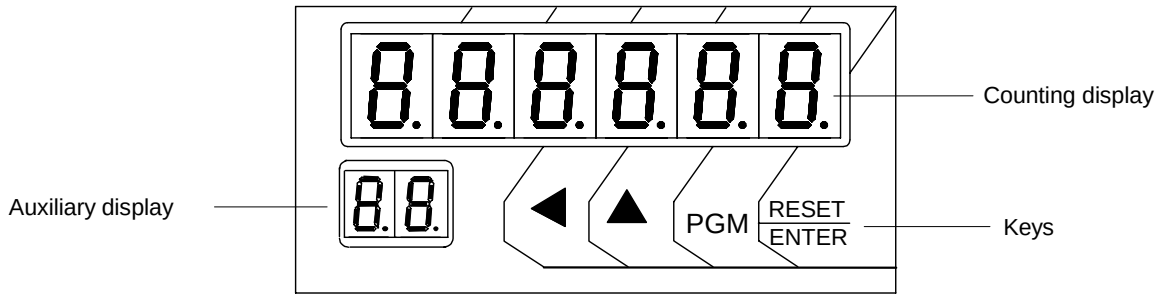
Tachometer Production Counter Microprocessor

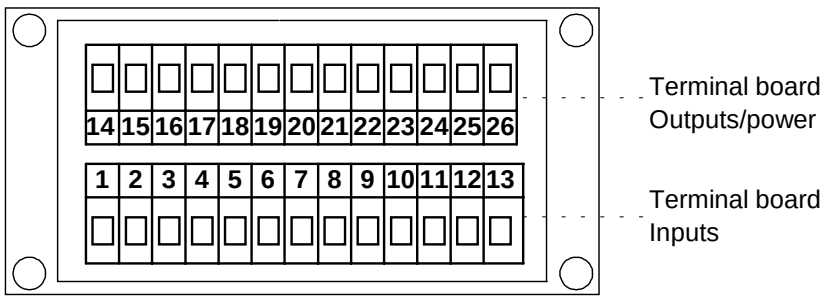
Description

The G1X_ instrument is a programmable microprocessor instrument with a 6 digit display (scale –99999, 9999999), which can be used as a counter of frequencies, periods, revolutions, pieces , and meters.
The counter elaborates signals supplied from linear, inductive, and capacitive sensors, mechanical contacts etc. The microprocessor programming, by means of 4 keys set on the front panel after introducing a password, allows the setting of all parameters that govern the working of the instrument. A 2 digit auxiliary display helps the programming of the instrument.
This microprocessor can handle two separate, and independent counts with two distinct inputs. Every input is associated to its own correction factor (piece counter), and its speed visualization. For every counter you can activate the total/partial working mode, which can be cleared by means of the keyboard or by the terminal-board.
The storage of datas is ensured by a no volatile memory EEPROM when the machine is switched off.
The instrument is set into a panel case 48x96 according to DIN 43700.

Front view



Back view



Inputs description

G1X_ has 5 optoisolated inputs (see connection scheme) :

IN1	count and frequency input for counter 1
IN2	count input for counter 2 (piece counter)
RESET1	input for Reset 1 or stop for counter 1
RESET2	input for Reset 2 or stop for counter 2
START/STOP	start/stop input for hours counter

Programming

The keys which are employed for the programming are:

▲	to increase the digit you are modifying, to select the constant to modify
◀	to skip from a digit to the following one, to leave the condition of Hold and visualize the current number
RESET/ENTER	to confirm the introduced values,
PGM	to start an to leave the programming mode

Press	**PGM**	in order to start with the programming phase: for some seconds the word *"Set1"* will be shown, followed by *"000" ,* whose first number blinks on the right side.This particular signal means that you have to introduce the password, therefore select the number **273** in the following way:
press	▲	to increase the value of the blinking number
press	◀	to select the blinking number

after programming the number 273 ,press **RESET/ENTER** in order to confirm it, and the constant value, you have just selected, will be shown.

