

Tachometer Production Counter Microprocessor

Description

The G1X_T 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 supplied with an analogical output 0÷10V e 4÷20mA.

The counter elaborates signals supplied from linear, inductive, and capacitive sensors, mechanical contacts etc... .

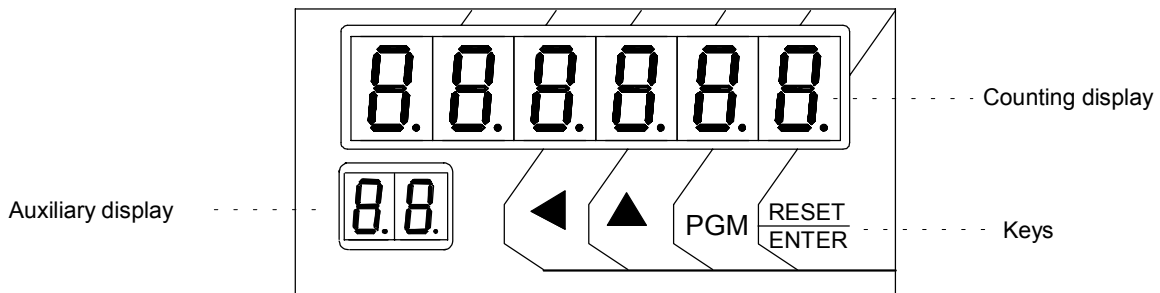
The microprocessor programming, by means of 4 keys set on the front panel after introducing a password, allows the setting of all parameters that govern the working of the instrument. A 2 digit auxiliary display helps the programming of the instrument.

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.

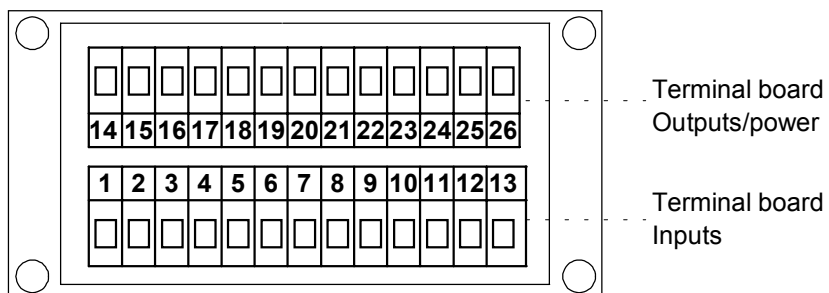
The storage of datas is ensured by a no volatile memory EEPROM when the machine is switched off.

The instrument is set into a panel case 48x96 according to DIN 43700.

Frontal Sight



Hinder Sight





Input Descriptions

G1X_T 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 employed to programme the instrument are the following ones:





	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 constant formulation mode, to leave the Hold condition and visualize the current number
RESET/ENTER	to confirm the introduced values
PGM	to start the programming

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 press 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. The constant value, you have just selected, will be shown.

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

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

In the programming phase, you can see all the constants which have to be programmed through the key :

1ST 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 sensitization mode (only in the models supplied with relays)
T.DELAY	Delay of the relays sensitization when the instrument is switched on (only in the model supplied with relays)
LOW	Minimum value of the analogical output
HIGH	Max. value of the analogical output
LIM.INF	Lowest speed limit corresponding to the minimum analogical output
LIM.SUP	Higher speed limit corresponding to the max. analogical output
MOD.PAS	Set protection by means of a password
END	End of the first programming level

2ND 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 RPM reading mode: there is only one parameter to insert:
N.RIF. = number of connected benchmarks 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 connected benchmarks on the rotating shafts (from 1 to 999999)

DIAM. = roller diameter expressed in mm, tenths, hundredths (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 constant **NUM.** and divided by constant **DENO.**

During the working phase, when you have a frequencymeter visualization, the auxiliary display will show "**Fr**".

N.DEC.

