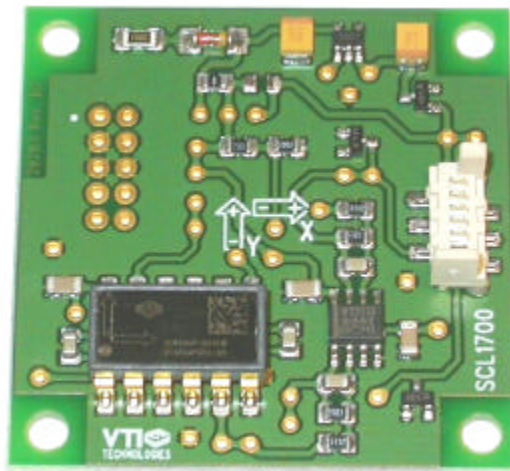


SCL1700-D01 PRODUCT SPECIFICATION

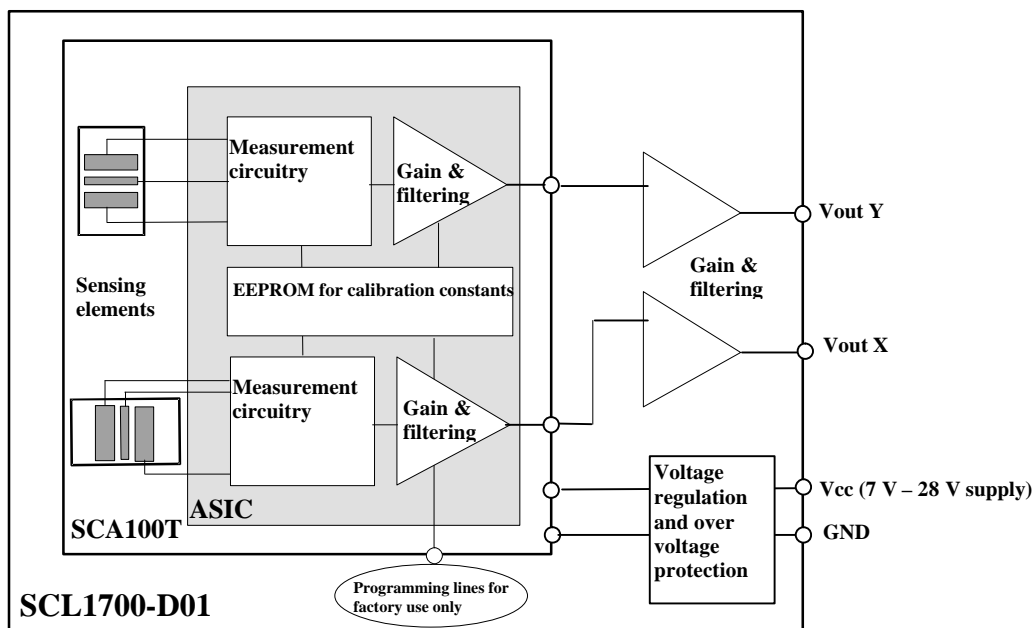


1 General description

This document describes an inclination module, suitable for various industrial applications. Inclinometer is available in 2 axis configuration. The sensor used is a VTI 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 Inclinometer 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 _{CC}	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 ⁽¹⁾			± 10		°
Offset ^(2,3,4)	Output @ 0°		2.5 ± 0.02		V
Offset calibration point error ^(3,4,5)			± 0.1		°
Offset temperature error ^(3,4,6)	0°C...70°C		± 0.2		°
	-25°C...85°C		± 0.5		°
Sensitivity ^(3,4,7)	@ 0° (offset position)	198	200	202	mV/°
Sensitivity calibration error ^(3,4,8)				1%	%
Sensitivity temperature error ^(3,4,9)	0°C...70°C		± 0.5		%
	-25°C...85°C		± 1.0		%
Nonlinearity ⁽¹⁰⁾	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 $V_{offset} = V_{out}@0°$ [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 $Offset_Calib_error = \arcsin(Offset_Calib_error_in_g) [°]$,
 $Offset_Calib_error_in_g = \{V_{out}@0° - 2.5 V\} / V_{sens} [g]$, $V_{sens}=11.46 V/g$.

