1D Inclination Switch with 2 switching outputs Preset to +/- 0,5°

GEMAC

IS1A20P34

Features

- **Analog, 1D inclination switch and bang-bang with 2 switching outputs**
  - **typ. 12 V / 2A or typ. 24 V / 2A**
  - **Astable (ON-time adjustable) or monostable (ON, if inclination ≥ threshold adjustable)**
- **Max. adjustable to +/- 2° with potentiometer „window“**
- **switching threshold adjusted to +/- 0,5° with potentiometer „window“**
- **Switching threshold and dead time (optionally also switch-off delay) adjustable with tuning potentiometer**
- **Switching threshold calibration up to +/- 20° with teach-in-function**
- **Suitable for industrial and mobile application:**
  - Working temperature range: -40 °C bis +80 °C
  - Degree of protection: IP65/67
  - MTTF / SIL 2 according to IEC 61508 on request

When reaching a preset inclination, the tilt switch either triggers a switching operation or it is used as a bang-bang servo with adjustable dead time. Switching thresholds and dead time (optionally also switch-off delay) are adjustable by a tuning potentiometer.

A switching threshold of +/- 2° is factory-set or can be adjusted by using the teach-in-function (also asymmetrical). By using the potentiometer, the preset maximum switching thresholds can by de-creased symmetrical to the zero point. The programming directly at the application is to be done with the 2 pushbuttons. Therewith the switching thresholds can also be set asymmtrical. A sub-sequent symmetric decrease of the switching thresholds can be done by tuning the potentiometer.

The configuration of the mono flop time is for each channel individually in the range of 0 s to 32 s. The dead time for both channels is equal and can be set in the range of 0s to 2s.

Potentiometer and push buttons can be accessed after removing the lid. Therefore the 4 screws of the lid must be released.

Applications

- **Inclination monitoring with limits**
- **Machines for agriculture and forestry**
- **Utility vehicles and tail lifts**
- **Cranes and hoisting technology**

Sensors

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Sensorik. Messtechnik. ASIC-Design.

Technical Data:

Signal Parameter (Ta = 40°C ... 80°C)				
	12 V / 2 A		24 V / 2A	
	astable output	monostable output	astable output	monostable output
Measuring range calibrated (1)	-2° ... +2°			
Preset switching thresholds (window adjustment) (2)	-0,5°... +0,5°			
Resolution	typ. 0,1°			
Temperature drift (Zero Point)	0,008°/K ... 0,04°/K , typ. 0,02°/K			
Linearity 25°C	typ. 0,15°, max. 0,25°			
Offset 25°C (Zero Point)	-0,2° ... 0,5°, typ. 0,25°			
Cross sensitivity	max. 5 %			
Switch off delay+	0 s ... 32 s, typ. 15 s	-	0 s ... 32 s, typ. 15 s	-
Switch off delay-	0 s ... 32 s, typ. 8 s	-	0 s ... 32 s, typ. 8 s	-
Dead time	0 s ... 2 s, typ. 0 s			
Power Supply (Ta = 40°C ... 80°C)				
Operating voltage	9 V ... 15 V, typ. 12 V		15 V ... 30 V, typ. 24 V	
Operating current (3)	40 mA ... 60 mA			
Operating current under short circuit of output	max. 2A			
Output signal (Ta = 25°C)				
Operating current	2 A ... 3 A			
Operating voltage(4)	supply voltage			
Environment Parameters				
Operating temperature	-40 °C ... 80°C			
Storage, transportation	-40 °C ... 85 °C			
Degree of protection	IEC 529 IP65			
Humidity	90 % RH non-condensed			
Shock (sensor element)	max. 3500 g			
Shock (sensor complete)	IEC 68-2-29 halfsinusoidal, 25 g, shock duration 6 ms, 1000 cycles			
Vibration	IEC 68-2-6 sinus vibration, acceleration 3 g, 10 - 500 Hz, frequency 1 octave/min, 2 h per axis (x,y,z)			
EMV				
Emission	EN 55011 group 1class A; EN 50081 – 1			
Immunity	EC 61000-4-4 (Burst) Level 3; IEC 61000-4-5 (Surge) Level 1			
ESD	EC 61000-4-2 Level 3 Direct ±6 kV; Air ±8 kV; **Functional status: Class A**			
Conformity in accordance with RL 2004/108/EC CE				

(1) Switching thresholds calibratable in range of +/- 20° ex factory or with Teach-in "Window"-potentiometer at maximum (right stop in clockwise direction); (2) Factory setting; (3) without switching current; (4) depends on switching current and supply voltage*

*The manual contains a complete description of the technical data (www.gemac-chemnitz.de).

