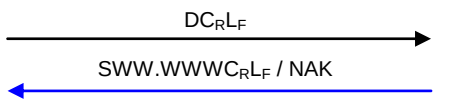
E_q:	0x05h	**A_K:**	0x06h
D_1:	0x11h	**D_2:**	0x12h
S_H:	0x01h	**S_X:**	0x02h
S:	Weight status.		
S:	0x53h stable.		
	U: 0x55h Unstable.		
X:	0x20h, 0x46h, 0x2Dh		
PPPPPPPP:	8 characters for price (the first 2 to 0).		
WWWWW:	5 characters for weight.		
IIIIIIII:	8 characters for amount (the first 2 to 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:
  - ' ' (0x20): when the weight is valid.
  - 'F' (0x46): when the weight is erroneous or invalid.
  - '–' (0x2D): when the weight is negative (for example: Tare without plate).
- The **S** can take the values:
  - 'S' (0x53): when the weight is stable.
  - 'U' (0x55): when the weight is unstable.
- If the weight is unstable momentary value is sent in the field **WW.WWW.** For the answer **D_2**, 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 FFFFFFF. 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 **D_2** 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

4.8 DELTA cash register protocol

Protocol



Where:

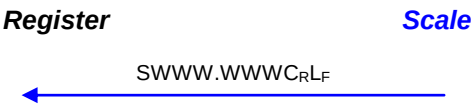
D:	0x44h
C_R:	0x0Dh
L_F:	0x0Ah
S:	Weight sign
	+: 0x2Bh
	-: 0x2Dh
WWWWW:	5 characters for weight.
.:	0x2Eh

NOTE:

- The scale does not respond until it has stable within range weight
- The scale cannot answer with positive and negative weight.
- If received frame format is incorrect, the scale responds with **NAK**.
- The scale sends a blank space after the sign **S**. Then sends another blank space if the digit corresponding to weight is zero (if the digit is not a zero sends that digit).
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.9 ALFA cash register protocol

Protocol



Where:

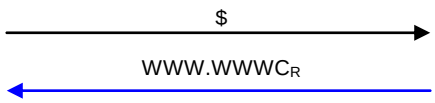
S:	Sign.
	+: 0x2Bh **-:** 0x2Dh
WWWWWW:	6 characters for weight.
.:	0x2Eh
C_R:	0x0Dh **L_F:** 0x0Ah

NOTE:

- The scale sends the data when the key is pressed.
- The scale sends positive or negative, stable weights within range. If they are unstable or out of range, the scale wait until it has stable within range weight.
- After the sign S is sent a zero on the frame sent by the scale. The first digit of the weight is set to zero.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.10 SAMSUNG-SPAIN cash register protocol

Protocol



Where:

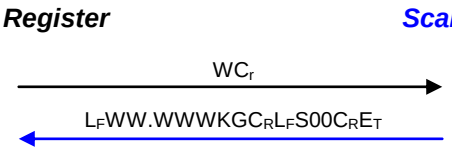
$:	0x24h	
WWWWWW :	6 weight characters	
. :	0x2Eh	**C_R :**0x0Dh

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 **WWWWW**.

4.11 SAMSUNG PORTUGAL cash register protocol

Protocol



Where:

W:	0X57H, weight request.
C_R:	0x0Dh
L_F:	0x0Ah
WWWWW:	5 characters for weight.
.:	0x2E decimal point.
S:	0x53h Weight status.
00:	0x30h, 0x30h If weight status is correct. This parameter can take different values: **00**: Stable within range [0 - 15.045] **11**: Unstable weight, overload or negative weight. If the weight is unstable, **WW.WWW** takes the momentary weight. If the weight is negative or higher than the max (+ 9e), the **WW.WWW** value will be 00,000.
KG:	0x4Bh y 0x47h
E_{TX}:	0x03h

NOTE:

- With negative weight or out of range the scale always responds 00.000kg.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.12 UNIPROX / BMC PS 2000 cash register protocol

Protocol

Cash Register ***Scale***

EEPPPP0WWWWW0$C_R$$L_F$

Where:

EE :	Two header characters of configurable bar code.		
0:	0x30h		
PPPP :	PLU coder	**C_R:**	0x0Dh
WWWWW :	5 weight characters	**L_F:**	0x0Ah

NOTE:

- This is not WEIGHT-PRICE-AMOUNT protocol, it is a WEGHT-PLU CODE protocol. So the keys that in other protocols are used to introduce the price and calculate the amount in this protocol are used to select the PLU code which will send to cash register. The amount line is this protocol is annulated.
- The scale sends the data to cash register when the key is pressed.
- If the PLU CODE is higher than 9999, the scales sends 0000 instead the PLU CODE
- The momentary weight will send if the weight is unstable when the total key is pressed.
- If the weight is negative or unstable (with "-------" on the display) the scale sends the field **WWWWW** with zeros.

4.13 UNIPROX cash register protocol with CHECKSUM

Protocol

Cash Register ***Scale***

EEPPPPCWWWWWkC$_R$L$_F$

Where:

EE :	Two header characters of configurable bar code.		
PPPP :	PLU Code		
C :	Partial checksum		
WWWWW :	5 weight characters	**L_F:**	0x0Ah
K :	Total checksum	**C_R :**	0x0Dh

NOTE:

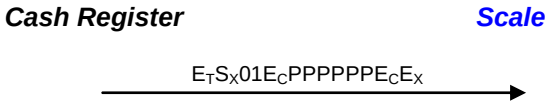
- This is not WEIGHT-PRICE-AMOUNT protocol, it is a WEGHT-PLU CODE protocol. So the keys that in other protocols are used to introduce the price and calculate the amount in this protocol are used to select the PLU code which will send to cash register. The amount line is this protocol is annulated.
- The scale sends the data to cash register when the key is pressed.
- If the PLU CODE is higher than 9999, the scales sends 0000 instead the PLU CODE
- The momentary weight will send if the weight is unstable when the total key is pressed.
- If the weight is negative or unstable (with "-------" on the display) the scale sends the field **WWWWW** with zeros.
- The total checksum is calculated adding the characters of odd position (multiplied by 3) and the sum of the characters of even positions. Taking the module 10 of this sum and making the tens complement. For example, if the sum of all characters is 23, you only take the 3 and then subtract 3 to ten (10-3). This value (7) will be the checksum.
- The partial checksum is calculated assigning weights according to some tables.

4.14 SHARP UP-700 cash register protocol

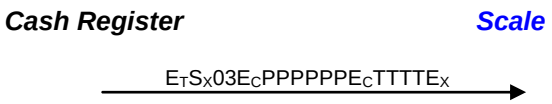
Protocol

It can be send 4 different frames.

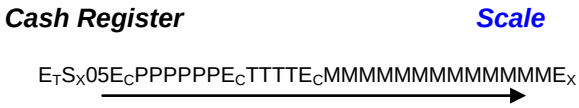
Frame 1



Frame 2

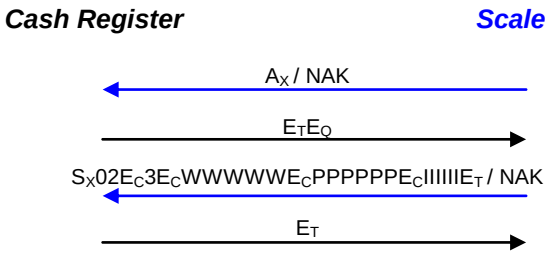


Frame 3

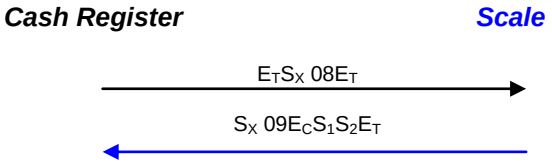


Frame 4

From the 4 different frames the protocol functions 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			
E_C:	0x1Bh			
E_Q:	0x05h			
	0:	0x30h	**1:**	0x31h
	2:	0x32h	**3:**	0x33h

WWWWW: 5 characters for weight

PPPPPP: 6 characters for price

IIIIII: 6 characters for amount

TTTT: 4 characters for TARE associated to PLU

MMMMMMMMMMMM: 13 characters for PLU description that the scale ignores it.

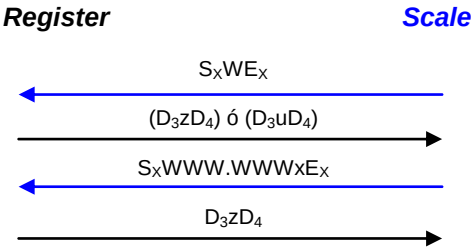
S_1 S_2 :	Status
0 0 :	No error.
0 1 :	Scale general error. Zero error, adjustment fail, start-up error.
0 2 :	Parity error or more characters than available.
1 0 :	Frame number incorrect (numeric field on header).
1 1 :	Base price not valid.
1 2 :	Tare value not allowed.
2 0 :	The scale has not stabilized the weight.
2 1 :	The weight does not vary from last operation.
2 2 :	Overflow. 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:

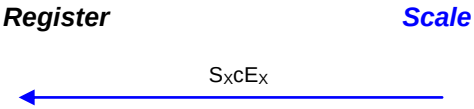
- This is not a protocol for only weight scales.
- If there is a status error, parity error, frame number error, base price not valid, not allowed tare, negative or zero weight the scale responds with **NAK** to frames 1,2,3 or 4.
- If there is a status error, parity error, frame number error, base price not valid, not allowed tare, negative or zero weight the scale responds with **NAK** to frame ($\mathbf{E_T E_Q}$).
- If you set a tare the weight displayed and the sent weight is the net weight.
- 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. Furthermore, the status gets the value 30.
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale responds with **NAK**, setting the status to 21.