Note 6. Offset temperature error specified as $Offset_Error_@_temp = \arcsin(Offset_Error_@_temp_in_g) [°]$,
 $Offset_Error_@_temp_in_g = \{V_{out} @ temp. - V_{out} @ room temp.\} / V_{sens} [g]$, $V_{sens}=11.46 V/g$.

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

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

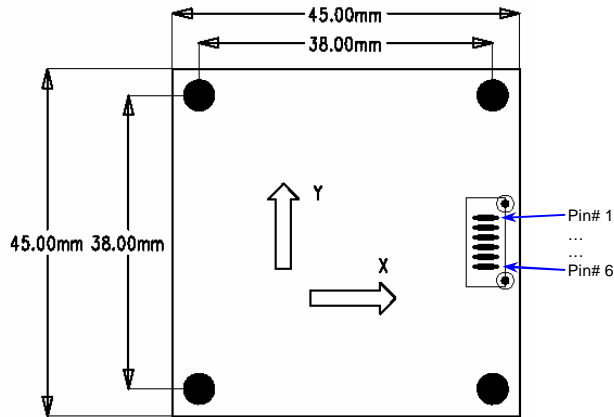
Note 8. Sensitivity calibration error specified as $Sensitivity_calibr_error = \{V_{sens} - V_{sens_nom}\} / V_{sens_nom} \times 100\% [%]$,
 V_{sens_nom} = nominal sensitivity.

Note 9. Sensitivity temperature error specified as

$Sensitivity_temp_error = \{V_{sens} @ temp - V_{sens} @ room temp.\} / V_{sens} @ room temp \times 100\% [%]$.

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

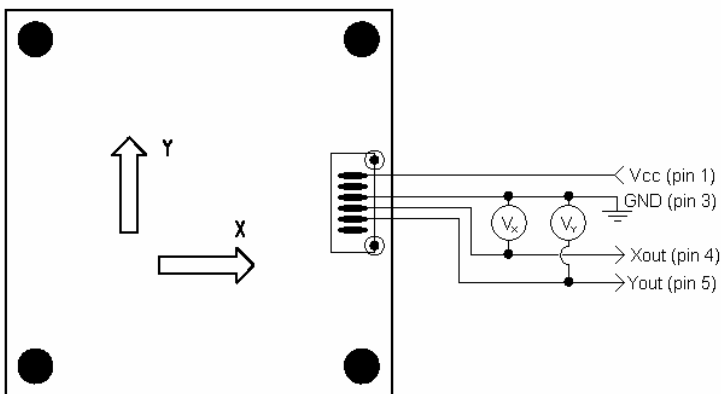
Picture 1. SCL1700-D01 mechanical dimensions.

4 Mounting

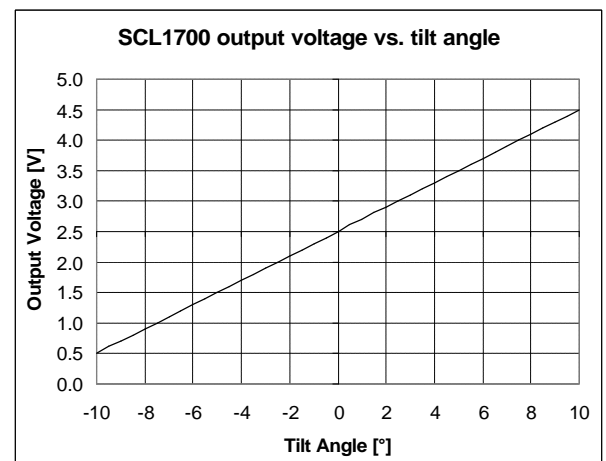
The sensor module is to be mounted with 4 screws, dimension M3.

5 Connection and output signal

Proposed connection in applications.



Picture 2. Proposed connection for SCL1700-D01.



Picture 3. SCL1700-D01 output signal.