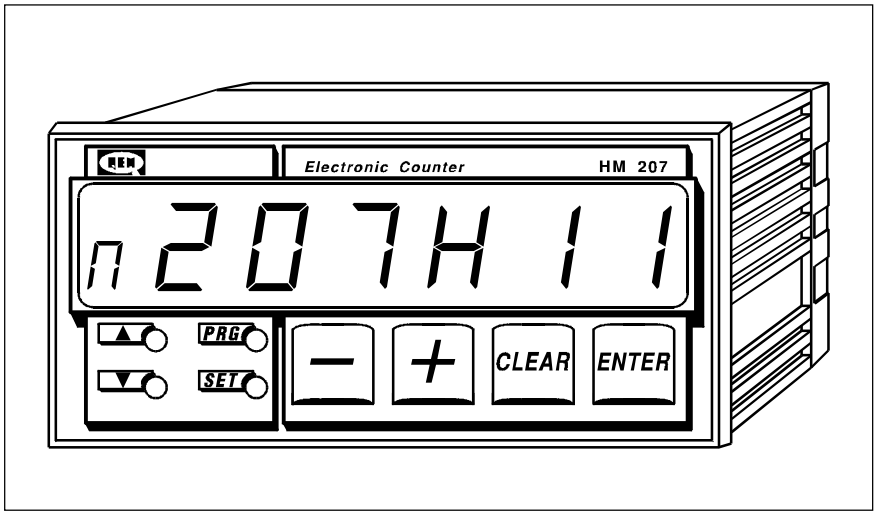
DOUBLE PULSE COUNTER, SINGLE DIRECTION, CONNECTABLE IN RS 232C

HM 207.11

- *Size DIN 48 x 96*
- *6 digits display*
- *2 pulse counter*
- *4 preselections (2 options)*
- *Non volatile memory*
- *Antiscratch membrane keyboard*
- *Extractable polarized terminal board*
- *Expansion of inputs/outputs (opt.)*
- *Expansion RS 232C (option)*
- *Software customizations*



DESCRIPTION OF OPERATION

The instrument HM 207.11 is made of two single direction pulse counters which may be independent or cascade connected between them, with a maximum of two preselections (through an expansion unit you have the possibility to use the twopulse counters in an independent way between them, with two preselections for each pulse counter and to perform a factorization of one of two inputs, with the result available on the instrument's output). You may introduce even 4 descriptive parameters concerning the type of processing you are performing. Through the serial connection RS 232C (option) you can read or write the preselections of the two pulse counters, to perform the monitorizing of the outputs and read or write the descriptive parameters of the type of processing which you are performing. The keyboard, in antiscratch polycarbonate, is performed with mechanical actuators which provide the operator with the touch sensation of the key. The count, preselections and parameters of operation are stored in a non volatile memory, to guarantee maximum reliability and safety of operation even in extreme conditions.

CE

This product is an electronic instrument and is thus not to be considered as a machine. Consequently, it is not subject to the requirements stated in EEC Directive 89/392 (Machines Directive). It is hereby specified that, if the QEM instrument is used as a component part of a machine, it must not be switched on if the machine does not comply with the Machines Directive.

The instrument mark does not absolve the Customer fromthe fulfilment of his or her legal obligations regarding the finished product.

The catalogue describes the operation instructions of the product and it is not liable about the instrument's operation

KEYBOARD DESCRIPTION		
ENTER	**Green**	It confirms the data entering When pressed with the key (-) + PASSWORD you access to the SET-UP parameters If pressed for 2 seconds it provides the access to the preselections During the setting of the preselections it displays the following one
CLEAR	**Red**	Under data entering, it sets to zero the data displayed If pressed for 2 seconds it sets to zero the count of the displayed pulse counter (enabled by the parameter "Function key CLEAR" in SET-UP)
+	**Black**	Under data entering, it increase impulsively or in a continuous way the selected digit (the blinking one) When pressed immediately it displays as a sequence the pulse counter 1 and 2 (if enabled) When pressed for 2 seconds it displays the status of the inputs and outputs
—	**Black**	Under dat aentering it moves to the right the selection of the digit When pressed with the key ENTER + PASSWORD you access to the SET-UP parameters When pressed for 2 seconds it provides the access to the production data
PRG	**Led prg**	It is ON during the programming of the SET-UP parameters
SET	**Led set**	It is ON during the programming of the preselections and of production data
▲	**Led**	It is ON when you activate the output U1
▼	**Led**	It is On when you activate the output U2 (if there is the expansion it is ON with the activation of the output U3).
● 8	**Led lcf**	It is On when it is displayed the pulse counter 2

DESCRIPTION OF INPUTS			
NAme	**Signal**	**Activat. Input**	**Description**
I1	**I**	**ON**	**CLOCK 1.** Input of count in the pulse counter 1 (the counter is increased on the upwards or downwards descent front according to the SET-UP parameter "Increment Front of count for input I1"). **N.B.** The frequency of input of I1+I2 may arrive up to 10 Khz but to obtain a good efficiency of thekeyboard and a good performance of the display we recommend that the frequencies of I1+I2 do not exceed 5 Khz. In any case for high frequencies we recommend to exclude the filter on the interferences U, O, U, O (set-up).
I2	**I**	**ON**	**CLOCK 2.** Input of count in the pulse counter 2 (the counter is increased on the upwards or downwards descent front according to the SET-UP parameter "Increment Front of count for input I2"). **N.B.** The frequency of input of I1+I2 may arrive up to 10 Khz but to obtain a good efficiency of thekeyboard and a good performance of the display we recommend that the frequencies of I1+I2 do not exceed 5 Khz. In any case for high frequencies we recommend to exclude the filter on the interferences U, O, U, O (set-up).
I3	**C**	**ON**	**STOP 1.** Input which stops the count of the two pulse counters (with the SET-UP parameters "Choice of the block for the external count of the pulse counter 2"=1 it stops only the pulse counter 1).
I4	**I**	**ON**	**RESET 1.** Input to zet to zero the counts (enabled only with the SET-UP parameters "Setting to zero the pulse counter 1" and "Setting to zero the pulse counter 2"= 0,2. If there is the expansion it sets to zero only the pulse counter 1). If the parameter "FS" (printer operation mode) it is set to 0 or 2 the activation of the input also starts the print of the data selected in the parameter "dS" (printing data).
I=Impulsive input **C**=Continuous Input			

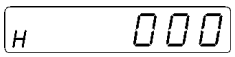
DESCRIPTION OF THE INPUTS USED WITH THE EXPANSION (ORDERING CODE "E")			
Name	**Signal**	**Input Activat.**	**Description**
I5	**C**	**ON**	**STOP 2.** Input to stop the count of the pulse counter 2 (only if the parameter of SET-UP "Choice of block for the external count of the pulse counter 2"=1)
I6	**I**	**ON**	**RESET 2.** Input to set to zero the pusle counter 2 (enabled only with the SET-UP parameter "Set to zero the pulse counter 2 with expansion"=0,2)
I=Impulsive Input **C**=Continuous Input			

DESCRIPTION OF OUTPUTS			
Name	**Signal**	**Input Activat.**	**Description**
U1	**I / C**	**Par. t1**	**OUTPUT OF PRESELECTION A.** It is activated when the count of the pulse counter 1 reaches the value of the preselection **A**
U2	**I / C**	**Par. t2**	**OUTPUT OF PRESELECTION B, (A-B) or C.** It is activated when the count of the pulse counter 1 reaches the values of the preselection **B** or (**A**-**B**) if the parameter of SET-UP "Output U2"=0 or 1. If the parameter of SET-UP "Output U2"=2 is activated whenthe count of the pulse counter 2 reaches the value of the preselection **C**
I=Impulsive output **C**=Continuous output			

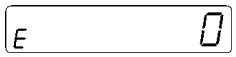
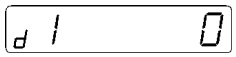
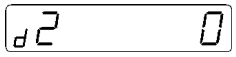
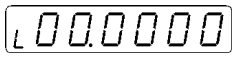
DESCRIPTION OF THE OUTPUTS USED WITH THE EXPANSION (ORDERING CODE "E")			
Name	**Signal**	**Input Activat.**	**Description**
U3	**I / C**	**Par. t3**	**OUTPUT OF PRESELECTION C.** It is activated when the count of the pulse counter 2 reaches the value of the preselection **C**
U4	**I / C**	**Par. t4**	**OUTPUT OF PRESELECTION D.** It is activated when the count of the pulse counter 2 reaches the value of the preselection **D** or (**C**-**D**)
U5	**I**	**Par. t5**	**OUTPUT FACTORIZER.** Output in frequency obtained by the factorization (parameter of SET-UP "Multiplicative coefficient of the pulse counter 2")of the input I1 or I2
I=Impulsive output **C**=Continuous output			

