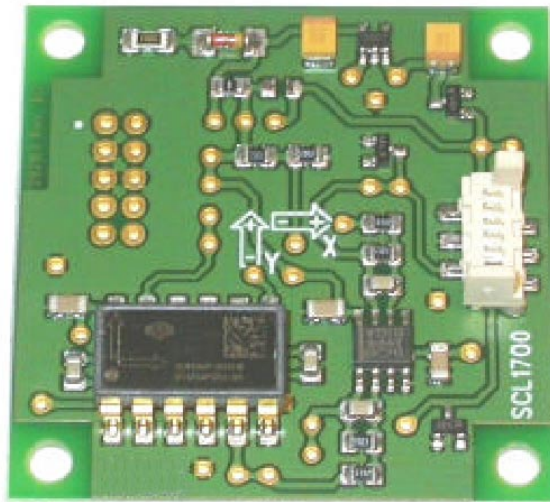


**SCL1700-D01  
PRODUCT SPECIFICATION**

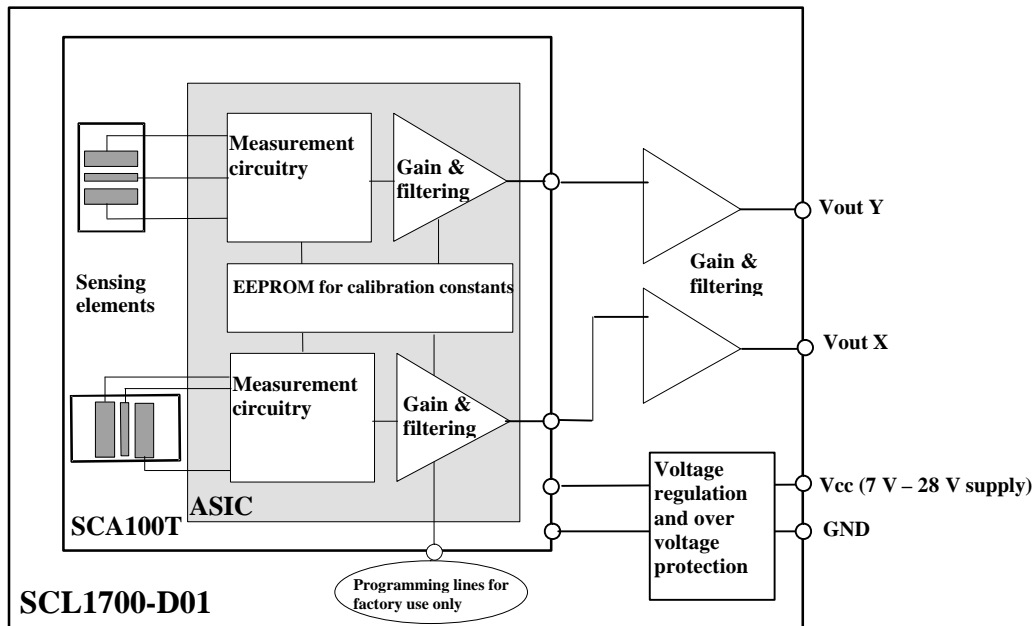


## 1 General description

This document describes an inclination module, suitable for various industrial applications. Inclinator is available in 2 axis configuration. The sensor used is a standard inclinometer component SCA100T-D01. Output interface is analogue voltage.

### 1.1 Block diagram

Products are based on SCA100T-D01 components, mounted on PCB. Electronics are not encapsulated.



### 1.2 Inclinator Features

- Measuring range:  $\pm 10^\circ$
- Controlled frequency response
- Easy to use and design in
- High resolution analogue output
- Dual axis inclination measurement
- Advanced failure detection
- Wide supply voltage range

#### Benefits

- Excellent long term stability
- Outstanding shock durability
- Harsh environment robustness
- Fit, form and function compatible with commonly used 45 x 45mm dual axis inclination board

## 2 Electrical specifications

### 2.1 Electrical Connection

Connector: Molex, Picoflex PF-50, see picture 2.

Name	Function	Connector pin #
V <sub>CC</sub>	Power supply	1
NC	Internally not connected	2
GND	Ground	3
Out X	Analogue X-direction output	4
Out Y	Analogue Y-direction output	5
NC	Internally not connected	6

### 2.2 Absolute maximum ratings

Parameter	Condition	Min.	Typ	Max.	Units
Supply voltage		6		35	V
Current consumption	No load		4.5	7	mA
Output load	Resistive	30	50		kΩ
	Capacitive			20	nF
Storage temp		-40		125	°C
Operating temp		-25		85	°C
Mechanical shock	1m drop on concrete		20 000		g

### 2.3 Electrical Specification

Parameter	Condition	Min.	Typ	Max.	Units
Supply voltage		7		35	V
Measuring range <sup>(1)</sup>			± 10		°
Offset <sup>(2,3,4)</sup>	Output @ 0°		2.5 ± 0.02		V
Offset calibration point error <sup>(3,4,5)</sup>			± 0.1		°
Offset temperature error <sup>(3,4,6)</sup>	0°C...70°C		± 0.2		°
	-25°C...85°C		± 0.5		°
Sensitivity <sup>(3,4,7)</sup>	@ 0° (offset position)	198	200	202	mV/°
Sensitivity calibration error <sup>(3,4,8)</sup>				1%	%
Sensitivity temperature error <sup>(3,4,9)</sup>	0°C...70°C		± 0.5		%
	-25°C...85°C		± 1.0		%
Nonlinearity <sup>(10)</sup>	Sine fitting		± 0.03		°
Frequency response -3dB	True DC response		3		Hz
Output noise DC... 10 Hz	@ 0° (offset position)		< 0.001		°

Note 1. The measuring range is limited by sensitivity, offset and supply voltage rails of the device.

