S.C.D. Sistemi di Controllo Digitali
Via Cittadella 65, 41100 Modena (Italy)
tel/fax 059 223744
www.essecidi.it e.mail: scd@essecidi.it

PROGRAMMABLE ELECTRONIC PARTIAL/TOTAL COUNTER with SERIAL RS232 INTERFACE

CE1_2PSP_FC

(V10.17)

technical specifications
electrical connections
several applications notes
general informations

CE1_2PSPFC: programmable electronic device for pulses counting, partial/total, and RS232 interface
It processes and displays pulses acquired by common transducers for industrial automation (normally by incremental rotary encoder). Simple operations from the front keyboard allow to program the various work functions: slowdown and stop thresholds, protocol for serial transmission, percentage correction factor, absolute correction factor, decimal number digit. The RS232 serial interface allows connection to a remote device (PC) for bidirectional datatransfer, according to specific applications.

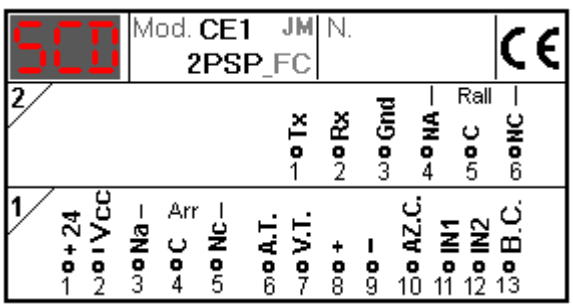
Technical features (common for CE1…. series)

Operating Voltage	**24 - Vcc** (also available 24 - 115 - 230 Vac 50/60 Hz)
Max Power consumption	4 W
Available Power	for transducer (encoders, sensors…): 12 Vcc, 80 mA
Display	6 digit red led (or 5 + sign), display height 14,2 mm
Display range	-99999 to 999999; decimal point are programmed by front panel keys
Data Storage	on eeprom / flash (count values and programmable values at power off)
Inputs	6 - NPN (o PNP) opto-coupled
Output	2 – Electromeccanical relay
Serial interface	Bidirectional RS232C (not opto-coupled)
Programming	4-button keyboard scratch resistant polycarbonate
Connections	removable screw terminal block (p. 5,08 mm)
Container	DIN 96 X 48 X 124 mm, for frontal panel, self-extinguishing material
Overall dimensions	96 X 48 X 145 mm (including terminal block)
Operating temperature	-10°C – +50 °C
Ext. protection	IP64

1 – ELECTRICAL CONNECTION

(13-pin removable terminal block horizontal clamping)

TERMINAL NUMBER	CODE	DESCRIPTION
Term. block 1		
1	" + "	**24 Vcc** Power supply: 24 Vcc (also available 24 – 115 - 230 Vac)
2	" **-** "	(check the applied label)
3	**NA**	Stop relay: switch for about a second, when the count reaches
4	**C**	the value programmed at setting *1*
5	**NC**	250V, 1A
6	**A.T.**	Input (npn): Total. Reset: when it is closed to < **-** > displays and Reset the Total count. Keep closed (3 sec) until 000000 appears on the display.
7	**V.T.**	Input (npn): Totalizer display: close to terminal < **-** >
8	**+**	+12Vcc, 80 mA, power supply output (encoder)
9	**-**	Common: Negative power supply; NPN reference
10	**AZ.C.**	Reset displayed count: close to terminal < **-** > for about 1 sec.
11	**IN1**	Pulses input channel "A" (npn)
12	**IN2**	Pulses input channel "B" (npn)
13	**B.C**	Count Lock: this input inhibits pulses counting when closed to "- "
Term. block 2		
1	**Tx**	RS232 Trasmitter
2	**Rx**	RS232 Receiver
3	**Gnd**	Common Rx and Tx
4	**Na**	Slowdown Relay (250V, 1A)
5	**C**	switch when the displayed value reaches < *setting 1* ─ *setting 2* >
6	**N**	come back with the *stop-relay*