ENTERING THE SET-UP PARAMETERS

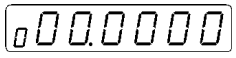
To access to the programming of the following parameters we have forecast to enter a 3 digits code as follows:

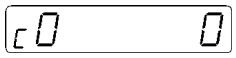
- Press at the same time the keys [—] + [ENTER] for 1 second
- On the display appears  which is the request of the access code
- Enter with the keys (**+**) and (**-**) the value 207 and confirm with [ENTER] ; this led goes ON PRG

(At the end of the entering of each function press **ENTER** to confirm and pass to the following function)

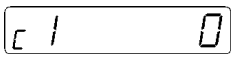
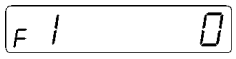
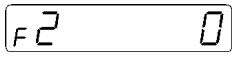
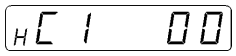
FUNCTION	DISPLAY	DESCRIPTION
Introduction of the expansion		**0**= Expansion of inputs/outputs not installed (option "E") **1**= Expansion of inputs/outputs installed (option "E")
Decimal digits of pulse counter 1		**0**= Maximum display is 999999 **1**= Maximum display is 99999,9 **2**= Maximum display is 9999,99 **3**= Maximum display is 999,999
Decimal digits of pulse counter 2		**0**= Maximum display is 999999 **1**= Maximum display is 99999,9 **2**= Maximum display is 9999,99 **3**= Maximum display is 999,999
Multiplicative coefficient of the pulse counter 1		The impulses on input I1 are multiplied by this coefficient in order to adapt the displayings and the preselections of the pulse counter 1 to the desired unit of measure (00,0005÷40,0000)
Multiplicative coefficient of the pulse counter 2		The impulses on input I1 or those oninput I2 (choice according to the parameter "Choice of the input of the multiplicative coefficient in the pulse counter 2") are multiplied by this coefficient in order to adapt the displayings (and the preselections with the internal unit of expansion) of the pulse counter 2 to the desired unit of measure (00,0005÷40,0000)

If the parameter "Expansion introduction"=1 also this displaying appears

Factorization Coefficient		It is valid only if there is the expansion unit. The impulses on input I1 or those on input I2 (choice according to the parameter "Choice of input of factorization coefficient") are multiplied by this coefficient in order to provide in output U5 a frequency which is fit for the use to be made by the customer

FUNCTION	DISPLAY	DESCRIPTION
Choice of input multiplicative coefficient of the pulse counter 2		**0**= The multiplying coefficient 2 will adapt the impulses on input I1 **1**= The multiplying coefficient 2 will adapt the impulses on input I2

If the parameter "Expansion Introduction"=1 also this displaying appears

Choice of input of factorization coefficient		**0**= The coefficient of factorization shall fit the impulses of the input I1 **1**= The coefficient of factorization shall fit the impulses of the input I2
Front of increment for calculation of input I1		**0**= The calculation is increased by de-activating the input I1 **1**= The calculation is increased by activating the input I1
Front of increment for calculation of input I2		**0**= The calculation is increased by de-activating the input I2 **1**= The calculation is increased by activating the input I2
Number of checks on clock 1		It determines the number of verifications which are performed when reading the input of clock 1 to the purpose of ocnsidering as valid the signal. Each verification corresponds to a testing time of a millisecond so that by setting HC1=10 we have a testing time of 10 milliseconds, be it for activation and for de-activation of the input. The maximum frequency shall be then 50 Hz [F max.=1 / (2 ×0,010)] for a signal having 50% of duty cycle. By setting the value "00" the maximum count frequency is 10 Khz and you must set the following parameters of "Minimum time of activation in input I1" and "Minimum time of de-activation in input I1".

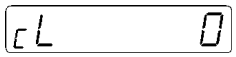
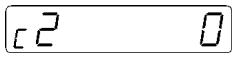
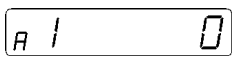
If the parameter "Number of checks clock 1"=0 also these displayings appear

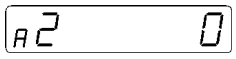
Minimum time of activation input I1		It is the minimum time for the activation of input I1 in order that the activation is considered as valid for the count. By setting zero value, the check is disabled and then all impulses are considered as valid for the count. **N.B.** This value may be empirically obtained as described in the procedure for the calibration of the pulse counter on page 21.
Minimum time of de-activation input I1		It is the minimum time for the de-activation of input I1 in order that the de-activation is considered as valid for the count. By setting zero value, the check is disabled and then all impulses are considered as valid for the count. **N.B.** This value may be empirically obtained as described in the procedure for the calibration of the pulse counter on page 21.

FUNCTION	DISPLAY	DESCRIPTION
Number of checks of clock 2		It determines the number of verifications which are performed when reading the input of clock 2 to the purpose of considering as valid the signal. Each verification corresponds to a testing time of a millisecond so that by setting HC2=10 we have a testing time of 10 milliseconds, be it for activation and for de-activation of the input. The maximum frequency shall be then 50 Hz [F max.=1 / (2 ×0,010)] for a signal having 50% of duty cycle. By setting the value "00" the maximum count frequency is 10 Khz and you must set the following parameters of "Minimum time of activation in input I2" and "Minimum time of de-activation in input I2".

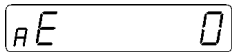
If the parameter "Number of checks of clock 2"=0 also these displayings appear

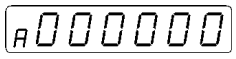
Minimum time of activation input I2		It is the minimum time for the activation of input I2 in order that the activation is considered as valid for the count. By setting zero value, the check is disabled and then all impulses are considered as valid for the count. **N.B.** This value may be empirically obtained as described in the procedure for the calibration of the pulse counter on page 21.
Minimum time of de-activation input I2		It is the minimum time for the de-activation of input I2 in order that the de-activation is considered as valid for the count. By setting zero value, the check is disabled and then all impulses are considered as valid for the count. **N.B.** This value may be empirically obtained as described in the procedure for the calibration of the pulse counter on page 21.

Function of key **CLEAR**		**0**= No function **1**= Pressed for 2 seconds it sets to zero the pulse counter 1 **2**= Pressed for 2 seconds it sets to zero the pulse counter 2 **3**= Pressed for 2 seconds it sets to zero both the pulse counters **4**= Pressed for 2 seconds it sets to zero only the pulse counter displayed
Input of impulses to the pulse counter 2		**0**= Pulse counter disabled **1**= Count from impulses being on input I1 or I2 ("Choice of input of multiplicative coefficient in pulse counter 2") **2**= Count from activation of output U1
Setting to zero the pulse counter 1		**0**= The pulse counter 1 is set to zero by activating the input I4 **1**= Thepulse counter 1 is set to zero only by activating the output U1 **2**= Thepulse counter 1 is set to zero be it by activating the input I4, be it by activating output U1 **3**= The pulse counter 1 is set to zero ponly with the key CLEAR (if enabled by the parameter "Function of key CLEAR")

FUNCTION	DISPLAY	DESCRPTION
Setting to zero the pulse counter 2		**0**= The pulse counter 2 is set to zero by activating the input I4 **1**= The pulse counter 2 is set to zero only by activating the output U2 **2**= The pulse counter 2 is set to zero be it by activating the input I4, be it by activating output U2 **3**= The pulse counter 2 is set to zero ponly with the key CLEAR (if enabled by the parameter "Function of key CLEAR")

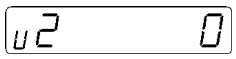
If the parameter "Expansion Introduction"=1 also this displaying appears