Ordering Information:

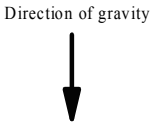
Product	Description		Item Number
IS1A20P22	Inclination switch astable; 12 V / 2A	Dimensions (L x B x H in mm): 115 x 65 x 30 Weight: 250 g Housing: aluminium	PR-24009-00
IS1A20P23	Inclination switch monostable; 12 V / 2 A		PR-24009-10
IS1A20P32	Inclination switch astable; 24 V / 2 A		PR-24014-00
IS1A20P34	Inclination switch monostable; 24 V / 2A		PR-24014-10

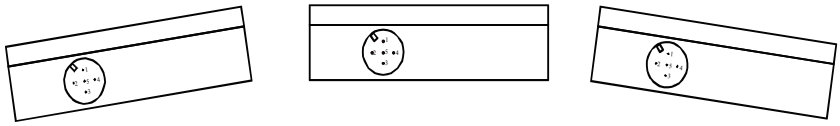
Electrical connection:

5- pole M12 Sensor- Actor- male connector, IEC 61076-2-101, IEC 60947-2
min. locking torque 0,9 Nm

Installation:

Mounting: Screw mounting





Connector Allocation			
Pin	**Color**	**Symbol**	**Description**
1	brown	U_{CC}	power supply
2	white	OUT +	output switch + direction
3	blue	GND	ground
4	black	OUT -	output switch + direction
5	green		do not connect

Dimensions:

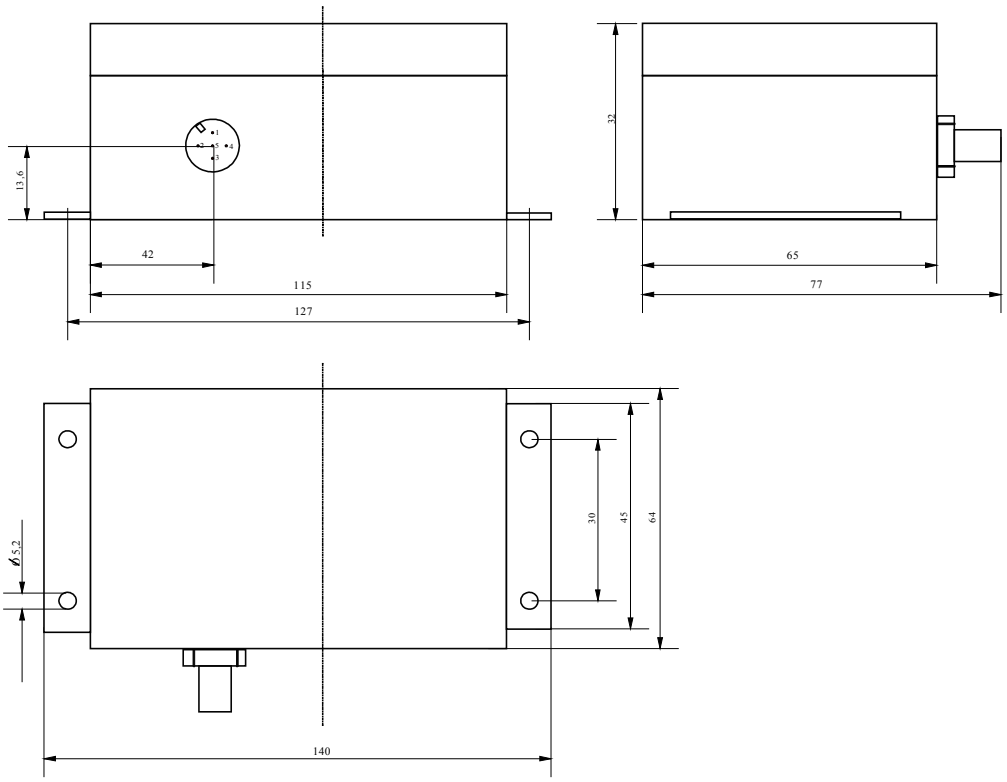


Abbildung 1: Dimensions in mm

Threshold Setting:

- Potentiometer ”window“ to be turned to maximum (in clockwise direction all the way to the stop)
- Function- selection- input Pin5, (green) to be connected to GND
- Keep S1 (left pushbutton) pressed before and during connecting to the power supply

  Vcc=24V (Pin1, brown) ; GND (Pin3, blue)
- If the LED on the PCB starts flashing, release pushbutton S1
- Turn sensor to - x° direction
- Press S2 (right pushbutton) until LED lights up statically
- Turn sensor to + x° direction. The LED starts flashing.
- Press pushbutton S1 on the PCB until LED lights up statically
- Turn sensor to + 0° direction. The LED remains OFF.
- Remove GND potential from function- selection- input Pin5 (green)
- Switch OFF power supply.