N.B.: in case you insert a wrong password, the instrument leaves the programming phase.

Press	**RESET/ENTER**	and modify the constante value by means of these two keys ▲ ◀
press	**RESET/ENTER**	to confirm the value, you have just inserted
press	▲	to reach other constants, or
double press	◀	to leave the programming phase

In the programming phase you can see all the constants which have been programmed by means of the key▲ :

1st Programming Level:

MODE	Reading function (RPM, metercounters, production counters, frequencymeter)
NUM.DEC	Decimal numbers on the display
TIME.OUT	Time for the zero-setting of the reading function
MOD.AZZ	Total and partial zero-setting mode
FILTRO	filter for mechanical contacts
MOD.SET	Relays mode (only in the models supplied with relays)
MOD.PAS	Set protection by means of a password
T.DELAY	Delay of the relays output when the instrument is switched on (only in the model supplied with relays)
BAUDE	baude rate serial port (not used, set to disab)
END	End of the first programming level

2nd Programming Level:

COUNT1 programming of count 1 (disabled, connected, partial, total count etc..)

COUNT2 programming of count 2 (disabled, connected, partial, total count ecc..)

COUNT.H programming of the hours counter (disabled, connected to a terminal board etc..)

Mode: Reading Mode

This working function is used to programme the display for the frequency used with Input **IN1**.
Press the key **RESET/ENTER** : the running programming is flashing; please select the reading mode you prefer by means of the key :

RPM reading mode: there is only one parameter to insert:
N.RIF. = number of pulses on the rotating shaft (from 0 to 999999).
After introducing the right value please press RESET/ENTER to confirm your choice.

During the working phase, when the display shows rpm, the auxiliary display shows ***"rP"***.

METERCOUNTER: Speed reading of peripheral wheels, rollers, belts etc…please programme in the following way:
N.RIF. = number of pulses on the rotating shaft (from 0 to 999999).
DIAM. = roller diameter expressed in mm, tenths, hundreths (from 0,01 to 9999,99 mm).
VIS. = speed visualization
The unit of measure for length can be chosen among: Km, mt, cm, mm.
The unit of measure of time can be chosen among hours (h), minutes (min), seconds (sec).
Programme the value you need by means of the keys and , and confirm your choice by means of RESET/ENTER
N.B.: all combinations are allowed: Km/h, mt/h, mm/h, km/min, ecc...
During the working phase, when the display shows the production count, "CM" is visualized on the auxiliary display.

PRODUCTION COUNTER reading mode of the piece number referring to a unit of time :
PIECES = number of pieces (from 1 to 999999)
PULSE = number of input impulses corresponding to the number of pieces you have just programmed (from 1 to 999999)
VIS. = visualization mode of the speed, which can be selected by among the number of pieces / hour (PCS.h), /minute (PCS.min), / second (PCS.sec).

When the visualization shows the production count, the auxiliary display shows ***"CP"***.

FREQUENCYMETER reading of the input frequency, please programme the instrument in the following way:
NUM = numerator (multiplier of the input frequency from 1 to 999999)
DENO= denominator (divisor of the input frequency from 1 to 999999)
The reading on the display corresponds to the input frequency (in Hertz) multiplied by costant **NUM.** and divided by costant **DENO**.
During the working phase, when you have a frequencymeter visualization, the auxiliary display will show ***"Fr"***.

N.DEC. : Numbers of decimal digits

Programme the decimal point: 0= no decimal point, 1= a decimal point, etc till 4 decimal numbers.
While programming the decimal number the auxiliary display shows ***"n.d."***

Time.Out : Zero Setting

The time-out mode represents the time expressed in seconds, which causes the zero setting of the instrument when it does not receive any further input impulse. Please do not forget to programme a value higher than the lowest time interval (nb: this interval represents the time which passes between two impulses). If you forget to programme this process the instrument will show only zero.