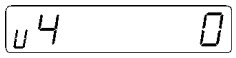
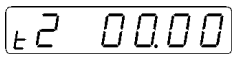
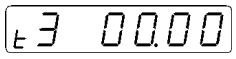
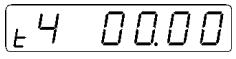
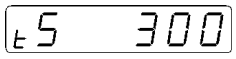
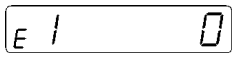
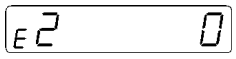
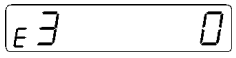
Setting to zero the pulse counter 2 with expansion		**0**= The pulse counter 2 is set to zero by activating the input I6 **1**= The pulse counter 2 is set to zero only by activating the output U3 **2**= The pulse counter 2 is set to zero be it by activating the input I6 be it by activating output U3

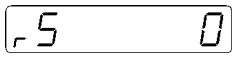
Preselection **A**		With **A**=0, the preselection shall be accessible to the operator through the key ENTER (preselection **A** external). With **A**>0, the preselection shall be equal to the value set and it shall not be acccessible to the operator but only to the installer in SET-UP
Preselection **b**		With **b**=0, the preselection shall be accessible to the operator through the key ENTER (preselection **b** external). With **b**>0, the preselection shall be equal to the value set and it shall not be acccessible to the operator but only to the installer in SET-UP
Preselection **C**		With **C**=0, the preselection shall be accessible to the operator through the key ENTER (preselection **C** external). With **C**>0, the preselection shall be equal to the value set and it shall not be acccessible to the operator but only to the installer in SET-UP

If the parameter "Expansion Introduction"=1 also this displaying appears

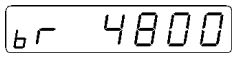
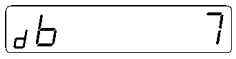
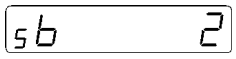
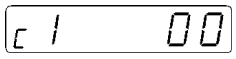
Preselection **d**		With **d**=0, the preselection shall be accessible to the operator through the key ENTER (preselection **d** external). With **d**>0, the preselection shall be equal to the value set and it shall not be acccessible to the operator but only to the installer in SET-UP

Output U2		**0**= The output U2 is activated when reaching the preselection **b** of the pulse counter 1 **1**= The output U2 is activated when reaching the preselection **A**-**b** (the preselection **A** indicates the level to be reached through the preselection **b** the level of pre-speed reduction) of the pulse counter 1 **2**= The output U2 is activated when reaching the preselection C of the pulse counter 2

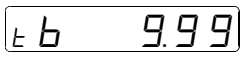
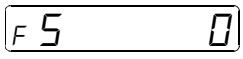
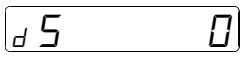
FUNCTION	DISPLAY	DESCRIPTION
Se il parametro "Inserzione espansione"=1 è presente anche questa visualizzazione		
Output U4		**0**= The output U4 is activated when reaching the preselection **d** of the pulse counter 2 **1**= The output U4 is activated when reaching the preselection **C-d** (the preselection **C** indicates the level to be reached while the preselection **d** the level of pre-speed reduction) of the pulse counter 2
Timer output U1		With **t1**=0, the output U1 remains activated up to the zero reset of the pulse counter 1. With **t1**>0, the output U1 remains activated for the time which has been set (seconds)
Timer output U2		With **t2**=0 if the parameter "Output U2"=0 or 1, the output U2 remains activated until the zero reset of the pulse counter 1 (if the parameter "Output U2")=2 the output U2 remains activated until the zero setting of the pulse counter 2). With **t2**>0, the output U2 remains activated for the time which has been set (seconds)
If the parameter "Expansion Introduction"=1 also this displaying appears		
Timer output U3		With **t3**=0, the output U3 remains activated until the zero setting of the pulse counter 2. With **t3**>0, l'uscita U3 remains activated for the time which has been set (seconds)
Timer output U4		With **t4**=0, the output U4 remains activated until the zero setting of the pulse counter 2. With **t4**>0, the output U4 remains activated for the time which has been set (seconds)
Timer output U5		Activation time of output U5 used as factorizator (min. 5 ms., max. 300 ms.). With **t5**=0, the factorizator is disabled.
Block of countin the pulse counter 1		**0**= The count is free **1**= The count is blocked at the moment of the activation of output U1 and it is disabled with the zero reset of the pulse counter 1
Block of countin the pulse counter 2		**0**= The count is free **1**= The count is blocked at the moment of the activation of output U2 and it is disabled with the zero reset of the pulse counter 2 **2**= The count is blocked at the moment of the activation of output U3 (valid only if there is the expansion unit) and it is disabled with the zero reset of the pulse counter 2
Choice of block from external control of pulse counter 2		**0**= The count of the pulse counter 2 is blocked by activating the input I3 **1**= The count of the pulse counter 2 is blocked by activating the input I5 (available only if there is the expansion unit)

FUNZIONE	DISPLAY	DESCRIZIONE
Enabling RS-232C		**0**= Transmission RS-232C disabled. It is not used the option for the transmission RS 232C (ordering code RS) **1**= Transmission RS-232C enabled **2**= Transmission RS-232C enabled for the printer alfapanel

If the parameter "Enabling RS-232C"=1 also these displayings appear

Speed transmissions RS-232-C		110 baud 150 baud 300 baud 600 baud 1200 baud 2400 baud 4800 baud Available speed transmissions; if the speed is wrong thedefault is 4800
Number of data bits		**7 bits** **8 bits** Numero of available data bits; if the number of bits is wrong the default is 8
Number of stop bits		**1 bit di stop** **2 bit di stop** Numero of available stop bits; if the number of bits is wrong the default is 2
Address code		It is the code you must assign to the unit if you wish to connect the instrument to others instruments in DAISY-CHAIN configuration. If it is set to zero, each command shall be taken into consideration and then it is not necessary to send the address code.

If the parameter "Enabling RS-232C"=2 also these displayings appear

Time of busy		It is the busy time to send a string to the printer (max. 9,99 seconds)
Printer operation mode		**0**= The print is made only upon activation of input I4 **1**= The print is made only when pressing the key **CLEAR** (if enabled) **2**= The print is made be it upon activation of input I4 be it when pressing the key **CLEAR** (if enabled) **N.B.** The key **CLEAR** controls the print only if it sets to zero the pulse counter 1
Data in print		**0**= It is printed the count reached by the pulse counter 1 **1**= It is printed the count reached by the pulse counter 1 and the preselection A **2**= It is printed the count reached by the pulse counter 2 **3**= It is printed the count reached by the pulse counter 2 and the preselection C **4**= It is printed the count reached by the pulse counter 1 and 2 **5**= It is printed the count reached by the pulse counter 1 and 2 and teir preselection

FUNCTION	DISPLAY	DESCRIPTION
Print mode	nS 0	**0**= Normal print **1**= Double width print **2**= Double height print **3**= Expanded print (double width + double height)
Display time	tu 60.0	It is the time during which the data printed remains displayed upon the activation of input I4 (max. 60,0 seconds)
Print date and time	Sdo 1	**0**=Printing of date and time not allowed. **1**=Printing of date and time allowed.
Once the programming of the last function is achieved, there returns the display in use before entering the SET-UP and the led prg goes OFF		

ENTERING THE PRESELECTIONS

The instrument is equipped with 2 preselections (4 of them with an expansion unit) which may be fully or partially programmed by the user. The preselections are called **A**, **B**, **C**, (**D**) and are made programmable to the user if in SET-UP you enter the value 0 to the corresponding function.

To enter the preselections operate as follows:

Press the key ENTER ; this led goes ON SET and on the display appears:

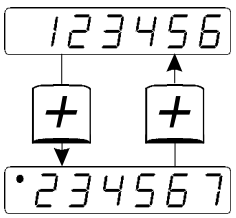
A234567 (↑ Cifra lampeggiante) Preselection **A**. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position. Upon confirmation with **ENTER** of the value which has been set the display shows:

b894567 Preselection **b**. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position. Upon confirmation with **ENTER** of the value which has been set the display shows:

C564187 Preselection **C**. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position.