Terminal block - Connections – Correcting Factor

CE1_2PSP

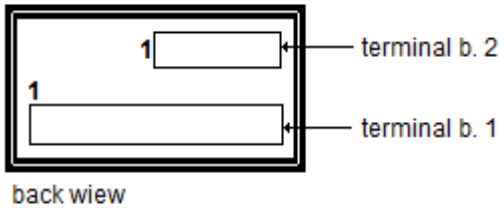


fig. 1

encoder connection

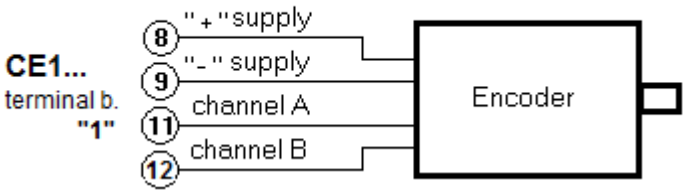


fig. 2

RS232 connection

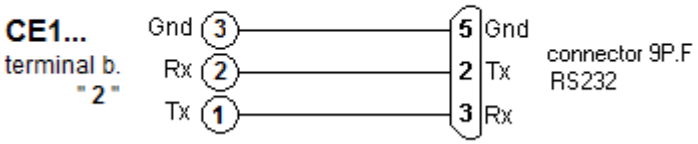
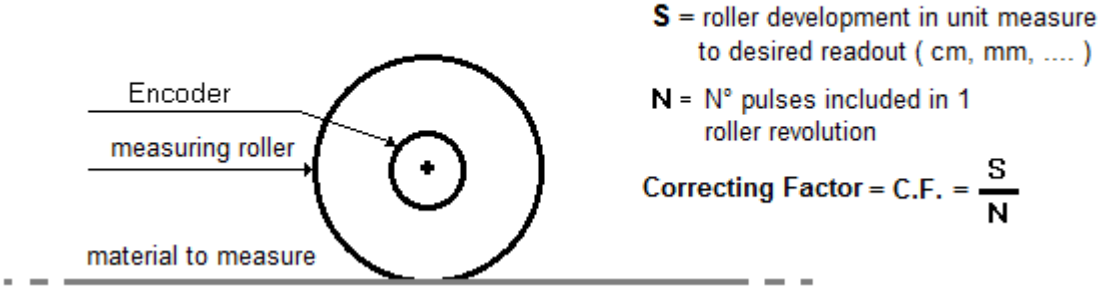


fig. 3

Correcting Factor Calculation (C.F.)



S = roller development in unit measure to desired readout (cm, mm, ...)

N = N° pulses included in 1 roller revolution

Correcting Factor = C.F. = $\frac{S}{N}$

fig. 4

2 - GENERAL DESCRIPTION

1 – A 6-digit number with decimal point is **normally displayed** at power-on: indicates the partial count:
< **C_1 C_2 C_3 C_4 . C_5 C_6** >
Left and not significant 'zeros' are non coming displayed.
C_1 can represent the " - " if the count is negative

2 - The position of the ***decimal point*** is fixed by the setting 3 (*see setting 3/*D pg. 6)

3 – **Absolute Correction Factor (C.F.)**: the device, count pulses received from a sensor (encoder…) In many cases the incoming pulses do not represent the desired display readout; for this reason it is important to program a correction factor to obtain the desired readout. It's a number that represents the ratio: **unit of measure readout / N° pulses per single unit of mesure.** This number must be calculated by the user, in accordance with the connection between transducer (encoder) and measuring roller.. (see *pag.3, fig.4*)
For ex.(rif. Fig. 4 pag 3): S = 50 cm, N = 50 pulses -- > C.F.. = 1.000
S = 50 cm. N = 25 pulses -- > C.F. = 2.000
S = 50 cm, N = 100pulses-- > C.F. = 0.500
(NB - C.F. = 0.000 has no meaning and is always considered as 1.000)

4 - **Percent correcting factor** of the count: once the C.F. has been established, depending on the material to be measured and / or dragging system, a percentage correction can be made of the measure to be displayed both up and down. This value must also be calculated according to the needs of the user. The value 00.0 excludes this function (see setting 4, page 6)
The *percentage correcting-factor* of the count can be **calculated automatically**, following the indications described on page 13

5 - **The Reset of the displayed count** can be made:
activating the *input* AZ.C (terminal 10-1) or by *pressing the GREEN button* on the front panel or with *appropriate command* from serial port (see from chapter 7 page 7 and following)

6 – **Total Count**: it is increased by the partial value each time the reset is carried out. It is displayed with one decimal less than the partial count. It is managed by the A.T. and V.T. (term. 6-1 and 7-1)