0 and 1 are not allowed: please insert a value between 2 and 999 seconds
During the programming of the Time Out function the auxiliary display will show ***"ti"***.

Mod.Azz.: Zero Setting

The zero-setting mode allows you to select the working way of the instrument after pressing the key Reset/Enter or after activating the inputs of Reset 1, and Reset 2 on the terminal board. Press **RESET/ENTER** to activate the programming: for a while you will read **RESET1** and **RESET2** followed by the running value . Choose **RESET/ENTER** to activate the modification: the running value flashes. By means of the key choose the function you need according to the following scheme :

Impostazione	Function associated to RESET1 input
dISAb	disabled
tot.1	Zero setting of total count 1
Par.1	Zero setting of partial count 1
tot.2	Zero setting of total count 2
Par.2	Zero setting of partial count 2
to.par.1	Zero setting of total, and partial count 1
to.par.2	Zero setting of partial, and total count 2

Press **RESET/ENTER** to confirm the working mode you need.
Start the programming of the input of Reset 2. You will see the word "Reset 2 " for some seconds, followed by its running value. Choose **RESET/ENTER** to start your modification: the running value will flash. By means of the key choose the function you need according to the following scheme:

Impostazione	Function associated to RESET2 input
dISAb	Disabilitato
tot.1	Zero setting of total count 1
to.par.1	Zero setting of total, and partial count 1
to.par.2	Zero setting of total, and partial count 2
hold1	Stop of count 1
hold2	Stop of count 2

Press **RESET/ENTER** to confirm the working mode you have just chosen.
RESET/ENTER FUNCTION: for some seconds the word *"tasto"* will be displayed followed by the running programming. Press **RESET/ENTER** to start the modification: the running value flashes. By means of the key choose the working mode you need according to the following scheme:

Impostazione	Function associated to RESET/ENTER key
dISAb	Disabilitato
Abil	Connected, zero setting of the running count
ritar	3-second-delay, zero setting of the running count

Press **RESET/ENTER** to confirm the selection .

Filtro: Input Filter for mechanical contact

By means of this constant you can insert a filter for mechanical contacts at input **IN1.** Press **RESET/ENTER** to start the modification. Please select either "FAST" (the filter has not been connected yet) or "SHOW" (connected filter) by means of . Please confirm this operation through **RESET/ENTE**R.

Mod.Set

This working mode is not used in the model without relays. Please leave 0.

*T.dela*y: delayed activation of relays

This working function is not used in the model without relays.

Mod.Pas

It is not used in the model without relays.

Baude: Serial output port

It is not used in the model without relays. Please set to d 19200.

2nd Programming Level

The programming of the following parameters is not necessary if the total/partial piece-counter, and hours-counter are not employed. Please select the function *"End"* to enter the 2 nd programming by means of the key , and keep pressing **RESET/ENTER** until you see the constant *"Count.1"*.
By means of the key please select the function you need among the following ones:

COUNT1 programming for count 1 (from in1 input)
COUNT2 programming for count 2 (from in2 input)
COUNT.H programming for the hours-counter

and press **RESET/ENTER**.

During the working mode press the keys ▲ and ◀. to reach your next visualization.

Count.1 Settings

Count 1 referrs to the impulses of Input **IN1**.
Choose **RESET/ENTER** to start the programming: the word *"Mod.C1"* will be shown (working mode of count 1) followed by the running function. Press **RESET/ENTER** ; by means of the key choose the working mode among those shown in the following scheme, and confirm it by means of **RESET/ENTE**R.