4.15 KABEL cash register protocol

Protocol



Weight cancellation frame



Where:

S_X:	0x02h	**z:**	0x7Ah
E_X:	0x03h	**u:**	0x75h
D_3:	0x13h	**W:**	0x57h
D_4:	0x14h	**WWW.WWW:**	6 characters for weight
c:	0x63h		

NOTE:

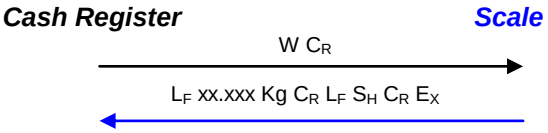
- The scale sends the weight when the total key is pressed.
- If you want to cancel a sent weight it is possible pressing one key (undefined) on the scale. The scale will send a cancellation command. This is the same command (0x63) that the cash register sends when the key C is pressed.
- Once the scale sends the frame **S_XWE_X** , a timeout of 500 milliseconds is set to receive **D3zD4** or **D3uD4**. If this timeout expire the scale does not send the weight.
- If the weight is out of range, the scale will not send the weight frame.
- If the weight is unstable or negative, the scale waits until it has stable and positive weight.

Contact with the technical support department for more information.

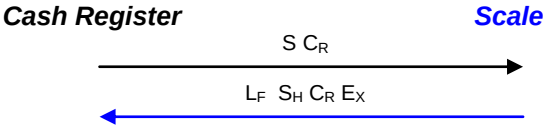
4.16 NCi cash register protocol

Protocol

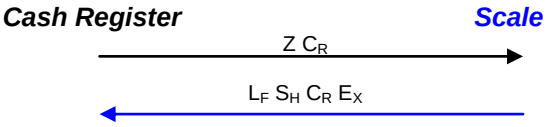
1) Weight request



2) Status request

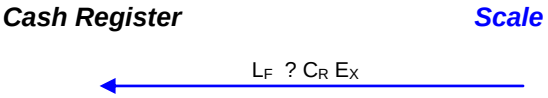


3) Scale autozero

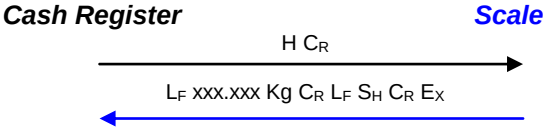


4) Command not recognized

If it is not sent one of the previous commands, the scale respond "Command not recognized".



5) High resolution weight request



Where:

W:	0x57h	**L_F:**	0x0Ah
S:	0x53h	**E_X:**	0x03h
Z:	0x5Ah	**S_H:**	0x01h
?:	0x3Fh		
xxxxx:	5 characters for weight (6 on high resolution multiplying the weight by 10)		
C_R:	0x0Dh	**Kg:**	0x4Bh y 0x47h
.:	0x2Eh decimal point		

NOTE:

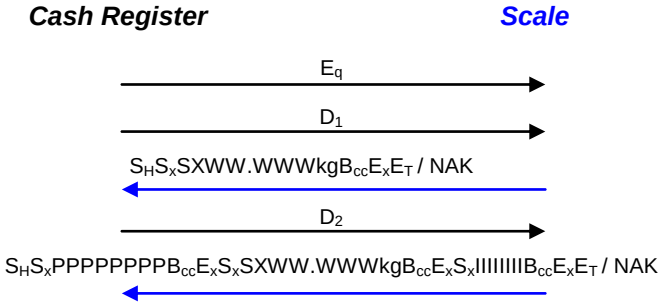
- If the weight is unstable, erroneous, negative or there is zero error, the scale responds to weight request frame (**WC_R**) and high resolution weight request frame (**HC_R**) with the status frame (not with the weight).
- When the scale responds with the status, it sends one of the following values:
  - 00: Correct.
  - 01: Negative weight.
  - 02: Erroneous weight.
  - 08: Zero error.
  - 10: Unstable weight.
  - 20: Zero weight.

  If two of the different situations happens simultaneously, it is sent a logic OR of the numeric values. For example, if the weight is negative (01) and unstable (10) it is send the value 11.

- When **ZC_R** is sent and the weight is unstable, erroneous, there is a tare or zero error, the autozero is not made.

4.17 ECR-POSNET protocol (SAMSUNG POLAND variant)

Protocol



Where:

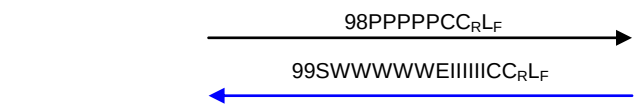
E_q:	0x05h		
D_1:	0x11h	**D_2:**	0x12h
S_H:	0x01h	**S_X:**	0x02h
S:	Weight status.		
	S: 0x53h	stable.	
	U: 0x55h	Unstable.	
X:			
	SPACE: 0x20h		
	U: 0X46h		
	– : 0x2Dh		
PPPPPPPP:	8 characters for price (the first two to zero).		
WWWWW:	5 characters for weight.		
IIIIIIII:	8 characters for amount (the 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 **FFFFFFF**. In the answer to the frame **D_2** , 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 **D_2** 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.

4.18 TISA protocol (with stable weight send)

Protocol



Where:

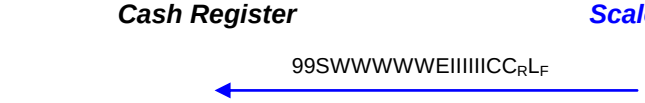
98:	0x38h y 0x39h		
PPPPP:	5 characters for price.		
C:	Checksum, logic add (XOR) of all previous characters.		
C_R:	0x0Dh	**L_F:**	0x0Ah
99:	0x39h y 0x39h		
S:	Weight status. S: 0x30h Correct. S: 0x31h Error.		
WWWWW:	5 digits for weight.		
E:	Amount status. E: 0x30h Correct. E: 0x31h Error.		
IIIIII:	6 characters for amount.		

NOTE:

- Once the scale receives the price, it sends the data when the weight is stable, non-negative and correct.
- If the amount overflows the scale sends 00000 on the amount field.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1 the scale will send the field S as 1 with the weight 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 will send with the field S as 1 with the weight
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.19 VD TISA protocol

Protocol



Where:

98:	0x38h y 0x39h		
C:	Checksum, logic add (XOR) of all previous characters.		
C_R:	0x0Dh	**L_F:**	0x0Ah
S:	weight status. S: 0x30h Correct. S: 0x31h Error.		
WWWWW:	5 digits for weight.		
E:	Weight status. E: 0x30h Correct. E: 0x31h Error.		
IIIIII:	6 characters for amount.		

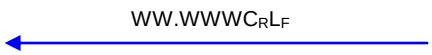
NOTE:

- The scale sends the data when the weight is stable, non-negative, higher than 0 and correct
- If the amount overflows, the scale wait until the value is on range to send the message.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1 the scale will send the field S as 1 with the weight 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 will send with the field S as 1 with the weight
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.20 VD SEUR protocol

Protocol

Cash Register ***Scale***



Where:

C_R:	0x0Dh	**L_F:**	0x0Ah
WWWWW:	5 characters for weight.		
.:	0x2Eh		

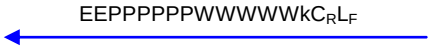
NOTE:

- The scale sends the data when the weight is stable, non-negative, higher than 0 and correct
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.21 UNIPROX Protocol (with 6 digits for price)

Protocol

Cash Register ***Scale***



Where:

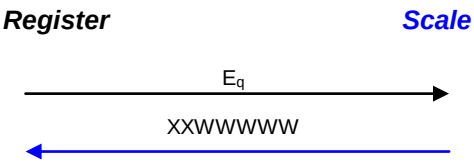
EE :	Two header characters of configurable bar code.		
PPPPPP :	6 price characters		
WWWWW :	5 weight characters	**L_F:**	0x0Ah
K :	Global checksum	**C_R :**	0x0Dh

NOTE:

- The scale sends the data to cash register when the key is pressed.
- The weights higher than capacity or negative (with "-------" on the display) are send as 00000.
- The negative weights are sent as 00000.
- The momentary weight is sent when the weight is unstable.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.
- The **K** checksum is calculated adding the characters of odd position (multiplied by 3) and the sum of the characters of even positions. Taking the module 10 of this sum and making the tens complement. For example, if the sum of all characters is 23, you only take the 3 and then subtract 3 to ten (10-3). This value (7) will be the checksum.

4.22 STAR protocol (with stable weight send)

Protocol



Where:

WWWWW:	5 characters for weight.
X:	0x20h

NOTE:

- The X represents a blank space.
- The weight is only sent if it is stable within range or zero
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.
- The frame is not sent if the weight is negative or out of range.

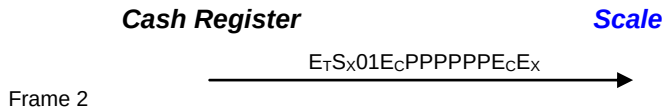
4.23 Reserved

4.24 DIALOG 06 Protocol

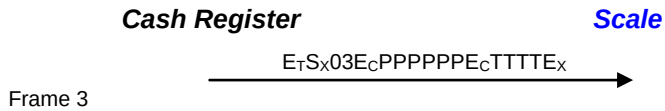
Protocol

There are four different frames.

