



FEATURES

- INPUT FREQUENCY 0 - 30 000 Hz IN 8 RANGES
- ACCEPTS NPN / PNP OPEN COLLECTOR, REED SWITCHES, DRY CONTACTS, WAVES, LOGICAL SIGNALS AND OTHERS
- THE INPUT PROVIDES 5.5 V / 20 mA TO POWER THE SENSOR
- THE OUTPUT CAN BE CONFIGURED ON THE FIELD FOR ACTIVE / PASSIVE 2 WIRE 0-20 mA, 4-20 mA, 0-5V, 0-10V, 1-5V, 2-10V
- THE POWER IS ISOLATED FROM BOTH INPUT AND OUTPUT
- HIGH ACCURACY AND RESOLUTION
- NO PROGRAMMING REQUIRED. ALL CONFIGURATIONS ARE DONE BY JUST CHANGING A FEW DIP SWITCHES AND WIRING
- HIGH PROTECTION ON BOTH INPUT AND OUTPUT
- ISOLATION VOLTAGE > 1000 VDC
- ISOLATION RESISTANCE > 100 Mohm @ 500 VDC
- NEEDS 21.6 – 26.4V DC POWER
- QUICK AND SIMPLE WIRING
- LxWxH = 90x17.5x56 mm (3.55"x0.69"x2.21")
- WEIGHT = 45 g (1.6 oz)

APPLICATIONS

- INDUSTRIAL SIGNALS ISOLATION
- INDUSTRIAL CONTROL
- MEASUREMENT APPLICATIONS
- SCADA



1. DESCRIPTION

GPI13 is a frequency to analog isolator. The input frequency can be from 0 to 30 000 Hz in 8 ranges. The input accepts npn / pnp open drain / collector, reed switch, dry contact, waves, logical signals and others. It can also power the sensor with isolated, filtered and protected 5.5 V DC.

The output can be configured for active / passive, 0-20 mA, 4-20 mA, 0-5V, 0-10V, 1-5V and 2-10V. When active the output provides isolated, filtered and protected 24V DC to the current loop.

All configurations are done by changing a few DIP switches and the wiring. It can be done at any time on the field without the need of any special tools or calibrators.

The power is isolated from the input and from the output. It has to be 21.6 – 26.4V DC.

With its high accuracy, DIN rail mounting, very small size, slim design, high isolation and functionality GPI13 is an excellent choice for isolating and converting frequency to analog signals.



2. ABSOLUTE MAXIMUM RATINGS *

Power	26.4V DC
Operating temperature	0 to 50 °C
Output voltage, when passive	40 V DC
Voltage to the input	36 V DC

* **NOTE: Stresses above those ratings may cause permanent damage to the device.**

3. CHARACTERISTICS

Parameter	Conditions	Min	Typical	Max	Units
Power					
Voltage	24V DC regulated and filtered is strongly recommended	21.6	24	26.4	V DC
Consumption					VA
Input					
Voltage for the sensor	0 to 50 °C, 20 mA max		5.5		V DC
Frequency	In 8 ranges, Note 2	0		30 000	Hz
Threshold, low	Wave or logical signal (CMOS, TTL etc.)		0.85		V DC
Threshold, high	Wave or logical signal (CMOS, TTL etc.)		2.2		V DC
Output, 4-20 mA					
Loop power, passive, 2 wire					
Power supply, if passive	0 to 50 °C, Note 1	4.5		36	V DC
Maximum load, passive	36V external power to the loop, Note 1	1575			ohm
Maximum load, active	No external power to the loop, Note 1	925			ohm
Resolution	0 to 50 °C, 4.5 – 36 V		5		uA
Error	250 ohm load, 24 V, 25 °C		0.05		% FS
Temperature coefficient	0 to 50 °C, 24 V		35		ppm/°C
Output, 0–5 / 10 V					
No external power required, 2 wire					
Resolution			1.25 / 2.5		mV
Minimum load for 0-5V		500			kohm
Minimum load for 0-10V		1			Mohm
Isolation voltage	Input to output, input to power, output to power	1000			VDC
Isolation resistance	Input to output, input to power, output to power, @ 500 VDC	100			Mohm

Note 1: The minimum voltage for the 4-20 mA passive output to operate is $V = 4.5 + R \text{ load [ohm]} * 0.020$ [V DC]
 For a GPI13 with a load of 250 ohm, the minimum voltage would be 9.5 V DC.
 When active the output can work with a load up to 925 ohm

Note 2: If the range is 0 – 10 Hz, 0 – 30 Hz or 0 – 100 Hz, the input frequency will be cut at about 0.1 Hz so Gpi13 can provide faster response and smooth output signal at very low frequencies.

4. APPLICATION

4.1. MECHANICAL

Mounting GPI13 on the DIN rail requires an area of 98 x 17.5 mm (3.86" x 0.69").

4.2. ELECTRICAL

Here are the terminals of GPI13

Power: 4 is NC (no connect)
5 is 24V DC “+”
6 is 24V DC “-”

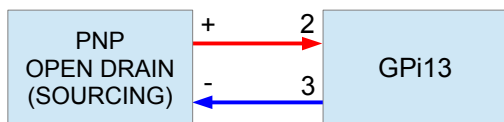
Use regulated 24V DC power. The voltage must be between 21.6 and 26.4V DC.