7 - **Bidirectional counting** speed: 2.0 Khz

8 - 3 operating modes can be programmed to obtain **slowdown + stop**:
a - *CYCLIC Slowdown + Stop*: outputs switch cyclically when counting reaches the value of integer multiples of setting 1
The outputs are reset after about 1 second
b - *CP25*: is an application that allows to switch outputs for a predetermined number of counting units (25 or 250) when multiple integers are reached of the Setting 1. If, for example, a count is made in cm, the stop switches for 25 cm. (for 250 mm for count in mm). Only valid if selected 2 or 3 decimals.
c - *NON-CYCLIC Slowdown + Stop*: the outputs switchs once only when they are reached setting 1 (deactivate outputs with 'Reset' - see setting 3/C, page. 6)

9 – **Serial Interface RS232**: (see features, chap. *7*)

10 - The value of the **slowdown distance**, (setting 2) must be less than the value of the stop value; otherwise the counting is carried out with the slow motion always activated.
If setting 2 is = 0000, the slowdown is not carried out.

11 - The serial command < **B** p0 p1 p2 p3 p4 >, consists in acquiring of a value that allows performing a *slowd + stop sequence* at the value constituted by the sum of the *displayed count + the new acquired value* (not programmable from the keyboard)

12 – **VERY IMPORTANT:** *After changing one or more settings, a **reset** is required*
Terminal 10/1 or **Green Botton** or **Serial Command**

3 – PROGRAMMING INTRUCTIONS

Keys Function:

Access Programming mode

Count Reset

Select the digit to be changed

Edit the selected digit by one unit increase

PROGRAMMING MODE ENTRY (Set 1 to set 6):

- settings 1 and 2, you can directly access by click Red button
- the following settings are accessed by holding down the Red button for at least 3 seconds
- the programming phase is signaled by the lighting up of the YELLOW LED

PARAMETERS:

1 – Setting 1:STOP-MEASURE: 1 - Press the RED BUTTON. The display shows: < **X X X X. X X** > which represents the value of the previously set stop measurement.
To change this value, use the UP ARROW key to change the digit that flashes up to desired value (each press -> one unit increase).
2 - To change the following digits, press the DOWN ARROW key to select the desired digit. Each time this button is pressed, the digit flashes immediately to the left of the one that previously flashed Change the selected digit as in the previous step.
3 - Once the desired value has been made, press the RED BUTTON to store the displayed value and open the NEXT SETTING (slow down)

2 - **Setting 2: SLOWDOWN LENGTH**: after previous step 3 the display shows: < **2 R R. R R** > which represents the value of the slowing distance previously used.
Modify the digits as the previous paragraph.
Press the RED BUTTON again to close the Programming

3 – Setting 3: PROTOCOL and SERIAL FEATURES - STOP MODE - DECIMAL POINT

1 - Press and hold the ***RED KEY for 3 SECONDS***: the display shows: < **3 A B C D** >
The meaning of the displayed digits is described in detail in chap. 4
To change these digits, follow the procedure described for 'setting 1'.
2 - Once the desired value is displayed, press the RED KEY (click) to access Next Setting

4 – Setting 4: PERCENTAGE CORRECTING FACTOR

1 - after executing the previous step 2, the display shows: < **4 S P P. P** >
The meaning of the displayed digits is described in chap. 5
Change as before or:
2 - Press the RED button again (click)

5 – Setting 5: STOP AFTER-RESET

1 - The display shows: < **5 X X. X X** >
where X X. X X is the value of the Stop- measure after performing a Reset operation
A *slowdown+stop sequence* is executed (for once) at this setting value.
This function is enabled only if X X. X X is different from <0 0. 0 0>
2 – Next Setting: Press the RED button again (click)

6 – Setting 6: ABSOLUTE CORRECTING FACTOR

1 - The display shows: < **6 F. F F F** >
where F.FFF is the value of the correcting factor previously set.
Change as in previous modality.
2 - Finally press the RED (click) button to end programming.