Upon confirmation with **ENTER** of the preselection **C**, if there is the expansion unit, the display shows the preselection **d**:

d689157 Preselection **d**. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position. Upon confirmation with **ENTER** of the value which has been set the display shows:



Pulse counter 1

Pulse counter 2 only if it is enabled tooperate (function C2≠0)

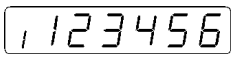
N.B. If the operator has programmed a parameter of SET-UP concerning the preselections (example **C**) greater than zero, during the introduction of the preselections after the confirmation of the preselection **b** there shall be proposed the preselection **d** because the value of the preselection **C** is individual and it has already been fixed by the installer. **If for instance you have programmed a preselection being=50, and a multiplicative coefficient≠1, the related output is activated upon the value: preselection - an impulse of clock**

ENTERING THE PRODUCTION DATA

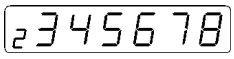
This instrument provides the possibility to enter 4 data made up of 6 digits, which describe the type of production which you are performing (example: n. of order, n. of customer, etc.). These data may be read or written through the serial connection RS 232C (option)

To enter the data operate as follows:

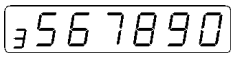
Press the key [—] for 2 seconds; this led goes ON SET and on the display appears:



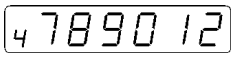
Data 1. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position. Upon confirmation with **ENTER** of the value which has been set the display shows:



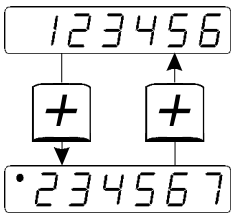
Data 2. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position. Upon confirmation with **ENTER** of the value which has been set the display shows:



Data 3. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position. Upon confirmation with **ENTER** of the value which has been set the display shows:



Data 4. By using the key (**+**) the operator may increase by one position the blinking digit. By operating on the key (**-**) the blinking digit is shifted to the right by one position. Upon confirmation with **ENTER** of the value which has been set the display shows:



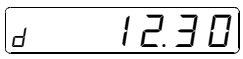
Pulse counter 1

Pulse counter 2 only if it is enabled tooperate (function C2≠0)

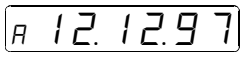
CLOCK PROGRAMMING

If in set-up the parameter Sdo = 1, it is possible to program date and time as follows.

Press keys [+] and [—] for 3seconds; display shows:

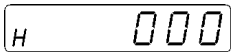


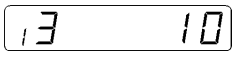
By pressing keys (**+**) and (**-**) the operator can introduce hours and minutes to be printed. By confirming with ENTER the display shows:

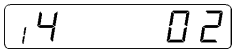


By pressing keys (**+**) and (**-**) the operator can introduce day, month and year to be printed. Confirming with ENTER the clock will be updated with the new values.

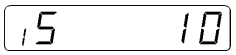
ENTERING THE NUMBER OF CHECKS OF INPUTS I3, I4, I5, I6

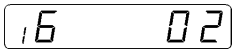
- Press at the same time the keys [—] + [ENTER] for 1 second
- On the display appears  which is the request for th eaccess code
- Enter with the keys (**+**) and (**-**) the value 702 and confirm with [ENTER] ; this led goes ON PRG and on the display appears:

 Through the keys "**+**" and "**-**" the operator may enter the number of checks for the input I3. If you set zero, the instrument defaults to "10". Upon confirmation with **ENTER** of the value which has been set, the display shows:

 Through the keys "**+**" and "**-**" the operator may enter the number of checks for the input I4. If you set zero, the instrument defaults to "2". Upon confirmation with **ENTER** of the value which has been set, the display shows:

If the parameter of set-up "Expansion introduction"=1 also the following introductions shall appear.

 Through the keys "**+**" and "**-**" the operator may enter the number of checks for the input I5. If you set zero, the instrument defaults to "10". Upon confirmation with **ENTER** of the value which has been set, the display shows:

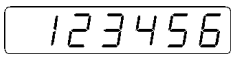
 Through the keys "**+**" and "**-**" the operator may enter the number of checks for the input I6. If you set zero, the instrument defaults to "2". Upon confirmation with **ENTER** of the value which has been set, the display shows:

Once the introduction of the number of verifications is achieved, the display shows again the displayings in use. This led PRG goes OFF.

N.B. Each check corresponds to a testing time of 5 milliseconds. By setting 10 checks we have a test of 50 milliseconds, be it for the activation and de-activation of the input.

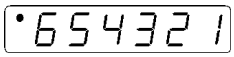
DISPLAYS

During normal operation the display shows:



Count of pulse counter 1

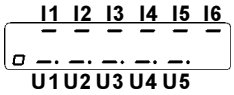
Pressing quickly the key [+], the display shows:



Count of the pulse counter 2 if it is enabled (parameter "Inputof impulses to the counter 2"¹0)

Pressing quickly the key [+], the display shows again the count of the pulse counter 1

Pressing the key [+] for 2 seconds apx. the display shows:



The display shows the status of the inputs and outputs. This led _ ON indicates the activation of the input or output

Pressing any key the display shows again the current displayings in use

PRINTER DISPLAYS

These displays depend upon the set-up parameter "Print data".