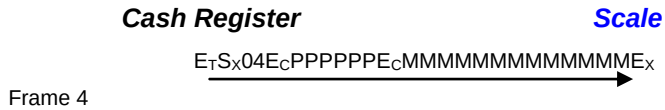
Frame 1



Frame 2

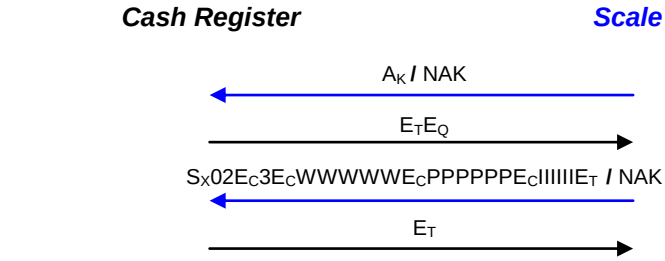


Frame 3

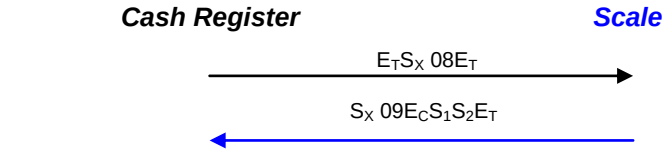


Frame 4

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

IIIIII: 6 characters for amount

TTTT: 4 digits for the PLU tare

MMMMMMMMMMMMM: 13 digits for the PLU description (ignored by the scale)

$S_1 S_2$:	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 opartion.
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

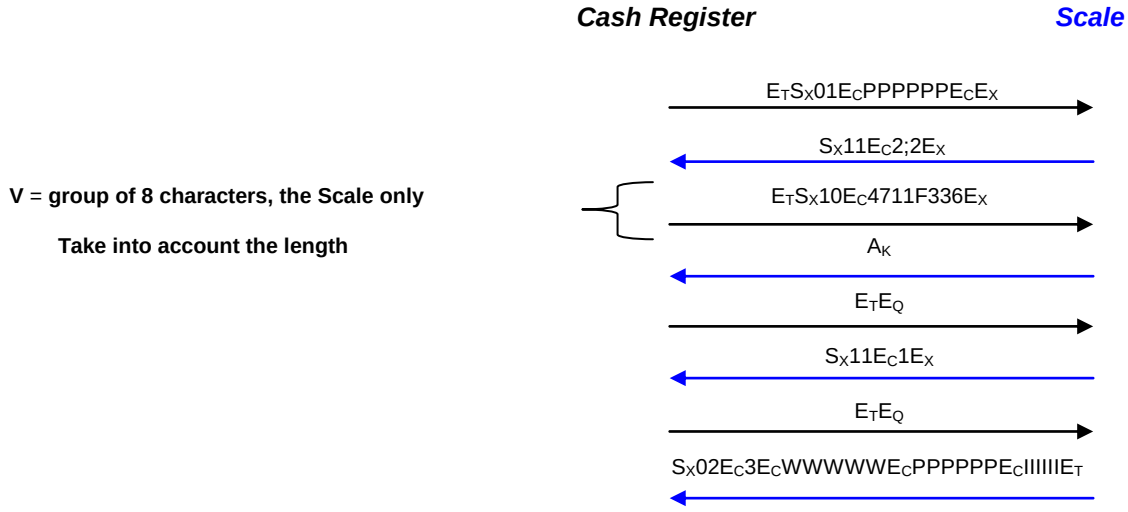
And the scale responds

S_X02… with the corresponding data

or

NAK if it has been an error.

Synchronization example:
- 1 kilo on the scale



V = **group of 8 characters, the Scale only**

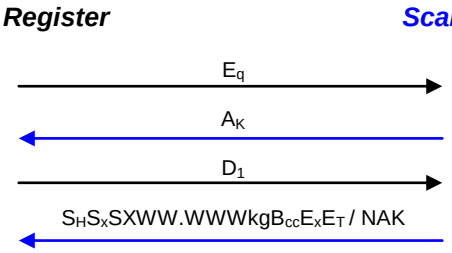
Take into account the length

- When the scale detects an error for one of the following reasons, it responds with **NAK** to frames 1, 2, 3, o 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

4.25 EUROSTAR 2000T ALPHA Protocol (LITHUANIA)

Protocol



Where:

E_q:	0x05h	**A_K:**	0x06h
D_1:	0x11h		
S_H:	0x01h	**S_X:**	0x02h
S:	Weight status.		
	S: 0x53h	Stable.	
	U: 0x55h	Unstable.	
X:	0x20h		
WWWWW:	5 characters for weight.		
.:	0x2Eh		
kg:	0x6Bh y 0x67h		
B_{cc}:	Checksum, logic add (XOR) from S to weight.		
E_x:	0x03h		
E_T:	0x04h		

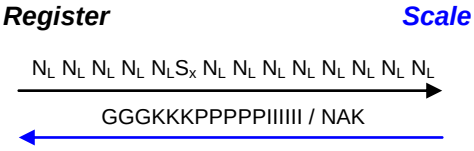
NOTE:

- The X represents a blank space (0x20h).
- If the weight is unstable the scale sends the momentary weight and set the field **S** to **U.**
- If the frame **E_q** or **D_1** is not received on appropriated time, the scale responds with **NAK** and restarts the communication.
- The scale sends the weight frame to zero if the weight is negative or out of range.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.26 Reserved

4.27 DATECS Protocol

Protocol



Where:

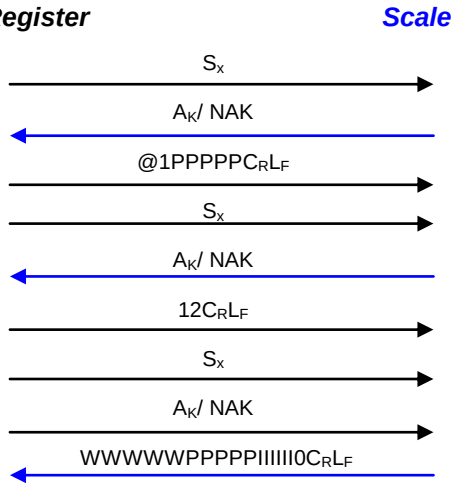
N_L**:**	0x00h	S_X**:**	0x02h
GGG:	3 characters for grams.		
KKK:	3 characters for kilo.		
PPPPP:	5 characters for price.		
IIIIII:	6 characters for amount.		

NOTE:

- The scale always sends to zero (0x30) the field price and amount.
- The scale responds with **NAK** (and restart the communication) when there is an incorrect character on a frame.
- The scale sends the data of the frame **GGGKKK** from right to left (LSB→MSB). For example, the weight 5,492 Kg is sent as 294500.
- The scale sends the weight frame to zero if the weight is negative or overflows.
- If the weight is unstable the scale sends the momentary weight.
- If the scale has a tare weight, it sends the net weight.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1, the scale will not respond 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 will not respond.

4.28 New CASIO TPV Protocol

Protocol



Where:

S_x:	0x02h	**A_K:**	0x06h
@1:	0x40h y 0x31h	**10:**	0x31h y 0x30h
C_R:	0x0Dh	**L_F:**	0x0Ah
WWWWW:	5 characters for weight.		
PPPPP:	5 characters for price.		
IIIIII:	6 characters for amount		

NOTE:

- If the weight is negative, unstable or erroneous (with "-------" on the display) the scale responds to every frames with **NAK**.
- If the weight is unstable when the cash register request weight, price and amount, the Scale waits until it has stable weight to send the message
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1, the scale will respond 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 will respond with the frame **0000000000000000 C_RL_F**.
- If the amount overflows the scale sends the frame **0000000000000000 C_RL_F**
- If the scale detects an error in the format or in the send sequence, it responds with **NAK.**
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

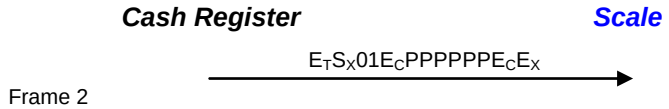
4.29 Reserved

4.30 DIALOG 06 protocol without attend to minimum weight

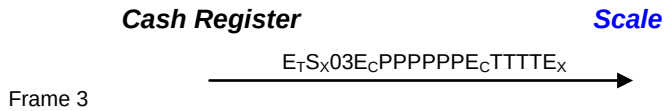
Protocol

There are four different frames.