Input: 1 is Power for the sensor, 5.5 V, 20 mA max
2 is Input signal (Frequency)
3 is Input ground (common)

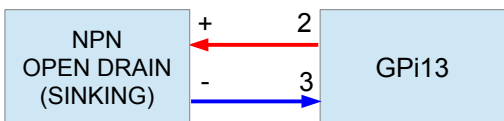
Output: 10 is Output power “+”
11 is Output “+”
12 is Output ground (common)

4.2.1. WIRING AND CONFIGURING THE INPUT

4.2.1.1. PNP OPEN DRAIN / COLLECTOR, SOURCING



4.2.1.2. NPN OPEN DRAIN / COLLECTOR, SINKING



4.2.1.3. REED SWITCH, DRY CONTACT, WAVES, LOGICAL SIGNALS

Connect to terminal 2 and 3. The dry contact may need extra filtering – look bellow at the DIP switches tables.

4.2.1.4. POWERING THE SENSOR

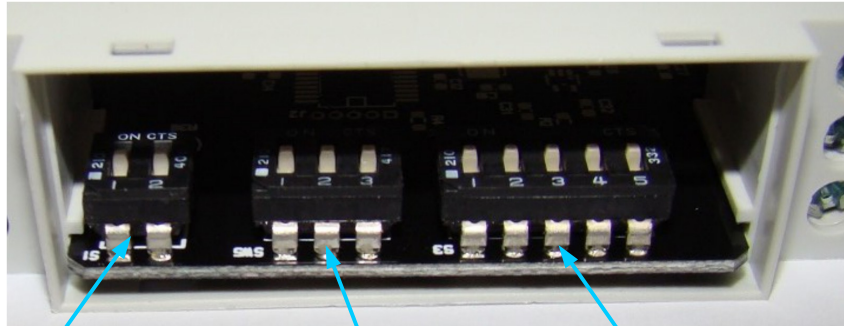
If the frequency sensor can work with 5.5 V DC and 20 mA max, then Gpi13 can power the sensor. The connection will be 3 wires.

sensor power “+”	- terminal 1
frequency signal	- terminal 2
sensor power “-”	- terminal 3, this must also be the common for the signal

4.2.1.5. DIP SWITCHES RELATED TO THE INPUT

There are 3 DIP switches on this device under the small cover of the top of the enclosure. The larger

switch DIP5 is for the input and output. The switch in the middle is for the frequency range. The small switch DIP2 is for configuring the output.



DIP2 FOR THE OUTPUT

DIP3 FOR THE RANGE

DIP5

Type of sensor to wire

INPUT SIGNAL	LARGE DIP5 SWITCH
PNP, OD/OC	
NPN, OD/OC, reed switch, dry contact	
Waves, logical signals	

Filtering / Damping of the input

INPUT FREQUENCY RANGE	LARGE DIP5 SWITCH
0 – 10 Hz, dry contacts	
0 – 30 Hz, dry contacts	
0 – 100 Hz, 0 – 300 Hz	
All other ranges	

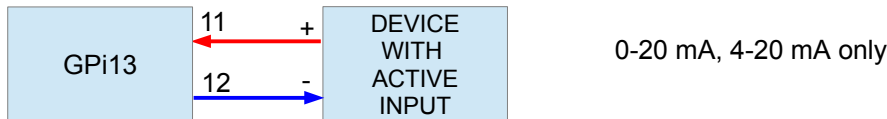
Note: The filtering needed strongly depends on the shape and duration of the input pulse. The suggestions above are a starting point for a reference only

Input Frequency Ranges

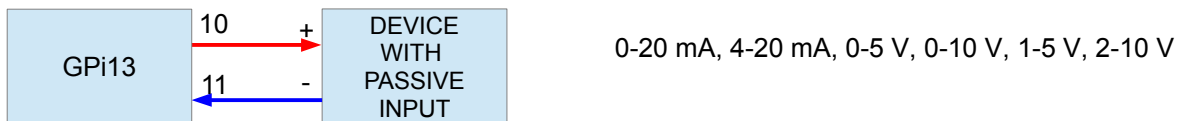
<i>INPUT FREQUENCY RANGE</i>	<i>DIP3 SWITCH IN THE MIDDLE</i>
0 – 10 Hz	
0 – 30 Hz	
0 – 100 Hz	
0 – 300 Hz	
0 – 1 000 Hz	
0 – 3 000 Hz	
0 – 10 000 Hz	
0 – 30 000 Hz	

4.2.2. WIRING AND CONFIGURING THE OUTPUT

4.2.2.1. WIRING THE OUTPUT TO A DEVICE WITH AN ACTIVE INPUT



4.2.2.2. WIRING THE OUTPUT TO A DEVICE WITH AN PASSIVE INPUT



4.2.2.3. DIP SWITCHES RELATED TO THE OUTPUT

<i>OUTPUT SIGNAL</i>	<i>LARGE DIP5 SWITCH</i>	<i>SMALL DIP2 SWITCH</i>
0-20 mA		
4-20 mA		
0-5 V		
0-10 V		
1-5 V		
2-10 V		

5. ORDERING

For ordering please use the G Instruments part number 30209.



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