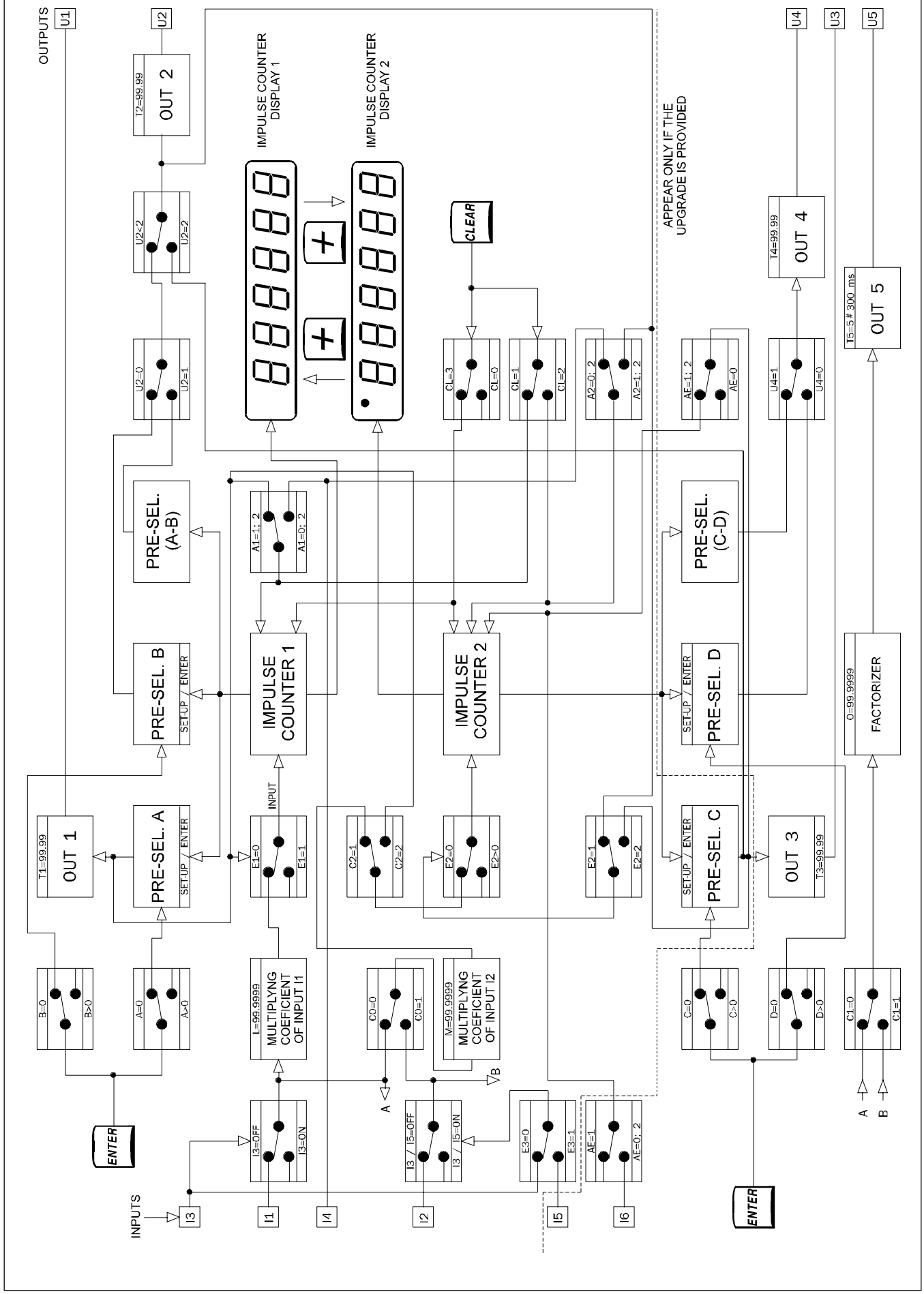
C1_123456
P1_123456
C2_123456
P2_123456

Space

DESCRIPTION OF THE FUNCTIONAL SCHEME BY BLOCKS

If the input I3=OFF the count of input I1 scrolls in the direction of the pulse counter 1; the function E1=1 avoids the count once the preselection **A** has been reached, while the function E1=0 makes the count to continue independentely from the status of output U1. The pulse counter 2 receives the count impulses from input I1 (if C0=0), from input I2 (se C2=1) or from output U1 of the pulse counter 1 (if C2=0). The function A1 controls the zero reset of the pulse counter 1 and the function A2 controls the zero reset of the pulse counter 2; the function E2=1 avoids the count of the pulse counter 2 once the preselection **b** (or **A-b**) has been reached while the function E1=0 makes the count to continue independentely from the status of output U2. Bi introducing the expansion unit you duplicate the two pulse counters; if the input I5=OFF and the function E3=1 the count of input I2 scrolls in the direction of the pulse counter 2; the function E2=2 avoids the count of the pulse counter 2 once the preselection C has been reached; the function AE controls the zero reset of the pulse counter 2. The function C1=0 allows to obtain in output U5 the factorized value of input I1 while the function C1=1 allows to obtain in output U5 the value factorized bu the input I2. The key **ENTER** according to the funcitons **A**, **b**, **C**, **d** allows to make accessible to the operator the preselections while the key **CLEAR** allows the zero reset of one or both the pulse counters. The key (**+**) allows to change the displayings of the two pulse counters.

DIAGRAM OF FUNCTIONAL BLOCKS



COMMANDS IN RS 232-C

If there is on the instrument the option RS 232-C and in set-up it is enabled the transmission, it is possible to transmit from a PC some reading and writing commands. Each string of command sent to the PC, must always start with the character "{" (ascii value=123). The first 2 characters of transmission opening or of single command which are sent, must be numerical, because they represent the address code to which is destinated the message or from which an information is arriving. If the address "00" i ssent, it means that the information is destinated to all instruments in line. The following 2 characters must be 2 capital letters because they identify the operating code of the instruction. After the operating code there is the operand, i.e. the numeric value of the variable concerned by the operating code. The characters sent without placing before the character "{" and at the end the character "@" are only re-transmitted as an "ECHO" effect but nothing is performed by the instrument receiving them. Each string sent by the instrument must start with the character "[" (ascii value=91). The instrument i salways slave and may transmit only upon request from the PC (master).

N.B. The commands enabled are those described inside the cases

Synthaxis of general command

{ XX YY XXX @

- Character of end of string.
- Address by 3 digits with the first letter of command code being=M or T. It becomes a numeric or alphanumeric data of variable length with the other command codes.
- Command code (two letters). The first letter identifies the type of data to be transmitted (table, message, set-point). The second letter identifies the type of command (opening, closing, request ...).
- Address code. It identifies the instrument in transmission / reception. It may be omitted if a erial connection with several instruments is not forecast.
- Code of start of transmission string from PC ({ , **(**).
  The character of transmission string start of the instrument is "[".

It shows the string which is usable in the transmission. The empty string indicates that the command is not implemented in the instrument.

Command code letter "T":

{ XX TY XXX @

- Number of numeric table to be opened
- **A**=Opening of a numeric table

{	0	0	T	A	0	0	1	@

Nº tables:
001=Preselections
002=Counters
003=Product. data

Writing operation in the instrument's memory:

(XXX XXXXX ... @

- Numerical series transmitted (1234,55..). Here are accepted various numeric values which are identified by the instrument and automatically separated; then each value must have a fixed size.
- Address of the data corresponding to the open table

(	0	0	1	1	2	3	4	5	6	@

Nº indirizzi tabella preselezione:
001=Preselection **A**
002=Preselection**b**
003=Preselection**C** With expansion
004=Preselection**d**
Nº addresses of table counters:
001=Counter 1
002=Counter 2
Nº indirizzi dati di produzione:
001=Data 1
002=Data2
003=Data3
004=Data4

{ XX TY XXX @

{	0	0	T	C	0	0	1	@

- Number of table to be closed
- **C**=Closing of the table

{ XX TY XXX @

{	0	0	T	?	0	0	1	@

- Number of numeric table required
- **?**=Reading request of table from instrument to PC

Request fot pre-selection reading

[TY XXX @

[	T	A	0	0	1	@

- Number of numeric table to be transmitted
- **A**=Opening of a numeric table

Writing operation in the PC's memory:

[XXX XXXXX ... @

[	0	0	1	1	2	3	4	5	6	@

- Transmitted value(1234,55..)
- Address of the data corresponding to the transmitted table

[TY XXXXX ... @

[	T	C	0	0	1	@

- Number of table to be closed
- **C**=Closing of the table

Command code letter "M":

{ XX MY XXX @

- Number of alphanumeric table (messages) to be opened
- **A**=Opening an alphanumeric table (messages)

Writing operation in the instrument's memory:

(XXX XXXXX ... @

- Alphanumeric code transmitted (ALUF e C 67 AS ...)
- Address of the data corresponding to the table

{ XX MY XXX @

- Number of table to be closed
- **C**=Closing of the alphanumeric table

{ XX MY XXX @

- Nuber of alphanumeric table required
- **?**=Reading request of table from instrument to PC

[MY XXX @

- Number of alphanumeric table to be transmitted to the PC
- **A**=Opening an alphanumeric table

Writing operation in the PC's memory:

[XXX XXXXX ... @

- Alphanumeric code transmitted (CRS IDEA 1 ...)
- Address of the alphanumeric table transmitted

[MY XXX @

- Number of tables to be closed
- **C**=Closing the table transmission

Command code letter "S":

Writing operation in the instrument's memory:

{ XX SY XXX ... @

- Numerical series transmitted (123,5345,7)
- **V**=The following characters are not an address but a numeric series. the lette (any) identifies the transmitted variable.

{ XX SY @

{	**0**	**0**	**S**	**?**	**@**

- **?**=Reading request of the PC to the instrument of the numeric series. The instrument shall transmit all the variables.

Writing operation in the PC's memory:

[Y XXXXX ... @

	U1	U2	U3	U4	U5				
[	**V**	**0**	**0**	**0**	**1**	**1**	**@**				

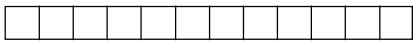
- Numerical series transmitted (123,5345,7). Max. 32 characters
- **V**=The letter identifies the variable transmitted

The data of response identifies the status of the related output

Command code letter "P":

Writing operation in the instrument's memory:

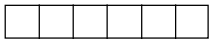
{ XX PY XXX ... @



→ Alphanumeric series transmitted (ABC,5*ER9,7). Max. 32 characters

→ **V**=The following characters are not an address but an alphanumeric series

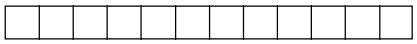
{ XX PY @



→ **?**=Reading request from the PC to the instrument about the alphanumeric series

Writing operation in the PC's memory:

[XXXXX ... @

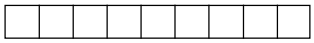


→ Alphanumeric series transmitted by the instrument. Max. 32 characters

Command code letter "C":