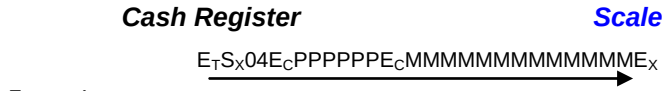
Frame 1



Frame 2

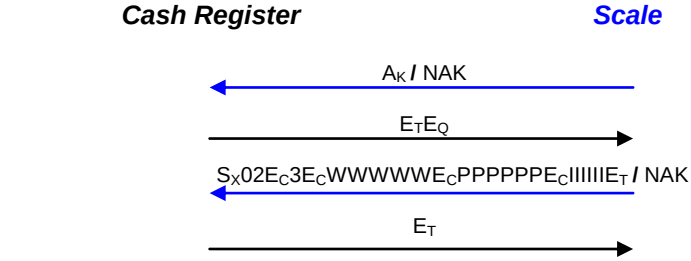


Frame 3

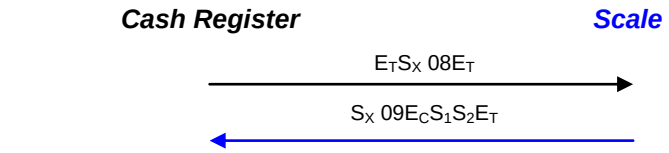


Frame 4

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:



Donde:

E_T:	0x04h		
S_x:	0x02h		
A_K:	0x06h		
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
IIIIII:	6 characters for amount
TTTT:	4 digits for the PLU tare

S_1 S_2 :	Status

0 0 :	Correct.
0 1 :	General error. Start-up error, adjustment error…
0 2 :	Parity error or more than available characters. IT 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:

- The different between this protocol and the DIALOG 06 (protocol number 24) is that this protocol not considers the minimum weight as error. So this protocol sends the weight although it will be lower than 20e.
- 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

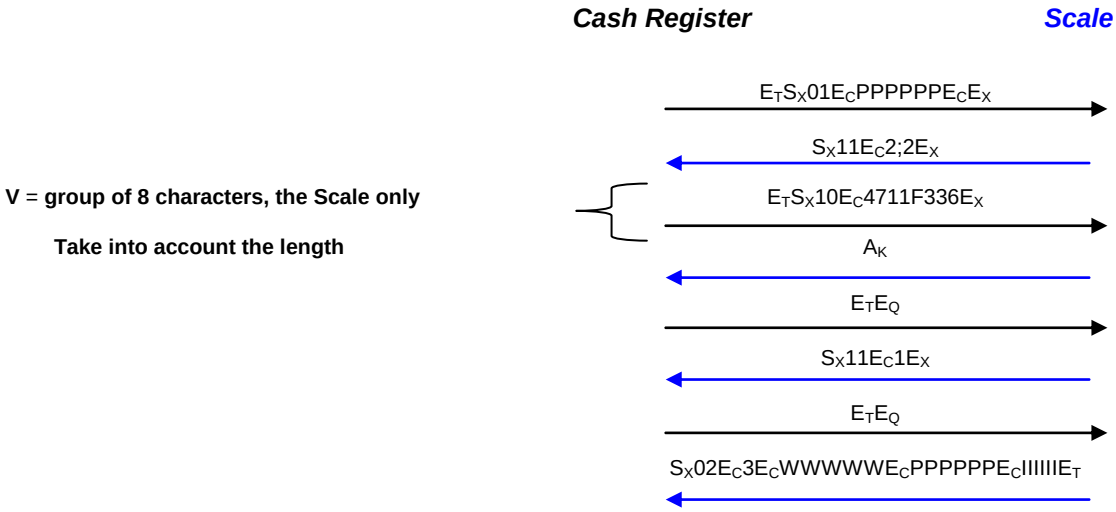
  And the scale responds

  S_X02… with the corresponding data

  or

  NAK if it has been an error.

Synchronization example:
- 1 kilo on the scale



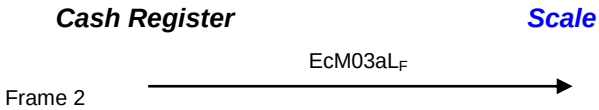
- When the scale detects an error for one of the following reasons, it responds with **NAK** to frames 1, 2, 3, o 4 :
    - Be in error status
    - Parity error
    - Received frame erroneous
    - Base price not valid
    - The tare is not valid
    - Negative weight
- When the scale detects an error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

4.31 ELZAB protocol

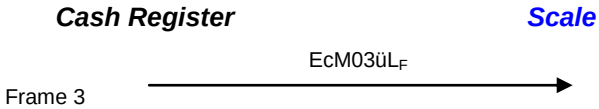
Protocol

There are six different frames.

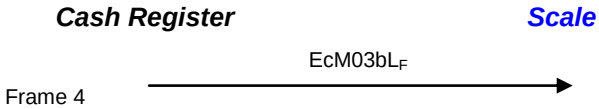
Frame 1



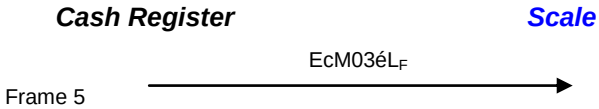
Frame 2



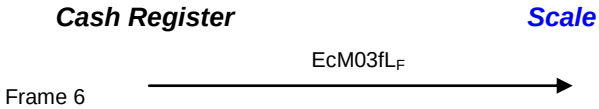
Frame 3



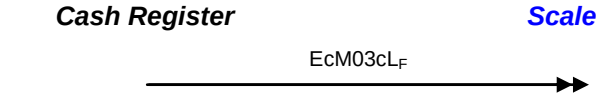
Frame 4



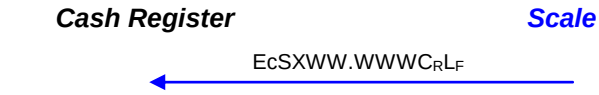
Frame 5



Frame 6



From the first 4 frames the protocol function as follows



Always responds with 0x1Ch the frame 5

The scale does not respond to the frame 5, it only restarts the communication.

Where:

E_C:	0x1Bh	**M:**	0x4Dh	**FS:**	0x1Ch
03:	0x30h y 0x33h	**a:**	0x61h		
ü:	0x81h	**b:**	0x20h		
é:	0x82h	**f:**	0X66h		

WWWWW:	5 characters for weight
.:	0x2Eh
S:	Weight status. S: 0x53h Stable. U: 0x55h Unstable.
C_R:	0x0Dh
L_F:	0x0Ah
X:	Weight sign **S**pace: 0x20h Positive -: 0x2Dh Negative

NOTE:

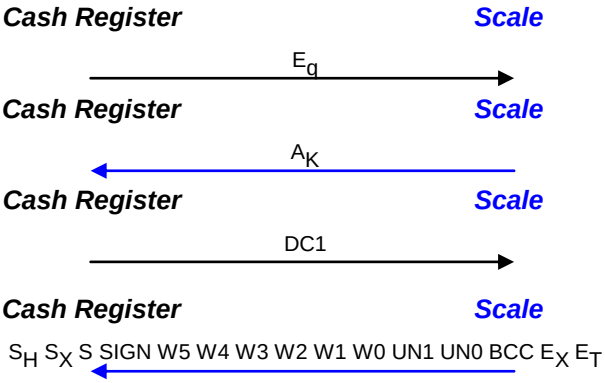
- When the scale receives the frame 1 or 2 and the weight is unstable, there is a timeout of 7 seconds. When this timeout expires the scale sends the weight, if the weight continues being unstable, the scale set the field S to U.
- The frames 3 and 4 are responded immediately, without taking into account the status of the weight.
- With negative weight (with "---------" on display) the scale respond with -00.000.
- With overload (with "---------" on display) the scale respond with 00.000.
- If the scale has a tare weight, it sends the net weight.
- If the weight is unstable the scale sends the weight fill of blank spaces
- You must configure the communications with 8 bits instead 7, because this protocol sends ü (0x81) y é (0x82) characters.

4.32 TOWA Protocol

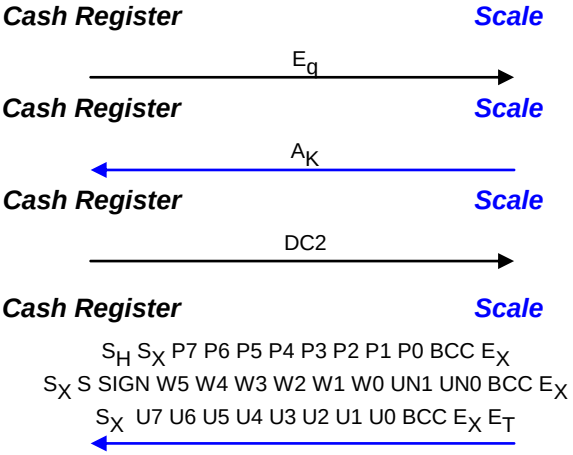
Protocol

1.Command mode:
There are three different formats depending on the command send by the cash register:

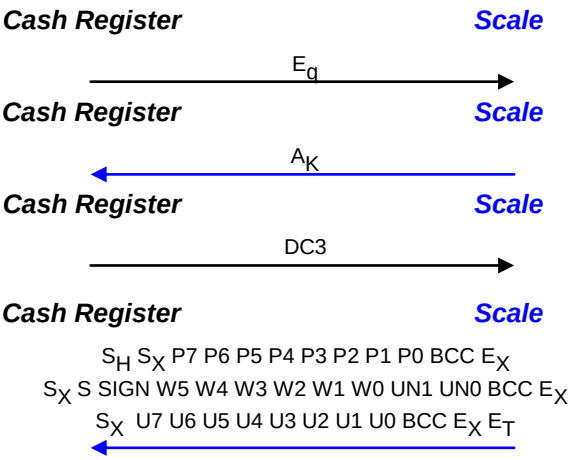
FORMAT 1



FORMAT 2



FORMAT 3



Note:

- On the format 3 the scale transmit the data continuously every second

2.Key trigger mode:

When you press the key

Cash Register	*Scale*

S_X 41h 32h M4 M3 M2 M1 M0 P5 P4 P3 P2 P1 P0 C E_X

When you press some keys (undefined)

Cash Register	*Scale*

S_H S_X P7 P6 P5 P4 P3 P2 P1 P0 BCC E_X
S_X S SIGN W5 W4 W3 W2 W1 W0 UN1 UN0 BCC E_X
S_X U7 U6 U5 U4 U3 U2 U1 U0 BCC E_X E_T

Where:

S_H:	0x01h	**E_X**:	0x03
S_X:	0x02h	**E_T**:	0x04
E_q:	0x05h	**A_k**:	0x06h
S:	**stable**: 0x53h	**Unstable**:	0x55h
SIGN:	+: 0x20h	-:	0x2Dh
UN1:	g:0x20h		
UN0:	g:0x67h		
BCC:	exclusive value.		
C:	Checksum		

$M_4M_3M_2M_1M_0$: PLU number. It will be '99999' when PLU is not used.
$W_5W_4W_3W_2W_1W_0$:6 characters for weight.
$P_7P_6P_5P_4P_3P_2P_1P_0$: 8 characters for amount.
$U_7U_6U_5U_4U_3U_2U_1U_0$: 8 characters for price.