4 – SETTING 3

(*serial protocol –slow/stop- count mode – decimal point*)

< **3 A B C D** >

D – Decimal point position
- **0** = XXXXXX no decimal point
- **1** = XXXXX**.**X 1 decimal
- **2** = XXXX**.**XX 2 decimals
- **3** = XXX**.**XXX 3 decimals

C - Slowd.+stop mode
- **0** = Slowdown+stop. (carried out cyclically)
- **1** = CP25 (stop lasts 25/250 units: cyclic)
- **2 =** Slowdown+stop (carried out only once)

B – continuous transfer / transfer on request
(*see SERIAL TRASMISSION specification, pag.7)*
- **(4) 0** = **continuous** transfer of displayed count value
- **(5) 1** = transfer on **request**: **1 command-character**
- **(6) 2** = transfer on **request**: **3 command-character**
- **3** = transfer on request: **1** or **3 characters** with **6 digit data-string**
- **(8) = continuous** transfer with **6 digit data-string**

A – Baud rate
- **0** = 1200 Baud **2** = 4800 Baud
- **1** = 2400 Baud **3** = 9600 Baud

(the word format is always **N,8,1**)

NOTE - Parameter **B**: - Normally (B=0,1,2) the **data-string** contains the *least significant 5 digits*. (5 right-most digits on the display)
- the **data string** contains the *5 most significant digits* if B is associated with the characters in brackets (B = (4), (5), (6)).

5 – SETTING 4

(*Percent correcting factor* of the detected count)

This factor provides a percentage correction of the measured value on the increase (if positive) or decreasing (if negative) The change is displayed immediately at each count made.
In the setting phase, this value takes the form:

< **4 S P P. P** >

where: **4** = setting number
S = sign: = '0' for increasing correction; '-' for decreasing correction.
PP.P = value between 00.0 and +/- 99.9
The sign can be changed alternately in - or + with the UP-Arrow key, when 'S' is flashing.
If PP.P = 00.0, the factor has no effect and the displayed value is the real value detected.

6 – SETTING 5

(*Stop after reset*)

Allows you to perform (one time only) a *slowd. + stop sequence,* when the count reaches this value..

< **5 X X. X X** >

where: 5 = setting number
XX.XX = Stopping point

This function is enabled only if XX.XX is different from 'zero' and after having carried out one reset operation (with remote contact **AZ.C** or **green key** or with **reset-command** from serial line)

7 - SERIAL COMMUNICATION

Introduction

The RS232 serial interface connects the Counter with a Personal Computer or similar device,to transmit DETECTED COUNT and receive the various commands (ZEROING, STOP PRESET, SET starting counting ...).
The informations are transmitted and received via strings, whose general structure is:

<**start string**> + <**command**> + <**data string**> + <**control**> + <**end string**>

start string	hexadecimal character 02Hex = 2 decimal (stx)
command	alphabetic-uppercase ASCII character
data string	ASCII numeric characters
control	EX-OR of the data string characters
end string	hexadecimal character 0DHex = 13 decimal (cr)

During *transmission* to P.C., the **'data string'** contains the value of the *displayed count*.
Receiving from P.C. the **'data string'** contains the various *setting values*.
The 'data string' can be composed of *5 or 6 characters* according to the chosen programming.
If it consists of 5 characters, they can represent the 5 most significant digits or the 5 least significant digits for both the count and for setting values.
Example:
if the displayed value is <1 2 3 4 5 6>: 2 3 4 5 6 represent the 5 least significant digits
1 2 3 4 5 represent the 5 most significant digits
Similar considerations apply to the setting values.
The selection between the most significant and least significant digits occurs via parameter B of setting 3 (see page 6) and applies to both transmitted and received data strings.
The case of the data string consisting of 6 characters will be examined at the end of the chapter.
The specifications described below refer to a data string of 5 characters.

The request from the PC and the data transmission by the counter is done according to different and programmable modality, through the parameters B and D of the setting 3, named for the sequel, respectively **3B** and **3D**.

Mode 1 – **continuous counting transfer** by the counter (without PC request)
and receiving the commands described below (**3B -> 0** or **3B -> 4**)

Mode 2 - **counting request** to the counter through **3 characters** command string
(**3B -> 2** or **3B -> 6**)

Mode 3 - **counting request** to the counter through **1 characters** command string
(**3B -> 1** or **3B -> 5**)

See specifications of the 3 cases on the following pages.