Used in the on line commands

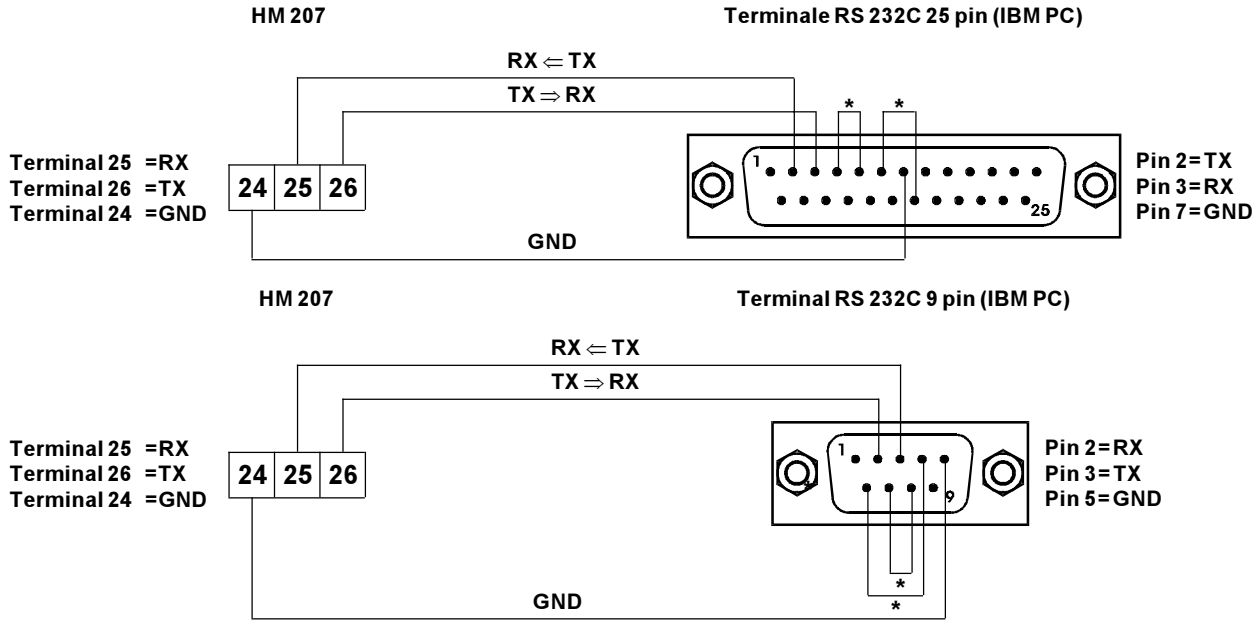
{ XX CY XXX @



→ Number of command code made of a letter followed by two numbers

→ **E**=The following characters are not an address but a letter followed by two numbers

CONNECTIONS OF SERIAL INTERFACE (RS 232C)



* Only if required by the PC's software

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CALIBRATION OF PULSE COUNTER 1

To make easier the installation, when entering the set-up values which determine the count of the pulse counter 1, it is possible to display the count, the minimum time of activation and the minimum time of de-activation by operating as follows:

- Press at the same time the keys [—] + [ENTER] for apx. 1 second
- On the display appears [H 000] which is the request of the access code
- Enter with the keys (+) and (-) the value 456 and confirm with [ENTER] ; on the display appears

[I 1234] Count of pulse counter 1

To reset to zero the count press the key [—]

By pressing the key [+] , the display shows:

[u 1.00000] Minimum time of activation input I1

By pressing the key [+] , the display shows:

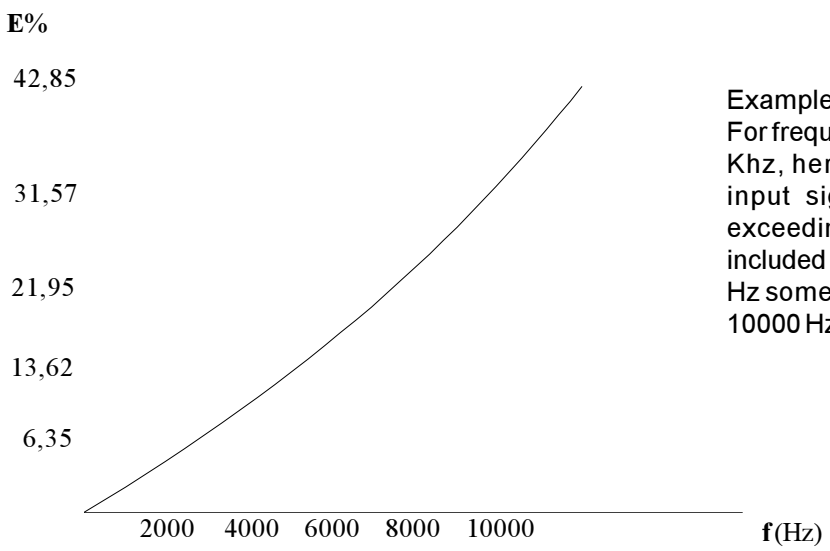
[o 1.00000] Minimum time of de-activation input I1

By pressing the key [+] , the display shows again:

[I 1234] Count of pulse counter 1

To exit press the key [CLEAR]

In order to obtain a correct count it is necessary to define the parameters of minimum time of activation and de-activation. To determine the minimum times of activation and de-activation (minimum 50 micro seconds) which are sent by the transducer, you only need to bring the transducer to maximum speed and, under tachometer calibration (key -)+(ENTER)+(Password 456) read the values of minimum time of activation and de-activation which the instrument displays. These values shall be entered in set-up in the parameters "minimum time of activation" and "minimum time of de-activation". The values of minimum times of activation and de-activation lower than those which were set in set-up, shall not be considered as valid for the count with maximum tolerance being 42.85% at a frequency of 10KHz as indicated in the diagram here below:



Example:
For frequencies of calculation of 10 Khz, here are not calculated the input signals with frequencies exceeding 14285 Hz. In the range included between 10000 and 14285 Hz some impulses are lost. Under 10000 Hz all impulses are counted.

CALIBRATION OF PULSE COUNTER 2

To make easier the installation, when entering the set-up values which determine the count of the pulse counter 2, it is possible to display the count, the minimum time of activation and the minimum time of de-activation by operating as follows:

- Press at the same time the keys [—] + [ENTER] for apx. 1 second
- On the display appears [H 000] which is the request of the access code
- Enter with the keys (+) and (-) the value 654 and confirm with [ENTER] ; on the display appears

[I 1234] Count of pulse counter 2

To reset to zero the count press the key [—]

By pressing the key [+] , the display shows:

[u 1.00000] Minimum time of activation input I2

By pressing the key [+] , the display shows:

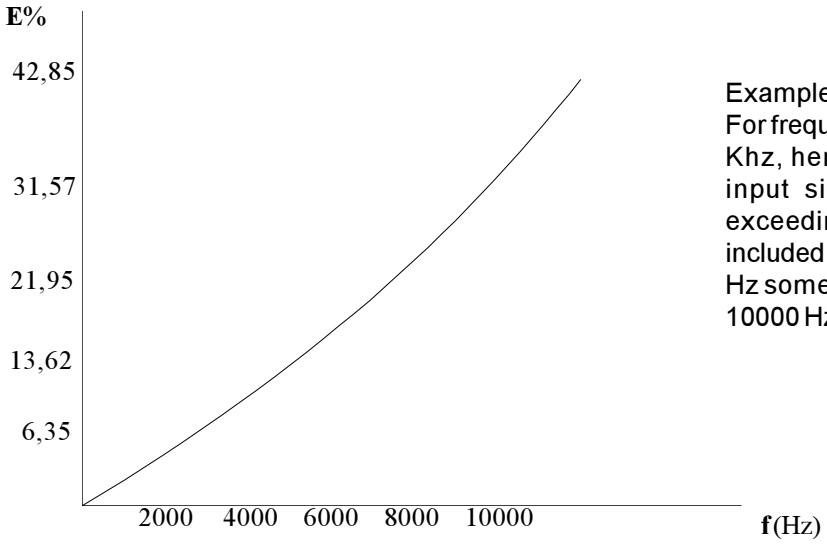
[o 1.00000] Minimum time of de-activation input I2

By pressing the key [+] , the display shows again:

[I 1234] Count of pulse counter 2

To exit press the key [CLEAR]

In order to obtain a correct count it is necessary to define the parameters of minimum time of activation and de-activation. To determine the minimum times of activation and de-activation (minimum 50 micro seconds) which are sent by the transducer, you only need to bring the transducer to maximum speed and, under tachometer calibration (key -)+(ENTER)+(Password 654) read the values of minimum time of activation and de-activation which the instrument displays. These values shall be entered in set-up in the parameters "minimum time of activation" and "minimum time of de-activation". The values of minimum times of activation and de-activation lower than those which were set in set-up, shall not be considered as valid for the count with maximum tolerance being 42.85% at a frequency of 10KHz as indicated in the diagram here below:



Example:
For frequencies of calculation of 10 Khz, here are not calculated the input signals with frequencies exceeding 14285 Hz. In the range included between 10000 and 14285 Hz some impulses are lost. Under 10000 Hz all impulses are counted.