NOTE:

- If the weight is unstable, negative or there is an error, the scale sends the price to zero.
- When the scale is working with the format 3 and the weight returns to 0 the scale stops the transmission. If it is put some weight again on the scale, the scale transmits the data continuously afresh. On the contrary if there is not weight on the scale and it receives a **DC1** or **DC2** the scale give up transmitting.
- The field **Bcc** that the scale sends in answer to the frame DC1 is calculated as the logical add (XOR) of all characters since Sx.
- The scale sends 3 **Bcc** (one for amount, weight and price) on the answer to the frames **DC2**, **DC3** and when it is working in key trigger mode:
  - The amount **Bcc** is calculated since **Sx**. This checksum is calculated adding the characters of odd position (multiplied by 3) and the sum of the characters of even positions. Taking the module 10 of this sum and making the tens complement. For example, if the sum of all characters is 23, you only take the 3 and then subtract 3 to ten (10-3). This value (7) will be the checksum
  - The **Bcc** of price and weight is calculated as the logical add (XOR) since the character **Sx**.
- The scale sends a checksum (C) when is working in key trigger mode. This checksum as reference the character 0x041 and it is calculated adding the characters of odd position (multiplied by 3) and the sum of the characters of even positions. Taking the module 10 of this sum and making the tens complement. For example, if the sum of all characters is 23, you only take the 3 and then subtract 3 to ten (10-3). This value (7) will be the checksum
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1, the scale will not respond 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 will not respond.

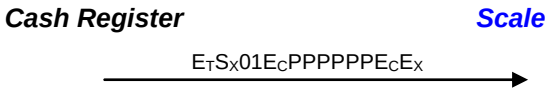
Contact with the technical support department for more information.

4.33 SHARP UP-700-2 cash register protocol

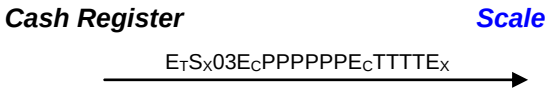
Protocol

There are five different frames.

Frame 1



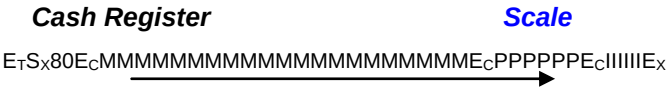
Frame 2



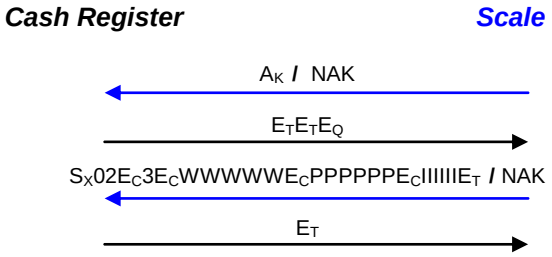
Frame 3

Frame 4

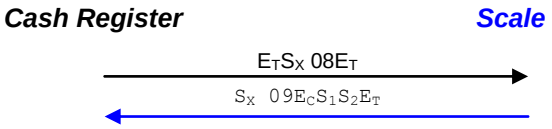
Frame 5



From the first 5 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		
E_C:	0x1Bh		
E_Q:	0x05h		
0:	0x30h	**1:**	0x31h
2:	0x32h	**3:**	0x33h
WWWWW:	5 characters for weight		
PPPPPP:	6 characters for price		
IIIIII:	6 characters for amount		
TTTT:	4 digits for the PLU tare		

MMMMMMMMMMMM: 13 digits for the PLU description that the scale ignores (21 characters on the frame 5).

S_1 S_2 :	Status
4 9 :	Without changes from the last operation.
ñ 7 :	General error.
ñ 6 :	Correct.

NOTE:

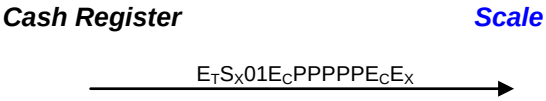
- If there is a parity error, frame number error, base price not valid, negative or zero weight or the scale is in error status, the scale responds with **NAK** to frames 1,2,3,4 or 5.
- If weight is unstable the scale responds with the momentary weight, received price and the amount to the frame $\mathbf{E_T E_T E_Q}$.
- If the amount overflows the scale responds to the frame $\mathbf{E_T E_T E_Q}$ with the amount to 0.
- If the scale has a tare weight, it sends the net weight.
- When the scale receives the frame 5 it responds with the same price and amount, it only add the weight.
- 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**.

4.34 QT-6000 cash register protocol

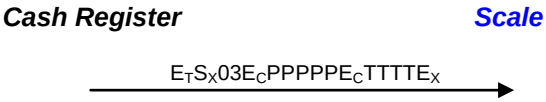
Protocol

There are four different frames.

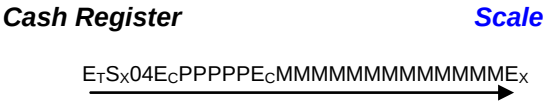
Frame 1



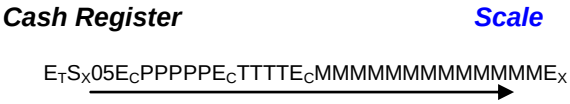
Frame 2



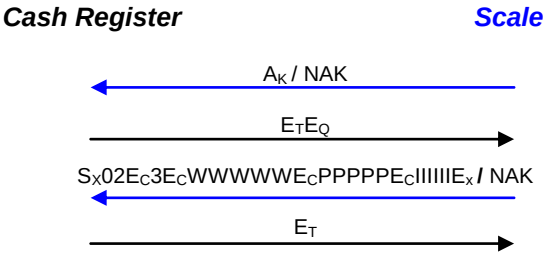
Frame 3



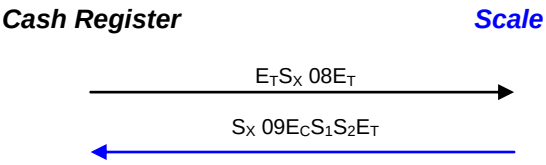
Frame 4



From the first 4 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	**Ex:**	0x03h
S_x:	0x02h	**NAK:**	0x15h
A_K:	0x06h		
E_C:	0x1Bh		
E_Q:	0x05h		
0:	0x30h	**1:**	0x31h
2:	0x32h	**3:**	0x33h
4:	0x34h	**5:**	0x35h

WWWWW:	5 characters for weight
PPPPP:	5 characters for price
IIIIII:	6 characters for amount
TTTT:	4 digits for the PLU tare
MMMMMMMMMMMMM:	13 digits for the PLU description that the scale ignores

S_1 S_2 :	Status
0 0 :	Correct.
0 1 :	General error. Start-up error, adjustment error…
0 2 :	Parity error or more than available characters.IT 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:

- If there is a parity error, frame number error, base price not valid, negative or zero weight or the scale is in error status, the scale responds with **NAK** to frames 1, 2, 3 or 4.
- When the scale is on any error status, it responds with **NAK** to the frame **E_TE_Q**.

4.35 OLIVETTI cash register protocol

Protocol

Cash Register ***Scale***

2800000WWWWWKC_RL_F

Where:

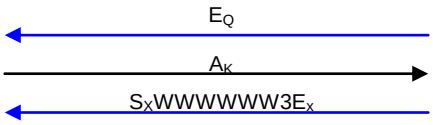
2:	0x32h	**8:**	0x38h
0:	0x30h		
WWWWW:	5 characters for weight.		
K:	XOR of previous characters		
C_R:	0x0Dh	**L_F:**	0x0Ah

NOTE:

- Once the key has been pressed the scale wait until it has stable, positive within range weight to send the answer.
- If the scale has a tare weight, it sends the net weight.