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 :

Programming	Function Associated to the Input of Reset 1
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:

Programming	Function associated to RESET2
dISAb	Disabled
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:

Programming	Function associated to RESET/ENTER
dISAb	Disabled
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 .

Input Filter for mechanical contact *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 ▲. Please confirm this operation through **RESET/ENTER**.

Mod.Set

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

T.delay: delayed activation of relays

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

Low: min. value of the analogical output

The lowest value of the analogical output is the voltage or the current value which corresponds to the lowest speed limit. It expresses the percentage of the highest value (10 V for the voltage output, and 20mA for the current output), and it is programmable between 0, and 100.

High: highest value of the analogical output

The highest value of the analogical output is represented by the voltage or the current values, which correspond to the highest speed limit. It expresses the percentage of the highest value (10V for the voltage output, and 20mA for the current output), and it is programmable between 0 and 100.

Lim.Inf: lowest speed limit

It represents the speed value which corresponds to the lowest value of the analogical output. It can be included in all values between 0 and 999999. Do not forget that the lowest value cannot be higher than the highest limit.

Lim.Sup: highest speed limit

It represents the speed value which corresponds to the highest analogical output. The range of this value is included between 0 and 999999 but the highest value cannot be lower than the lowest limit.

If you happen to input wrong parameters for the analogical output (highest value > lowest value), the word "ERROR.1" will be displayed. The values you have just input will not be taken into consideration for the following programming.

Mod.Pas:

It is not used in the model without relays.

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 2nd 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

Count 1 refers 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/ENTER**.

Programming	Associated Function
disab	The impulse count is disabled
total	Impulse count, and visualization in the unit of measure chosen in the constant <i>Mode</i> Ex: if you choose a visualization in RPM in the constant <i>Mode</i> , 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 <i>Mode</i> .

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.

Programming of Set3

This function is not employed in the model without relays.

Connection of Set3

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

Programming of Count.2

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/ENTER**: by means of the key ▲ please select the programming you need among those of the following scheme, and confirm it by pressing **RESET/ENTER**.

Programming	Associated Function
disab	The impulse count is disabled
totale	The impulse count is connected
tot.par	Total, and partial impulse count

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/ENTER**.

“*Pulse*” number of impulses corresponding to the number of pieces programmed in the working mode

“*Pieces*”. Programme the number you need, and confirm by means of **RESET/ENTER**.

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.

Connecting 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 input a filter for the count from mechanical contacts at the input **IN2**. Please press **RESET/ENTER** to start your modification, and select your working phase between “Fast” (it means that the filter was not introduced), and “Slow” (the filter is connected) by means of the key **▲**. Please confirm through **RESET/ENTER**.

Hours Counter *Count.H*

Press **RESET/ENTER** to start the programming: for some seconds you will read “Mod.C H” (working mode of hours counter) followed by its running function. Press **RESET/ENTER** by means of the key **▲**. Choose the programming you need among those mentioned in the following scheme, and press **RESET/ENTER** to confirm your choice.