7.1 - CONTINUOUS TRANSFER

(Put <0> or <4> in the <B> setting 3)

a - The counter continuously transmits a string consisting of 8 characters containing the <u>displayed count</u> value:

< STX, D_0, D_1, D_2, D_3, D_4, LRC, CR >

D_0 ..... D_4 = displayed value (5 ASCII numeric characters) = data string
STX = 2 (decimal) 02 (hexadecimal) = start string
CR = 13 (decimal) 0D (hexadecimal) = end string
LRC = D_0 xor D_1. . . xor D_4 = control

b - <u>Counter Reset + Stop Set</u> Reception

The PC. must send to the counter the *Reset command* and the new *Stop preset*;
the counter momentarily displays the received preset value and then: 0. 0 0.
The PC. must send a string like:

< **STX, A, P_0, P_1, P_2, P_3, P_4, LRC, CR >** (9 characters)

A = A (uppercase ASCII character) = command
P_0 ..... P_4 = preset digits (5 ASCII numeric characters) = data string
STX = 2 (decimal) 2 (hexadecimal) = start string
CR = 13 (decimal) 0D (hexadecimal) = end string
LRC = P_0 xor P_1 xor. . . P_4 = control

c – <u>Counter-reset</u> reception (A)

The PC. must send the *Reset command* to the counter:

< **STX, A, CR** > (3 characters)

A = A (uppercase ASCII character) = start string
STX = 2 (decimal) 2 (hexadecimal) = command
CR = 13 (decimal) 0D (hexadecimal) = end string

d – <u>Stop-Setting</u> Reception without Zeroing (B)

The PC. must send a string like:

< **STX, B, P_0, P_1, P_2, P_3, P_4, LRC, CR >** (9 characters)

B = B (uppercase ASCII character) = command
P0 ..... P4 = preset digits (5 ASCII numeric characters) = data-string
STX, CR, LRC = as above described = start,stop,control
The counter displays the received value momentarily and carries out a *slowd. + stop sequence* at value: < *displayed value + received value* >

e - Receiving a <u>count value to be displayed</u> (C)

The PC. must send a string like:

< **STX, C, P_0, P_1, P_2, P_3, P_4, LRC, CR >** (9 characters)

C = C (uppercase ASCII character)
P0 ..... P4 = digits to be displayed (5 ASCII numeric characters)
STX, CR, LRC = as above described
The acquired value replaces the displayed value as a count value
The counter does not reply and continues the transmission as in **§ a**.

7.2 – <u>"3 CHARACTERS" COUNTING REQUEST TRANSFER</u>
(pUT < **2** > o < **6** > in the < **B** > setting 3

a – <u>Displayed-count</u> transmission (M)

The PC. send the 3 characters string: < **STX, M, CR** >
The counter responds (8 characters): < **STX, D_1, D_2, D_3, D_4, D_5, LRC, CR** >

D_1 .... D_5	= displayed count (5 ASCII numeric characters)	= data string
STX	= 2 (decimal) 2 (hexadecimal)	= start string
CR	= 13 (decimal) 0D (hexadecimal)	= end string
M	= M (uppercase ASCII character)	= command
LRC	= D_1 xor D_2 .... xor D_5.	= control

b – **<u>Counter-Reset</u> Reception (A)**

The PC. send the 3 characters string: **< STX, A, CR >**

A	= A (uppercase ASCII character)	= command
STX, CR	= (see above)	

The counter does not reply and displays < **0 . 0 0** >

c – **<u>Counter Reset</u> + <u>Stop Setting</u> Reception (A + Pres.)**

The PC. must send to the counter the *Reset command* and the new *Stop preset*; the counter momentarily displays the received preset value and then: 0. 0 0.

The PC. must send a string like:
STX, A, P_0, P_1, P_2, P_3, P_4, LRC, CR (9 characters)

A	= A (uppercase ASCII character)	= command
P_0 ..... P_4	= new stop value (5 ASCII numeric characters)	= data string
STX	= 2 (decimal) 02 (hexadecimal)	= start string
CR	= 13 (decimal) 0D (hexadecimal)	= end string
LRC	= P_0 xor P_1 xor. . . P_4	= control

d - **<u>Stop-Setting Reception without Zeroing</u> (B)**

The PC. must send a string like:
STX, B, P_0, P_1, P_2, P_3, P_4, LRC, CR (9 characters)

B	= B (uppercase ASCII character)	= command
P_0 ..... P_4	= new stop value (5 ASCII numeric characters)	= data-string
STX, CR, LRC	= as above described	= start,stop,control

The counter displays the received value momentarily and carries out a *slowd. + stop sequence* at value: < *displayed value + received value* >

e - Receiving a count value to be displayed (C)

The PC. must send a string like:
STX, C, P_0, P_1, P_2, P_3, P_4, LRC, CR (9 characters)

C = C (uppercase ASCII character)
P0 ..... P4 = digits to be displayed (5 ASCII numeric characters)
STX, CR, LRC = as above described
The acquired value replaces the displayed value as a count value
The counter does not reply.