Impostazione	Funzione associata
disab	The impulse count is disabled
totale	Impulse count, and visualization in the unit of measure chosen in the constant *Mode* Ex: if you choose a visualization in RPM in the constant *Mod*e, the revolutions will be displayed as follows: mt/min If you choose a metercounter visualization in mt/min, meters will be displayed etc…
tot.par	Impulse count in total or partial modes, and visualization of the unit of measure in the constant *Mode.*

In the working phase, when the total phase of count 1 is displayed, the auxiliary display shows ***"T1***". When the partial phase of Count 1 is displayed, the auxiliary display will show ***"P1.***
Press the digits ▲ and ◀. to reach your following visualization.

Set3 Programming

This function is not employed in the model without relays.

Set3 Mode

It is not used in the model without relays, **please leave 0.**

Count.2 Settings

Count 2 refers to the input impulses **IN2**.
Press **RESET/ENTER** to start the programming: the word *"Mod.C2"* (mode of count2) is followed by its running function. Press **RESET/ENTE**R: by means of the key please select the programming you need among those of the following scheme, and confirm it by pressing **RESET/ENTER**.

Impostazione	Funzione associata
disab	The impulse count is disabled
totale	The impulse count is connected
tot.par	Conteggio degli impulsi in modalità Totale e Parziale

As soon as you connect the partial or total count you are asked to input the following information:

"*Pieces"* number of pieces, input the number you need, and confirm by means of **RESET/ENTE**R.
"Pulse" number of impulses corresponding to the number of pieces programmed in the working
Example: if you have to increase the count of 15 after 100 impulses, please input *Pieces* = 15 and *Pulse* = 100
During the working phase the auxiliary display shows ***"T2***"; if the total phase of Count 2 is visualized; the auxiliary display will show ***"P2****."* when the partial phase of Count 2 is visualized.Please press the keys and to reach the following visualization.

Programming of Set 4

It is not used in the model without relays.

Mode of Set4

It is not used in the model without relay, **please leave 0.**

Filter for Mechanical Contacts *Filtro*

By means of this constant you can insert a filter for mechanical contacts at input **IN1.** Press **RESET/ENTER** to start the modification. Please select either "FAST" (the filter has not been connected yet) or "SHOW" (connected filter) by means of key ▲. . Please confirm this operation through **RESET/ENTE**R.

Count.H Hours Counter

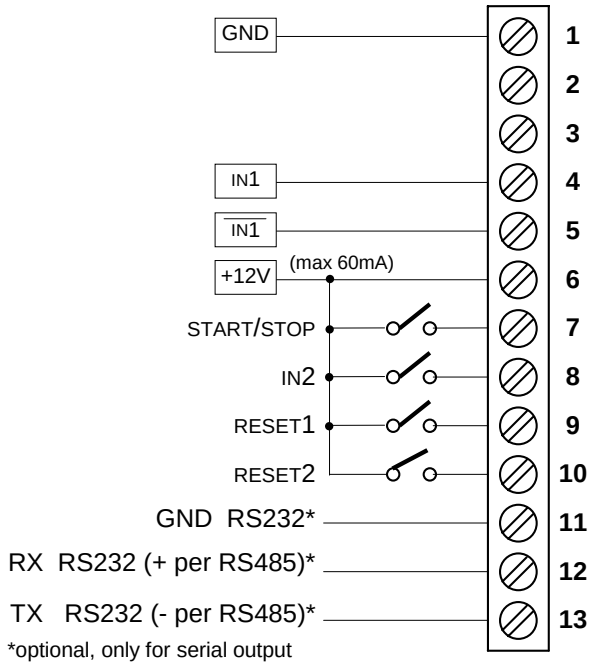
By means of this constant you can input a filter for the count from mechanical contacts at the input **IN**2.
Please press **RESET/ENTER** to start your modification, and select your working phase between *"Fas*t" (it means that the filter was not introduced), and *"Slo*w" (the filter is connected) by means of the key .
Please confirm through **RESET/ENTE**R.

Impostazione	Funzione associata
disab	The hours counter is disabled
Abil	The hours counter is always connected
Str.Stp	The hours counter is connected or disabled from the contact on The terminal board: when the Start/Stop contact is closed it means that the count is connected.
Store	The hours counter is always connected: by means of this working function you can record the time which has passed from your switching on of the instrument.