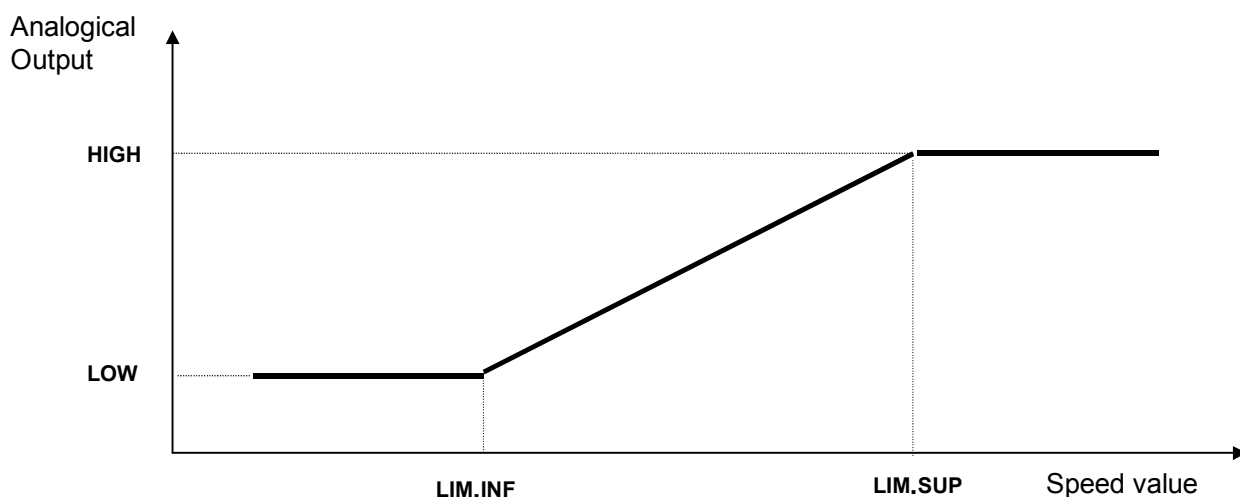
Programming	Associated Function
disab	The hours counter is disabled
Abil	The hours counter is always connected
Str.Stp	The hours counter is connected or disabled from the contact on the terminal board: when the Start/Stop contact is closed it means that the count is connected.
Store	The hours counter 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.

Analogical Output

For speed values lower than the lowest limit, the analogical output is fixed on the value Low; for speed values higher than the highest limit, the analogical output is fixed on the “High” value.

If you insert wrong parameters about the analogical output (lowest limit > highest limit), the display will show “ERROR.1” to underline your mistake.

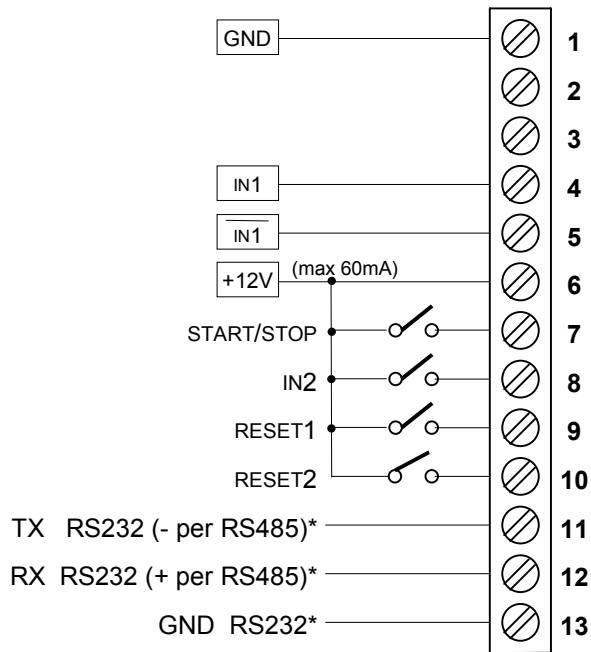


Example:

The speed value has a change between 0 and 3000, the analogical output in voltage rating gets the value of 0 Volt for a 0 speed, and 10 Volt for a speed of 3000. Please programme this working function in the following way **LOW = 0**, **HIGH = 100**, **LIM.INF = 0**, **LIM.SUP = 3000**.