7.3 – "1 CHARACTER" COUNTING REQUEST TRANSFER

(put < **1** > or < **5** > in the < **B** > setting **3)**

a – Displayed-count transmission (M)

The PC. send the character: < **M** >
The counter responds (8 characters): < **STX, D_1, D_2, D_3, D_4, D_5, LRC, CR** >
D_1 .... D_5 = displayed count (5 ASCII numeric characters) = data string
STX = 2 (decimal) 2 (hexadecimal) = start string
CR = 13 (decimal) 0D (hexadecimal) = end string
M = M (uppercase ASCII character) = command
LRC = D_1 xor D_2 .... xor D_5. = control

b – Counter-Reset Reception (A)

The PC. send the character string: **< A >**
A = A (uppercase ASCII character) = command
The counter does not reply and displays < **0 . 0 0** >

c – Counter Reset + Stop Setting Reception (A + Pres.)

The PC. must send to the counter the *Reset command* and the new *Stop preset*;
the counter momentarily displays the received preset value and then: 0. 0 0.
The PC. must send a string like:
< A, P_0, P_1, P_2, P_3, P_4 > (6 characters)
A = A (uppercase ASCII character) = command
P_0 ..... P_4 = **new stop value** (5 ASCII numeric characters) = data string

d - Stop-Setting Reception without Zeroing (B)

The PC. must send a string like:
< B, P_0, P_1, P_2, P_3, P_4 > (6 characters)
B = B (uppercase ASCII character) = command
P_0 ..... P_4 = new stop value (5 ASCII numeric characters) = data-string
The counter displays the received value momentarily
and carries out a *slowd. + stop sequence* at value: < ***displayed value + received value*** >

e - Receiving a count value to be displayed (C)

The PC. must send a string like:
< C, P_0, P_1, P_2, P_3, P_4 >(6 characters)
C = C (uppercase ASCII character) = command
P0 ..... P4 = digits to be displayed (5 ASCII numeric characters)
STX, CR, LRC = as above described
The acquired value replaces the displayed value as a count value
The counter does not reply.

7.4 - ON REQUEST TRANSFER WITH 6 CHARACTER DATA STRING

By setting the parameter **3D = 3** it is possible to transmit and receive a *data-string of 6 characters,* both for the count that for the setting parameter.
The continuous transmission mode is excluded from this type of operation.
The type of 1-character or 3-character reception is automatically selected.
The composition of the transmission and reception strings is similar to that described in *paragraphs 7.2 and 7.3*, considering a *data string of 6 characters instead of 5*.

7.5 CONTNUOUS TRASNFER WITH 6 CHARACTER DATA STRING

If parameter **3B = 8**, this function is activated. See the contents of the *paragraph 7.1 considering a data string of 6 characters instead of 5.*

7.6 SERIAL TRANSMISSION SUMMARY

		Setting 3	
Data string	**Mode**	**B**	**D**
5 digits MOST signif	Continuous	0	0 – 3
	On request 1 chr.	1	0 – 3
	On request 3 chr.	2	0 - 3
5 digits LEAST signif.	Continuous	4	0 - 3
	On request 1 chr.	5	0 - 3
	On request 3 chr.	6	0 - 3
6 digits	Continuuous	8	0 - 3
	On request 1 chr.	3	0 - 3
	On request 3 chr.	3	0 - 3

8 - SPECIAL FUNCTIONS

8.1 - Direct activation / deactivation of the Stop output

This function is used to directly activate or deactivate the stop output (terminals 3-1, 4-1, 5-1) with appropriate commands transmitted to the counter via the serial port.
The string structure that the counter must receive remains the same as described above, where < *command* > consists of < **S** > or < **R** > and without the < *data-string* > .
Depending on the programming made (3 characters or 1 character), when the counter receives:

a - < S > command: the stop relay is activated (terminals 3-1.4-1.5-1)
the reception of the command is signaled by the red LED 2 flashing
b - < R > command: the stop relay is deactivated; led 2 off

8.2 - The "-" sign of the count: Serial transmission

When the count shown on the display is negative, (decrease compared to the zero point) the "**-**" sign appears on the leftmost digit.
At the request from the PC, the "minus" sign is also transmitted in the response string.