ELECTRIC CONNECTIONS OF INPUTS AND OUTPUTS

1	**+**	Positive of transducer's power supply 12 V 100 mA
2	**-**	Negattive of transducer's power supply
3	**P1**	Terminal of poalrization of inputs I1÷I4 (**+** NPN, **-** PNP)
4	**I1**	(I) Clock 1
5	**I2**	(I) Clock 2
6	**I3**	(C) Stop 1
7	**I4**	(I) Reset 1
8	**C1**	Terminal of polarization of outputs U1-U2 (+ PNP, - NPN)
9	**U1**	(I / C) Output of preselection **A**
10	**U2**	(I / C) Output of preselection **B** (or **A**-**B**)
11	**GND**	Ground connection (we recommend a conductor having ϕ 4 mm.)
12	**XXX**	Power supply voltage Vac ±15% 50 / 60 Hz
13	**XXX**	Power supply voltage Vac ±15% 50 / 60 Hz

14	**P2**	Terminal of polarization of inputs I5-I6 (+ NPN, - PNP)
15	**I5**	(C) Stop 2
16	**I6**	(I) Reset 2
17	**C2**	Terminal of polarization of outputs U3, U4, U5 (**+** PNP, **-** NPN)
18	**U3**	(I / C) Output of preselection **C**
19	**U4**	(I / C) Output of preselection **D** (o **C**-**D**)
20	**U5**	(I / C) Output factorizer
21	**GND**	Common of analog outputs
22	**AN1**	Not used
23	**AN2**	Not used
24	**GND**	Common of the serial port
25	**RX**	Reception RS 232C (option)
26	**TX**	Transmission RS 232C (option)

GENERAL CHARACTERISTICS OF CONNECTIONS

INPUTS

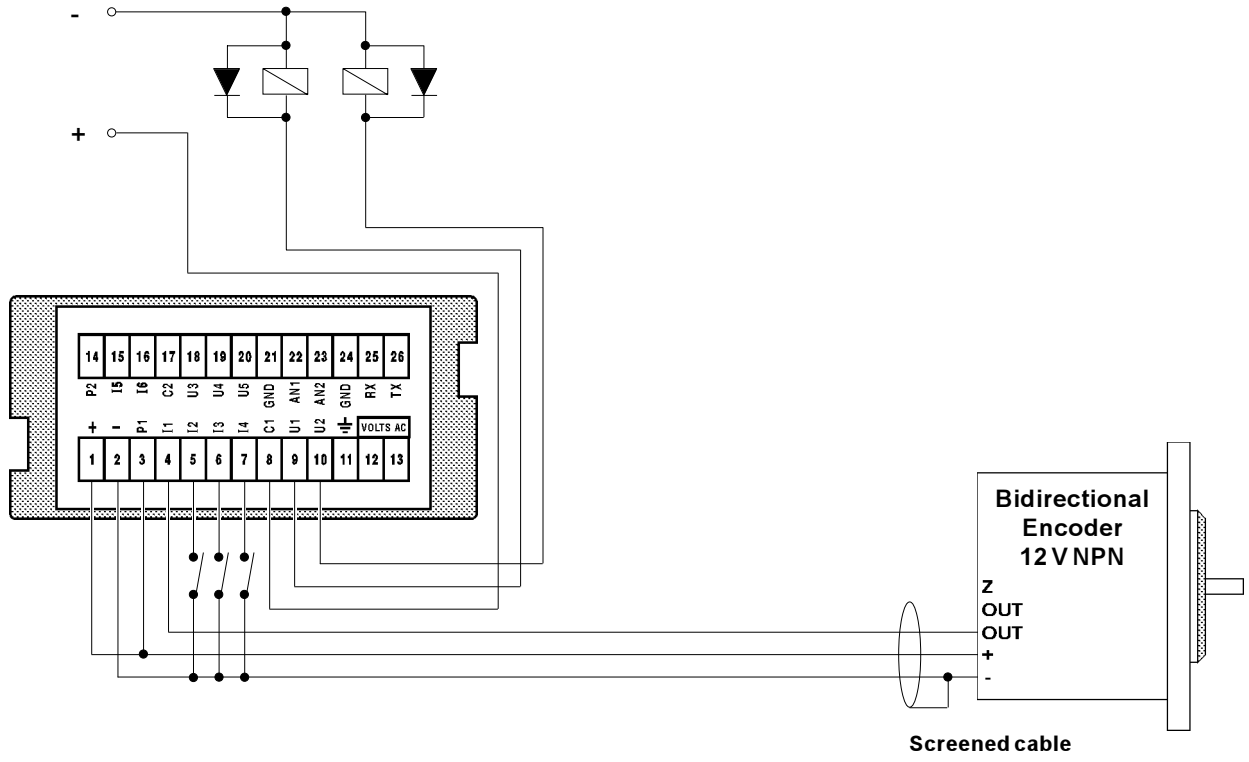
Each ON / OFF input is universal, optoinsulated and can receive digital signals be it in logic NPN be it PNP. Connecting the terminals P1, P2, to "+" all the inputs accept signals of type NPN, i.e. with closing to the negative of the power supply voltage. By connecting terminals P1, P2, to - all the inputs become of type PNP, i.e. with closing to the positive of the power supply voltage. Each input is protected against short circuits to both the poles of the power supply, so that it is practically undestructible. It is possible to connect in parallel various inputs with the same logic, if the output which controls them is able to support the total current required, which is equal to the number of inputs connected together, multiplied by10 mA.

OUTPUTS

The dc outputs are optoinsulated in direct voltage and they all have a common terminal among them (C1, C2). Connecting this terminal to a voltage "+" all the outputs become of a type PNP, connecting it to a voltage - they become of a type NPN. The maximum direct voltage which can be applied is 50 V. The outputs can support currents up to70 mA with a typical voltage drop of 3.5 V for outputs of type U and up to 2 A with a typical voltage drop of 2 V for outputs of type UP, between the output and the common. With the dc outputs it is possible to drive also relays at 24 Vac.