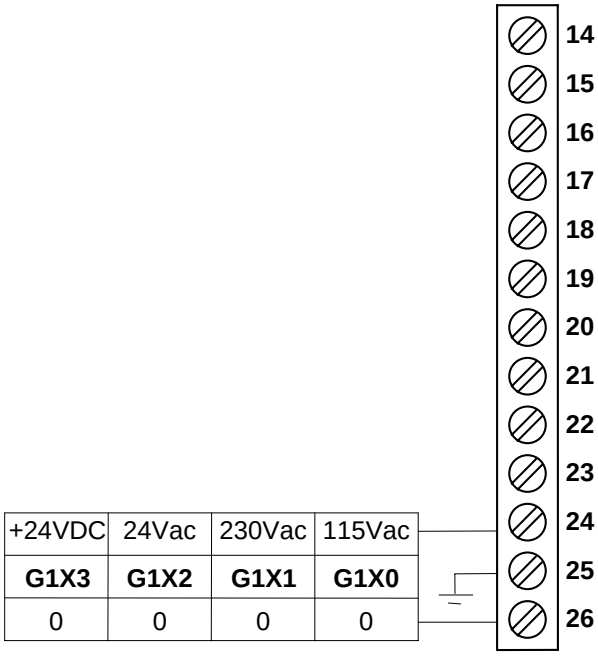
When hours are visualized during the working phase, the auxiliary display will show ***"tM****".* Please press the keys ▲ and ◀. to reach the following visualization during the working phase.

Connection scheme

Terminal board of the inputs



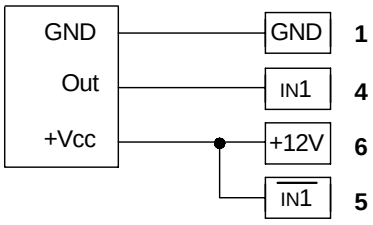
Terminal board
Power supply output



+24VDC	24Vac	230Vac	115Vac
G1X3	**G1X2**	**G1X1**	**G1X0**
0	0	0	0

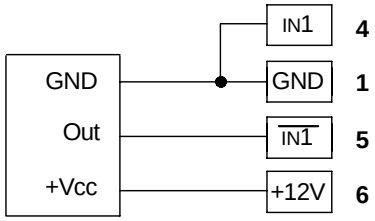
Connection scheme for sensors

Wiring sensors open collector NPN or push-pull output



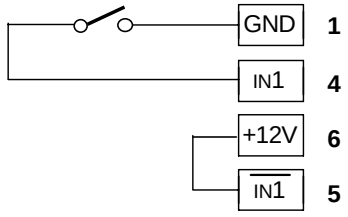
NPN

Wiring sensors open collector PNP or push-pull output



PNP

Wiring for mechanical contact



NB: please take care to activate filter input mode

General Features

Power supply	110Vac, 220Vac, 24Vac, 24Vdc ± 10%
Line frequency	50/60 Hz
Power draw	3VA
Display	6 digits -99999 ÷ 999999
Input type	Optoinsulated
Sensor power supply output	12Vdc (max 60mA)
Sensor input	Open collector NPN/PNP Push-pull Line driver differential 12V
Max. input frequency	10 KHz
5 optoinsulated input ON/OFF	In1 - counter1 in2 - counter2 Reset1 Reset2 Start/Stop
Serial Port(optional)	RS232, RS485
Working room temperature	0-50°C
Relative humidity	35-85%
Self-extinguish and anticollision case	DIN 43700
Front case protection degree	IP54
Measures (terminal board included)	48x96x120 mm
Perforation profile	45x92 mm

Directive: Electromagnetic compatibility 2014/30/EU, Low voltage 2014/35/EU, RoHS 2011/65/EU