The character that identifies it is "**2D Hex**" which corresponds to the ascii < **-** > character and in the string takes the place of the most significant digit of the count.
Example:

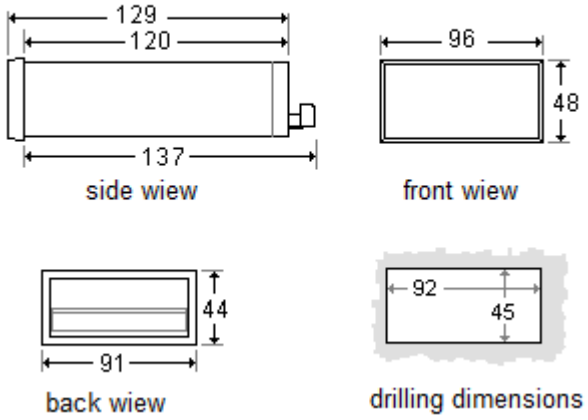
if the display shows: < **- 0 1 2 3 4** >, the transmitted string will be:

< **STX, -, D_2, D_3, D_4, D_5, LRC, CR** > (see chapter 7)
When the count is positive, everything behaves as described in chap. 7.

9 - DIMENSIONS, KEYBOARD, SIGNALING LEDS

Container

Dimensions (in millimeters)



Keyboard - Leds

yellow (1) - Lights-on during programming
red (2) - ON: indicates the stop-output activated
red (3) - ON: indicates the slowdown-output activated

LEDs simultaneously lit.
During data transfer via serial port, the momentary and simultaneous lighting of the three LEDs indicates an anomaly in data reception.

>>> Do not use any kind of tools (screwdriver, pens, pencil,…) to operate the keypad of the device.

10- AUTOMATIC CALCULATION OF THE CORRECTING FACTOR %

The Percentage Correction Factor described in paragraph 5 can be acquired automatically through the following steps:

1 - Keep the < **UP arrow** > key pressed for at least 2 seconds
2 - The yellow LED flashing and the display shows: < **0. 0 0** >
3 - Carry out the **detection of a known measurement sample** (eg a piece of which you know the exact measure)
The counter detects the pulses generated by the transducer (encoder, ...) and displays the actual measurement taking into account the absolute correcting factor set.
4 - At the end of the survey, press the **RED button**; the display shows: < 0_1 0_2 0_3 0_4. 0_5 0_6 >: 0_6 flashing
5 - Use the <UP arrow> and <DOWN arrow> keys to **set the known measurement of the sample** (eg if the sample measures 12.34 meters, set < 0 1 2. 3 4 >)
6 - Press the **RED button**; the display shows for a few seconds, a message like:
< **X S P P. P** >
where**: P P. P** = calculated value of the percentage correction
S = sign of the calculated value: "0" positive sign or "**-**" negative sign
X = "P"= value correctly calculated
"E" indicates anomaly in the calculation of the factor (too large or too small: not included between + 99.9 and - 99.9); in this case <000.0> is assumed as a correcting factor.
7 - Reset the counter

11- OPERATING CONDITIONS

This device is built in accordance with the European Directive on EMC (2004/108/CE) with regard to arrangements on Electromagnetic Compatibility contained in EN 50081-2, EN 50082-2, EN 61000-4 EN 55011.

PLEASE NOTE: the various devices installation in a system does not imply the system is automatically in accordance to the norms; the designer has to ensure the system is consistent with current regulations.

The device efficiency is achieved by connecting external components (transducers, control signals, ..),the user is responsible for the correct installation.

It is therefore recommended:
- all conductor should conform to the device's voltage and current ratings
- all cabling should conform to appropriate standard of good installation, local code and regulations
- protect the device power supplied by a fuse or circuit breaker
- install the device, the transducers, the control connection and the power supply away from power circuits, transformers, power switch, inverters, and all devices that do not comply with regulations in relating to electromagnetic compatibility
- carry out wiring with cables as short as possible, and shielded in separate housings especially for the connection of transducers and of the serial line RS232

S.C.D. sas disclaims any liability for damage caused by, even partially, the specifications here reported or by any inaccuracies or interpretation.
S.C.D. reserve the right to change, without notice, in whole or in part, the characteristics of this device and the documentation that illustrates the specifications.

Warranty: This equipment is guaranteed for 12 months from the delivery date about the manufacturing defects or defects in the components used. The warranty is void if the unit is tempered without permission or if they are not comply with the installation instructions.

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