4.36 TF-1000 protocol

Protocol



Where:

E_Q:	0x05h
A_K:	0x06h
S_x:	0x02h
WWWWWW:	6 characters for weight. LSB left character, MSB right character
Ex:	0x03h
3:	0x33h set the position of decimal point

NOTE:

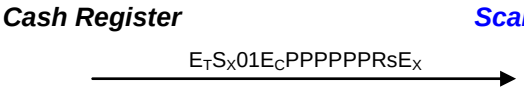
- The scale always sends Eq when the key is pressed.
- The weight is send from right to left (LSB→MSB).
- If the weight is out of range (with "--------" on the display), it sends the weight as 0.
- When the weight is unstable the scale sends the momentary weight.
- The value of the decimal point is a fix value.
- The scale sends the weight when it receives a Ak. The scales do not take into account if it sends an Eq or not.
- If the scale has a tare weight, it sends the net weight.

4.37 SHARP UP-800 cash register protocol

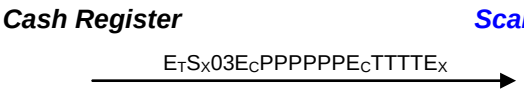
Protocol

There are 5 different frames.

Frame 1



Frame 2

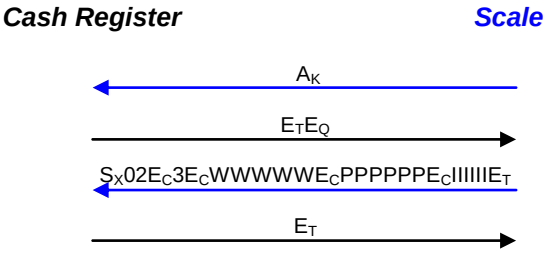


Frame 3

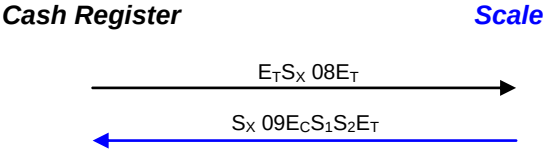
Frame 4

Frame 5

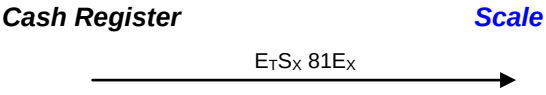
From the 5 different frames the protocol function as follows



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



The scale can receive a frame to reset price, amount and tare fields.



Where:

E_T:	0x04h		
S_x:	0x02h		
A_K:	0x06h		
E_C:	0x1Bh		
E_Q:	0x05h		
R_S:	0x1Eh		
0:	0x30h	**1:**	0x31h
2:	0x32h	**3:**	0x33h
WWWWW:	5 characters for weight		
PPPPPP:	6 characters for price		

IIIIII:	6 characters for amount
S:	amount sign (negative "-" 0x2Dh, positive " " 0x20h).
TTTT:	4 digits for the PLU tare

MMMMMMMMMMMM: 13 digits for the PLU description that the scale ignores (21 characters on the frame 5).

S_1 S_2 :	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.

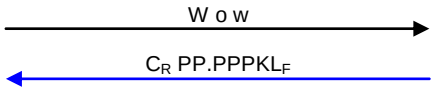
NOTE:

- This protocol is not for only weight scales.
- If there is a parity error, frame number error, base price not valid, negative or zero weight or the scale is in error status, the scale responds with **NAK** to frames 1, 2, 3 or 4.
- When the scale is on any error status, it responds with **NAK** to the frame $\mathbf{E_T E_Q}$.
- If the scale has a tare weight, it sends the net weight.
- The scale wait until it has stable weight to responds to frames 1, 2, 3, 4 or 5.
- 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** and set the status to 21.
- When the scale receives the frame 5 it responds with the same price and amount, it only adds the weight.

4.38 IBM protocol

Protocol

Cash Register ***Scale***



Where:	
W:	0x57h
w:	0x77h
C_R:	0x0Dh
PP.PPP:	5 characters for weight with decimal point.
.:	0x2Eh
K:	Checksum calculated from the arithmetic sum of weight digits, tanking the module 10 and making tens complement.
L_F:	0x0Ah

NOTE:

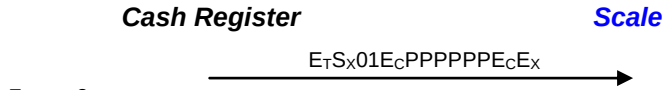
- The weight is only sent when it is positive within range or 00.000
- If when the cash register makes the request the weight is unstable, the scale waits until the weight would be stabilized.
- If the scale has a tare weight, it sends the net weight.
- If the weight is out of range (with "---------" on the display) the scale does not respond.
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale will not respond.
- If the amount overflows the scale does not respond.

4.39 DIALOG 06 protocol without attend to tare

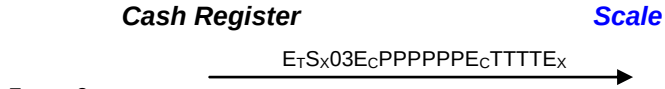
Protocol

There are four different frames.

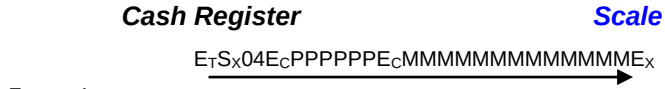
Frame 1



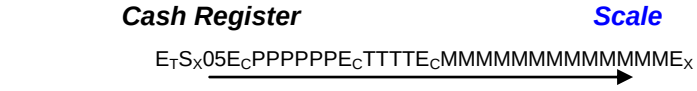
Frame 2



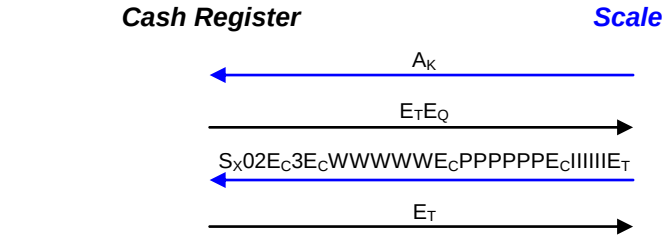
Frame 3



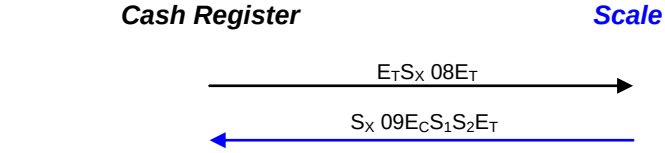
Frame 4



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		
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
IIIIII:	6 characters for amount
TTTT:	4 digits for the PLU tare
MMMMMMMMMMMM:	13 digits for the PLU description (ignored by the scale)

$S_1 S_2$:	Status
0 0 :	Correct.
0 1 :	General error. Start-up error, adjustment error…
0 2 :	Parity error or more than available characters. IT 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:

- When the scale receives the frames 2 and 4 it ignore the field tare.
- 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_T S_X$10E_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:

  $E_T E_Q$

  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:

  $E_T E_Q$

  And the scale responds

  S_X02… with the corresponding data

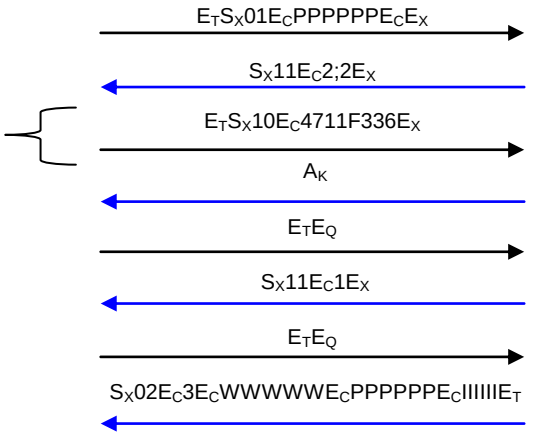
  or

  NAK if it has been an error.

Synchronization example:
- 1 kilo on the scale

V = **group of 8 characters, the Scale only**

Take into account the length



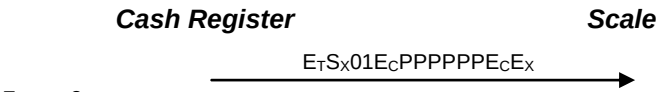
- When the scale detects an error for one of the following reasons, it responds with **NAK** to frames 1, 2, 3, o 4 :
    - Be in error status
    - Parity error
    - Received frame erroneous
    - Base price not valid
    - The tare is not valid
    - Negative weight
- When the scale detects an error 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
- When the scale responds with NAK because it receives a frame with the header bad identify or lack of any character in the tare field, it is required to send the status frame to the scale so the communication can be resynchronized. If the status frame is not sent the scale responds to every request with NAK.

4.40 DIALOG 06 protocol without attend to tare neither minimum weight

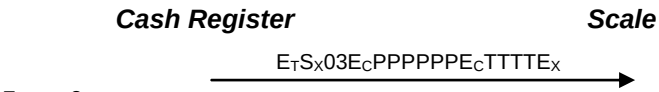
Protocol

There are four different frames.