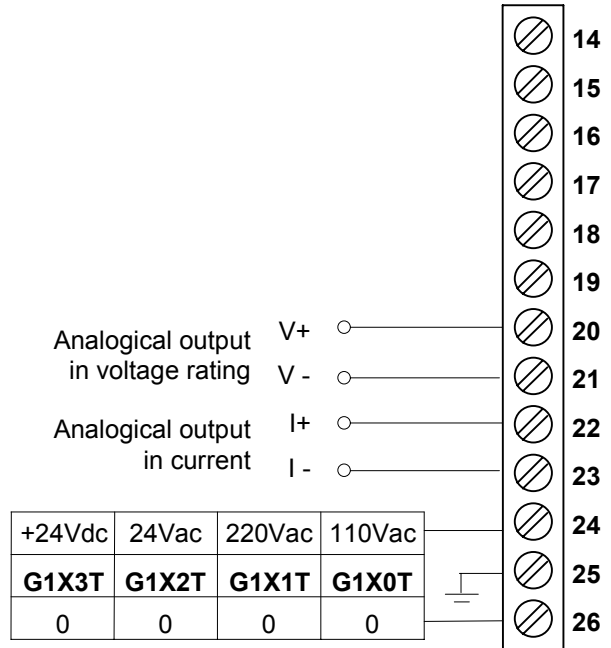
Connecting Scheme on the Terminal Board

Terminal board of the inputs

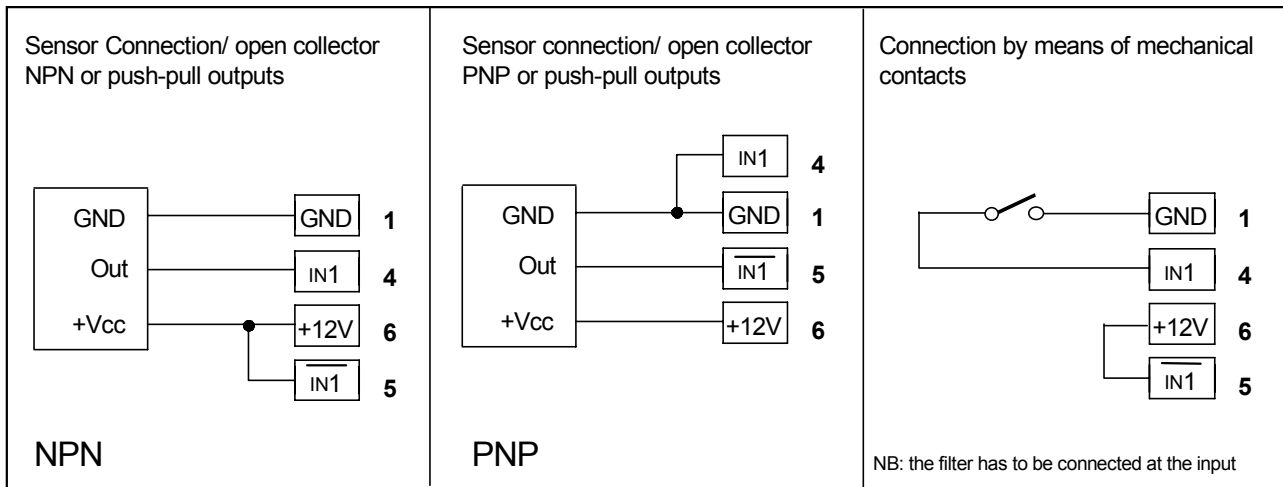


*optional

Terminal board
Power supply output



Transducers Connecting Scheme



General Features

- Power supply 110Vac, 220Vac, 24Vac, 15÷30Vdc ± 10%
- Frequency rate 50/60 Hz
- Power absorbed 4VA
- Display 6 digits 0 - 999999
- Power supply of the sensor 12Vdc (max 60mA)
- Sensor input Open collector NPN/PNP
Push-pull
Differential Line driver
Mechanical contact
Static input

- Max. input frequency 2 KHz
- 5 optoisolated ON/OFF inputs In1 - counter1
in2 – counter 2
Reset1
Reset2
Start/Stop

- Analogical output in voltage rating 0 ÷ 10 Volts
- Analogical output in current 4 ÷ 20 mA
- Min. load impedance for voltage output 1 KOhm
- Max. load impedance for current output 500 Ohm
- Resolution of the analogical output 10 bits
- Accuracy of the analogical output ± 1% FS max
- Thermic stability of the analogical output 200 ppm /°C
- Working temperature 0-50°C
- Relative humidity 10-90%
- Self extinguishing, shock-resistant case DIN 43700
- Frontal case protection degree IP54
- Dimension with terminal board 48x96x120 mm
- Boring template 45x92 mm
- Electromagnetic compatibility CEE 2004/108