Note 2. Offset specified as V<sub>offset</sub> = V<sub>out</sub>(@0°) [V].

Note 3. +15V supply voltage used in calibration and testing.

Note 4. See proposed connection of SCL1700 in picture 2.

Note 5. Offset calibration error specified as  $\text{Offset\_Calib\_error} = \arcsin(\text{Offset\_Calib\_error\_in\_g}) [^\circ]$ ,

$\text{Offset\_Calib\_error\_in\_g} = \{V_{out}(@0^\circ) - 2.5\text{ V}\} / V_{sens} [g]$ ,  $V_{sens}=11.46\text{ V/g}$ .

Note 6. Offset temperature error specified as  $\text{Offset\_Error\_@\_temp.} = \arcsin(\text{Offset\_Error\_@\_temp\_in\_g}) [^\circ]$ ,

$\text{Offset\_Error\_@\_temp\_in\_g} = \{V_{out} @ \text{temp.} - V_{out} @ \text{room temp.}\} / V_{sens} [g]$ ,  $V_{sens}=11.46\text{ V/g}$ .

Note 7. Sensitivity target in calibration 11.46 V/g (→ 200 mV/°)

Sensitivity specified as  $V_{sens} = \{V_{out}(@+10^\circ) - V_{out}(@-10^\circ)\} / (2 \cdot \sin(10^\circ) [g]) [V/g]$ .

Note 8. Sensitivity calibration error specified as  $\text{Sensitivity\_calibr\_error} = \{V_{sens} - V_{sens\_nom}\} / V_{sens\_nom} \times 100\% [^\circ]$ ,

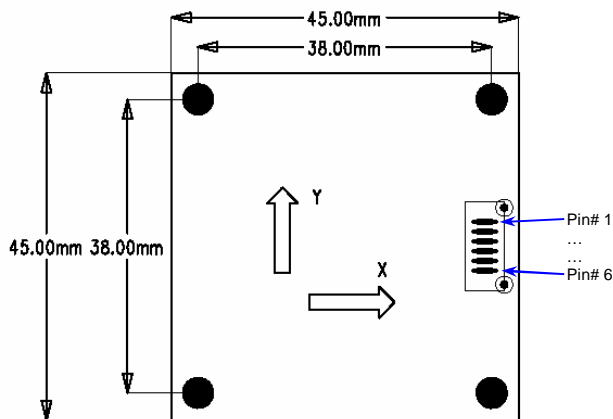
$V_{sens\_nom}$  = nominal sensitivity.

Note 9. Sensitivity temperature error specified as

$\text{Sensitivity\_temp\_error} = \{V_{sens} @ \text{temp} - V_{sens} @ \text{room temp}\} / V_{sens} @ \text{room temp} \times 100\% [^\circ]$ .

Note 10. From best fit sine-function to output through -10° and +10°.

### 3 Mechanical specification



- PCB Material: FR4
- PCB thickness: 1.6 mm
- Size: 45 mm × 45 mm
- Mounting holes:  $\varnothing$  3.5 mm
- Height: max 10 mm
- Weight: < 10 g
- Connector: Molex, Picoflex PF-50, 1.27mm pitch, mates with Molex 90327

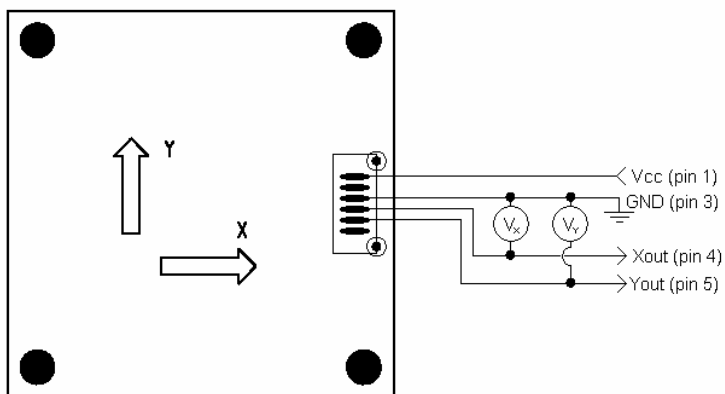
Picture 1. SCL1700-D01 mechanical dimensions.

### 4 Mounting

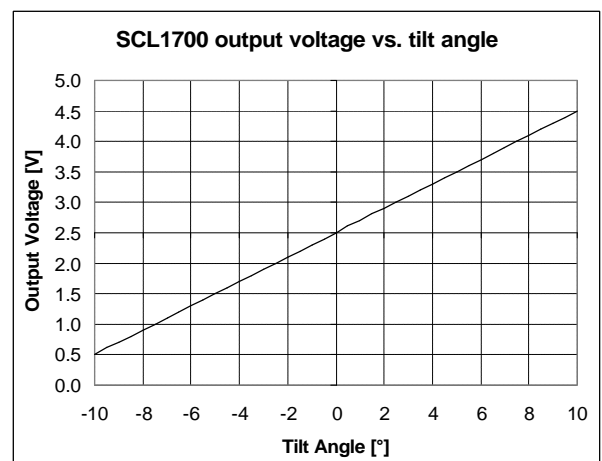
The sensor module is to be mounted with 4 screws, dimension M3.

### 5 Connection and output signal

Proposed connection in applications.



Picture 2. Proposed connection for SCL1700-D01.



Picture 3. SCL1700-D01 output signal.