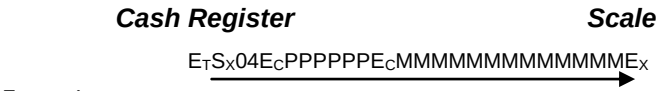
Frame 1



Frame 2

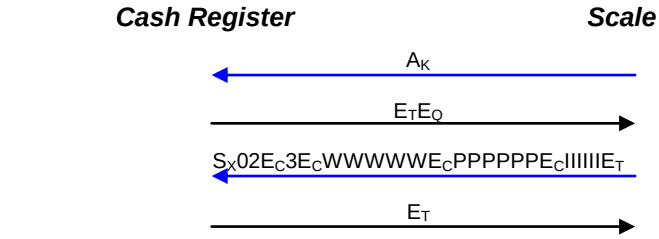


Frame 3

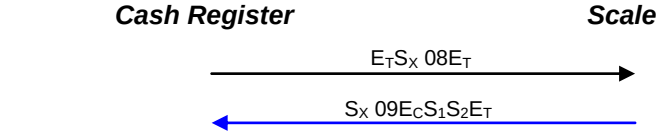


Frame 4

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		
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
IIIIII:	6 characters for amount
TTTT:	4 digits for the PLU tare
MMMMMMMMMMMMM:	13 digits for the PLU description (ignored by the scale)

$S_1 S_2$:	Status
0 0 :	Correct.
0 1 :	General error. Start-up error, adjustment error…
0 2 :	Parity error or more than available characters. IT 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:

- When the scale receives the frames 2 and 4 it ignore the field tare.
- This protocol not considers the minimum weight as error.
- 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

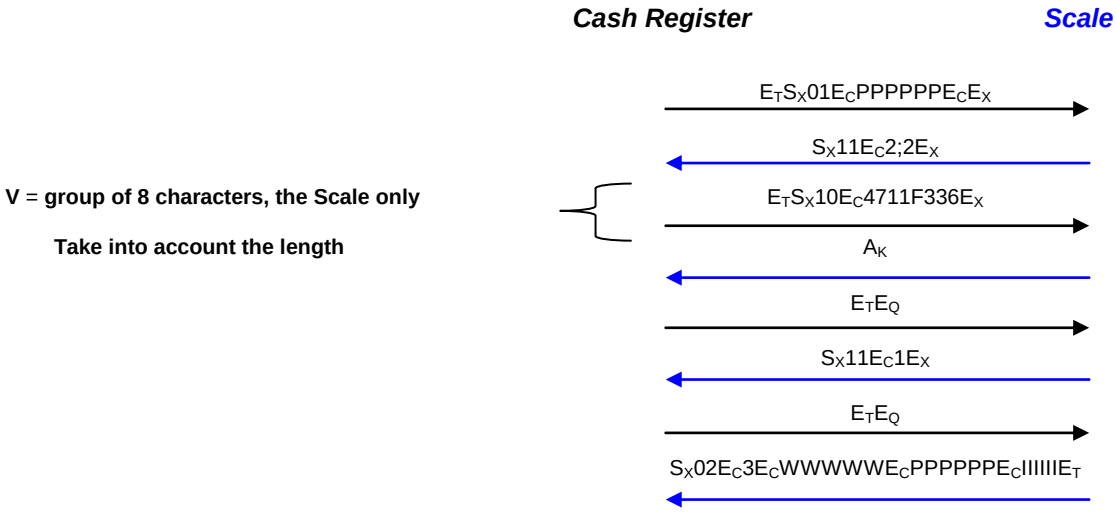
  And the scale responds

  S_X02… with the corresponding data

  or

  NAK if it has been an error.

Synchronization example:
- 1 kilo on the scale

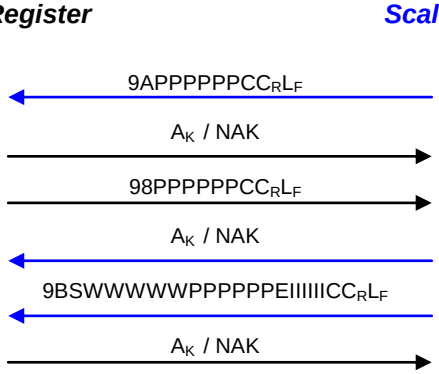


- When the scale detects an error for one of the following reasons, it responds with **NAK** to frames 1, 2, 3, o 4 :
    - Be in error status
    - Parity error
    - Received frame erroneous
    - Base price not valid
    - The tare is not valid
    - Negative weight
- When the scale detects an error 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
- When the scale responds with NAK because it receives a frame with the header bad identify or lack of any character in the tare field, it is required to send the status frame to the scale so the communication can be resynchronized. If the status frame is not sent the scale responds to every request with NAK.

4.41 Reserved

4.42 DIBAL Terminal protocol

Protocol



Where:

9A:	0x38h y 0x41h		
98:	0x38h y 0x39h		
PPPPPP:	6 characters for price.		
C:	Checksum, login add (XOR) of all previous characters.		
C_R:	0x0Dh	**L_F:**	0x0Ah
A_K:	0x06h		
9B:	0x39h y 0x42h		
S:	Weight status. 0: 0x30h Correct. 1: 0x31h Error.		
WWWWW:	5 characters for weight.		
E:	Amount status. 0: 0x30h Correct. 1: 0x31h Error.		
IIIIII:	6 characters for amount.		

NOTE:

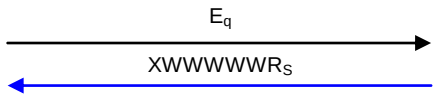
- When the key (undefined) is pressed the scale sends price request frame with displayed price. If the scale receives an **ACK**, then it will receive a frame with the price. If the scale receives a **NAK** instead an **ACK**, it will send again the price request frame.
- The scale responds with a **NAK** if it receives the price or the checksum erroneous.
- When the total key is pressed the scale waits until it has a stable, positive within range weight to send the weight, price and amount frame.
- If there is not weight (00.000), the scale does not send the price, weight and amount frame when the total key is pressed.
- If the amount overflows, the scale does not send the price, weight and amount frame when the total key is pressed.
- If the scale receives a **NAK** instead **ACK**, it will send the appropriate frame (**9APPPPPPCC$_R$L$_F$** or **9BSWWWWWPPPPPPEIIIIIICC$_R$L$_F$**).
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale will not respond.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1, the scale will not respond if the weight is lower than 20 steps.

Contact with the technical support department for more information.

4.43 IBM/HUGIN "SERD" for cash register CHD 3010 protocol.

Protocol

Cash Register ***Scale***



Where:

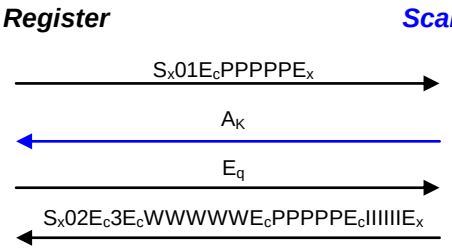
E_q:	0x05h
X:	0x20h "blank space"
WWWWW:	5 characters for weight.
R_S:	0x1Eh

NOTE:

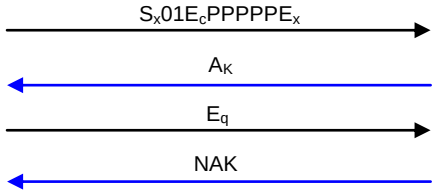
- If the Scale receives something different to EQ does not respond.
- The scale waits until it has a stable, positive (or zero) within range weight to respond to **E_q** frame.
- If the scale has a tare weight, it sends the net weight.

4.44 ANKER cash register protocol with zero weight sending

Protocol



If the weight is unstable, negative or out of range



Where:

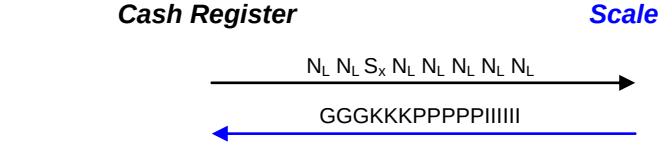
S_x:	0x02h	**A_K:**	0x06h
01:	0x30h y 0x31h	**E_x:**	0x03h
E_c:	0x1Bh	**NAK:**	0x15h
WWWWW:	5 characters for weight.		
PPPPP:	5 characters for price.		
IIIIII:	6 characters for amount.		

NOTE:

- It is allowed the sending of the frame of price, weight and amount when the weight is zero. It is necessary to have set to zero the minimum weight adjustment.
- After the scale responds with **A_K** there is timeout of a second to receive **E_q**, if this time expired the scale does not respond to **E_q**.
- Between different requests the weight must vary at least 20 steps or pass through zero, otherwise the scale responds with **NAK.**
- If the weight is unstable, zero, negative or erroneous (with "-------" on the display), the scale respond with **NAK**.
- If the amount overflows the scale send 000000 in the field **IIIIII**.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.45 COM (DATECS 2) Protocol

Protocol



Where:

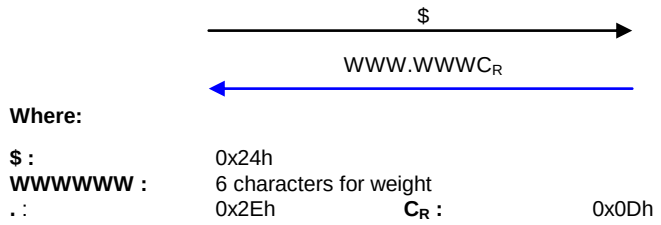
N_L:	0x00h	**S_X:**	0x02h
GGG:	3 characters for grams.		
KKK:	3 characters for kilograms.		
PPPPP:	5 characters for price.		
IIIIII:	6 characters for amount.		