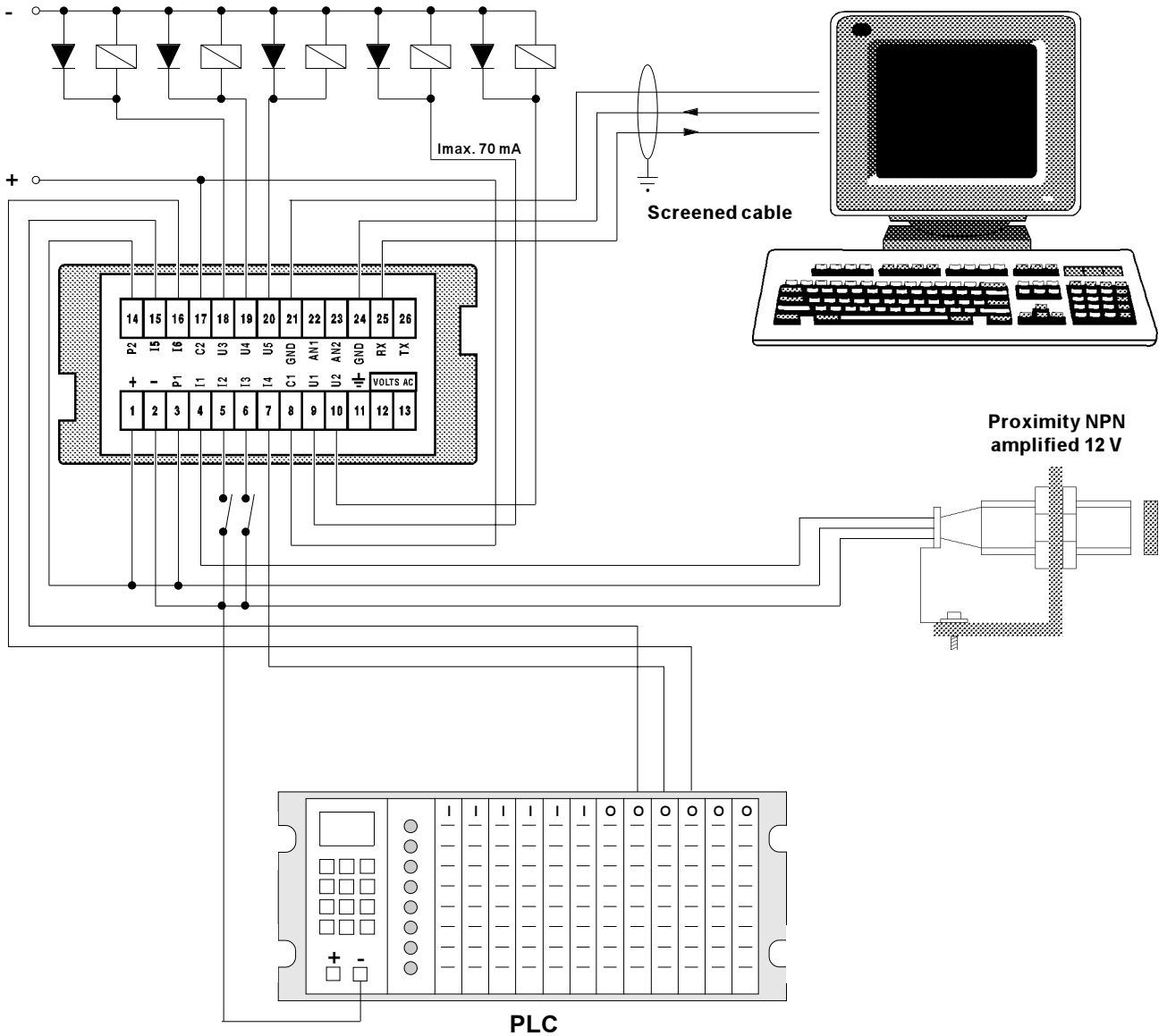
CONNECTION DIAGRAM

FIG. 1: Connection of a HM 207.11 with relay in direct current and inputs **NPN**

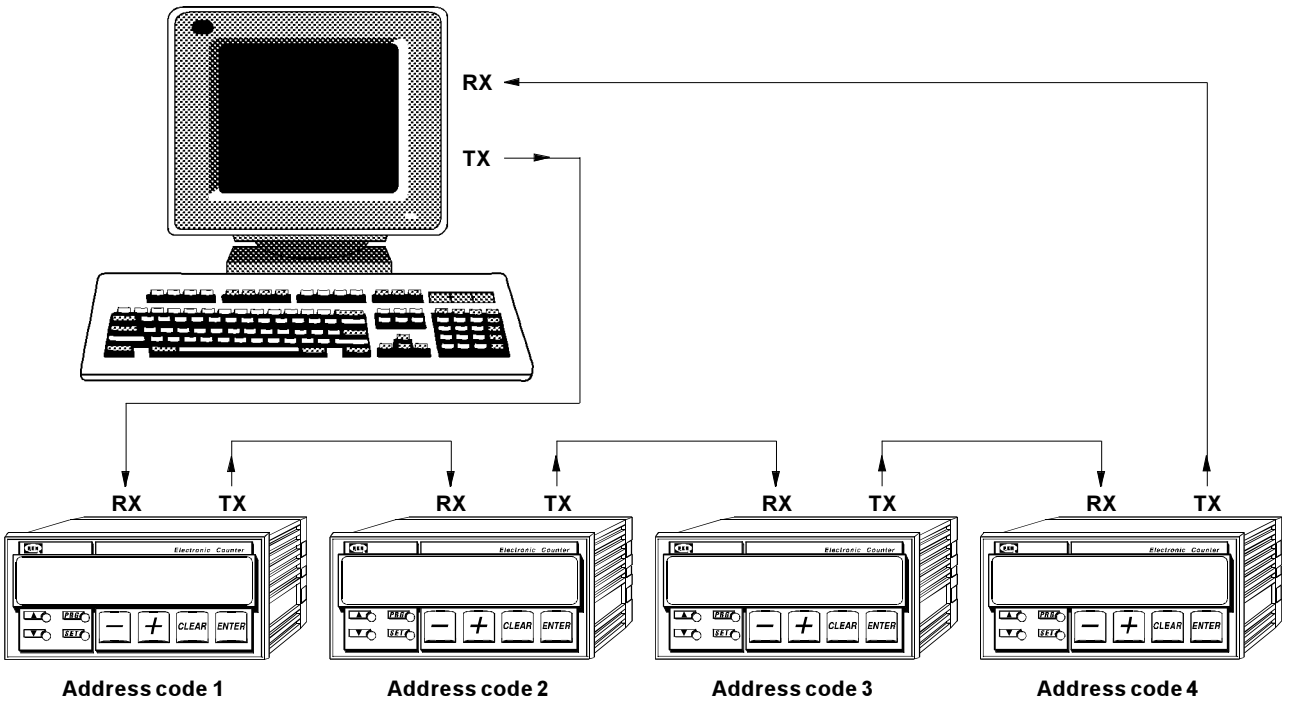


CONNECTION DIAGRAM

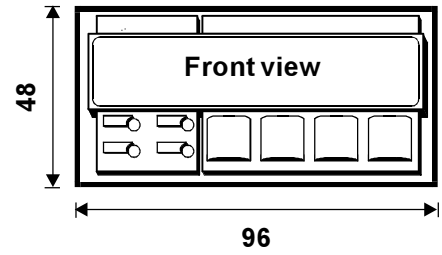
FIG. 3: Connection of a HM 207.11 with relay in direct current and inputs **NPN**

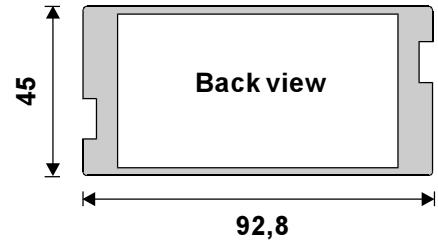


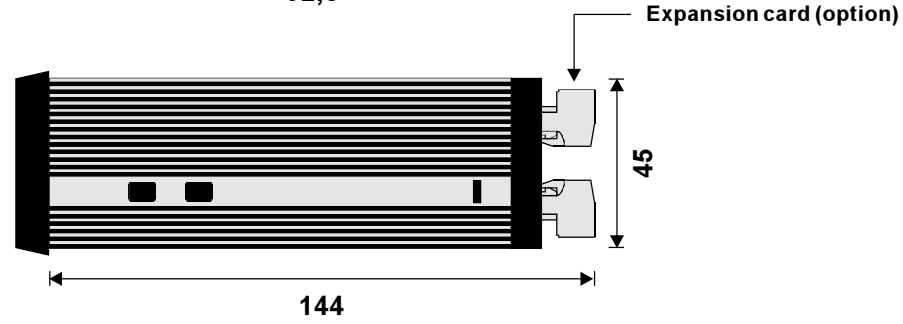
SERIAL SU HM 207.11: DAISY - CHAIN CONNECTION

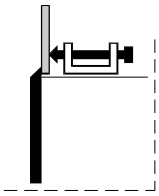


SIZE

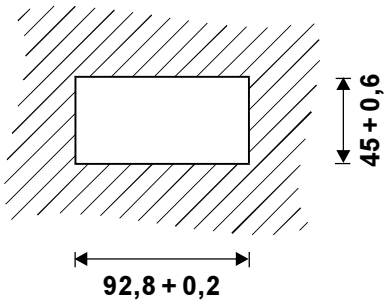








ATTENTION!
After laying the pin of the hooking to the panel, perform only half a rotation, in order not to tear off the frame.



N.B. All levels are expressed in millimeters.

ORDERING CODE

HM 207.11 / [T] / [ ] / [ ] / [ ]

24 = 24 Vac
110 = 110 Vac
220 = 220 Vac

RS = Serial interface RS 232-C optoinsulated

E = Expansion 2 inputs NPN / PNP with 3 static outputs 24 V ac / dc 70 mA

T = Front panel in polycarbonate with keyboard
P = Front panel without keyboard
PC = Front panel without keyboard but with pushbutton CLEAR
PE = Front panel without keyboard but with pushbutton ENTER

QEM srl - Località Signolo SS. 11 - Km 339 - Montebello Vicentino (VI) - Italy
Tel. 0444 - 440061 (3 linee r.a.) - Telefax 0444 - 440229