NOTE:

- The scale does not send the frame if the weight is not higher than the value configured in the grams window adjustment.
- The scale always sends zeros (in hexadecimal 0x00h) on the fields of price and amount.
- The scale responds with **NAK** (and restarts the communications) when it receives an incorrect character.
- The scale sends the data of the frame **GGGKKK** from right to left (LSB→MSB), these data are in hexadecimal. For example, 5,492kg is sent as 0x02h 0x09h 0x04h 0x05h 0x00h 0x00h.
- The scale does not send the weight frame it is zero, negative or is out of range.
- The scale sends the momentary weight if it is unstable.
- If the scale has a tare weight, it sends the net weight.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1, the scale will not respond 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 will not respond**.**

4.46 SAMSUNG-CHINA cash register protocol

Protocol



Where:

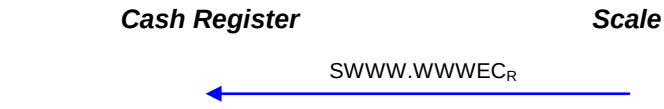
$:	0x24h		
WWWWWW :	6 characters for weight		
. :	0x2Eh	**C_R :**	0x0Dh

NOTE:

- The scales respond to **$** when it receives the request.
- The scale sends the weight as zero if it is zero, negative or it is out of range.
- The scale sends the momentary weight if it is unstable.
- The whole part of the weight is filled with zeros when there is not unit, tens or hundreds on the weight.
- The scale does not take into account the minimum weight adjustment.
- It is no necessary to vary 20 steps the weight or pass through zero.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.
- If the scale receives a character different to **$,** it does not respond.

4.47 Hunan Weiboshi protocol

Protocol



Where:

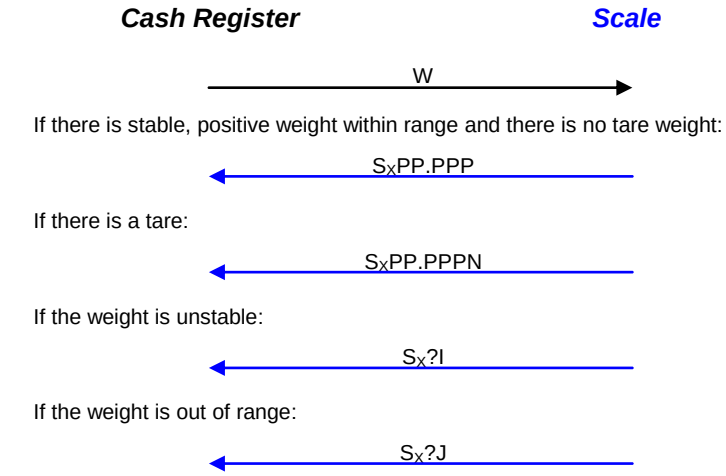
S:	0x53h
.:	0x2Eh
WWWWWW:	6 characters for weight.
E:	0x45h
C_R:	0x0Dh

NOTE:

- The scale sends the weight frame every time that it has stable, positive weight within range.
- If the key is pressed and the previous statement is satisfied, the scale sends again the weight frame.
- The scale does not take into account the minimum weight adjustment.
- It is no necessary to vary 20 steps the weight or pass through zero.
- If the scale has a tare weight, it sends the net weight in the field **WWWWW**.

4.48 METTLER (PRECIA) protocol

Protocol



Where:

W:	0x57h
S_X:	0x02h
PP.PPP:	5 characters for weight separate with decimal point.
.:	0x2Eh
N:	0x4Eh
?:	0x3Fh
I:	0x49h
J:	0x4Ah

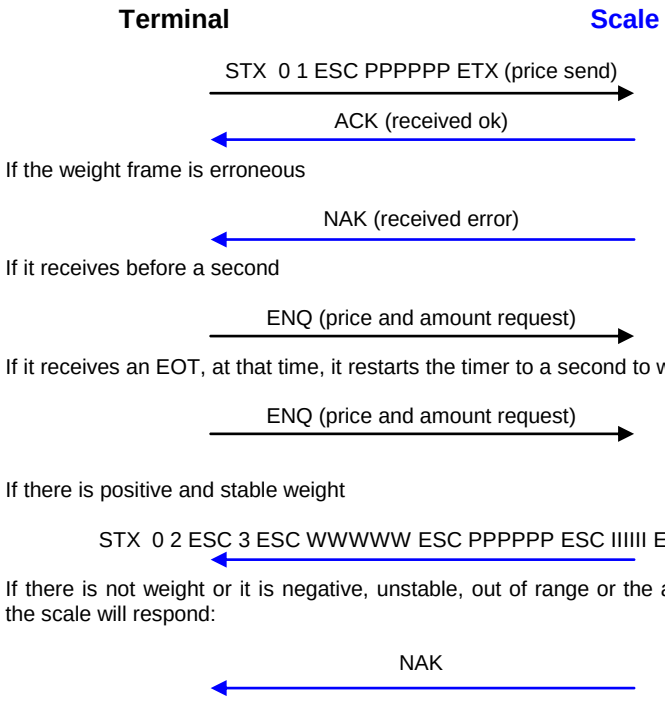
NOTE:

- If the weight is zero the scale responds with **S_X00.000**.
- If the weight is negative because there is a tare, the scale responds with **S_X00.000N**.
- The scale does not take into account the minimum weight adjustment.
- It is no necessary to vary 20 steps the weight or pass through zero.

4.49 CARREFOUR protocol

Protocol

The scale waits until it receives the price frame



Where:

STX	0x02h
ETX	0x03h
EOT	0x04h
ENQ	0x05h
ACK	0x06h
NAK	0x15h
ESC	0x1bh
WWWWW	5 characters for weight
PPPPPP	6 characters for price
IIIIII	6 characters for amount

NOTE:

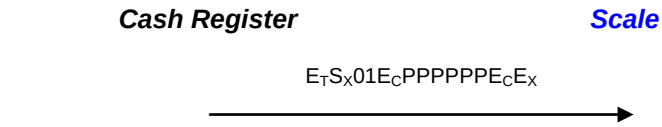
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1, the scale responds with **NAK** if the weight is lower than 20 steps.
- It is no necessary to vary 20 steps the weight or pass through zero.

4.50 DIALOG 02/04 Protocol

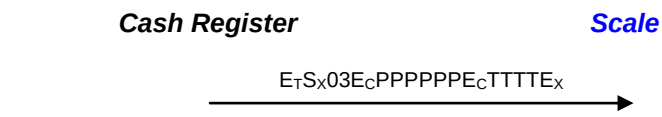
Protocol

There are four different frames.

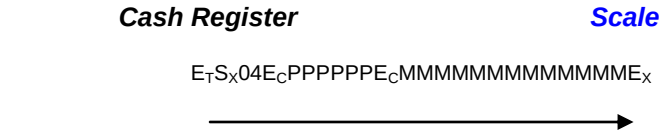
Frame 1



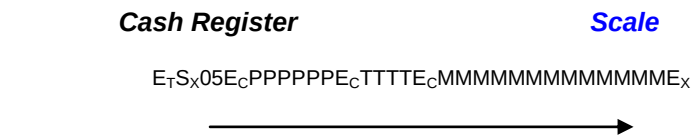
Frame 2



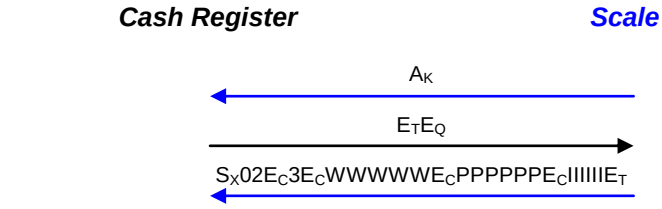
Frame 3



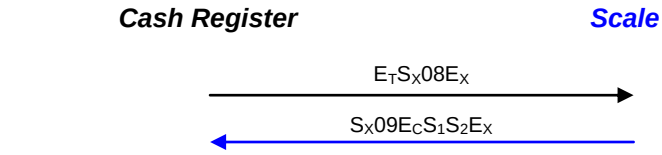
Frame 4



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	**3:**	0x33h
S_x:	0x02h	**4:**	0x34h
A_K:	0x06h	**5:**	0x35h
E_C:	0x1Bh	**8:**	0x38h
E_Q:	0x05h	**9:**	0x39h
0:	0x30h		
1:	0x31h		
2:	0x32h		

WWWWW:	5 characters for weight
PPPPPP:	6 characters for price
IIIIII:	6 characters for amount
TTTT:	4 digits for the PLU tare
MMMMMMMMMMMMM:	13 digits for the PLU description (ignored by the scale)

S_1 S_2 :	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:

- The status frame can be sent on any occasion. The scale will respond with the actual status.
- If there is weight on the plate and it sent a frame of tare and price with the value of the tare higher than the weight on the plate, the scale gets only the tare and responds with **ACK**. Then it will respond with **NAK** to the following request of amount.
- If the scale does not have weight and it receives a frame with tare, the scale ignores the tare and responds with **ACK**. Then it will respond with NAK to frame $\mathbf{E_T E_Q}$.
- If the scale has unstable weight, overload or zero weight, it responds to frames 1, 2, 3 and 4 with **ACK.** Then it will respond to frame $\mathbf{E_T E_Q}$ with **NAK**.
- The scale takes into account the minimum weight adjustment. If this adjustment has the value 1, the scale will respond with **NAK** and set the status to 30 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 will respond with 20 and set the status to 21**.**

La información contenida en este manual puede ser modificada por el fabricante sin previo aviso.

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Versión Firmware: V – 1.08

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