inclination sensor F99

Jens Scherer
product management

PEPPERL+FUCHS

new technology at P+F

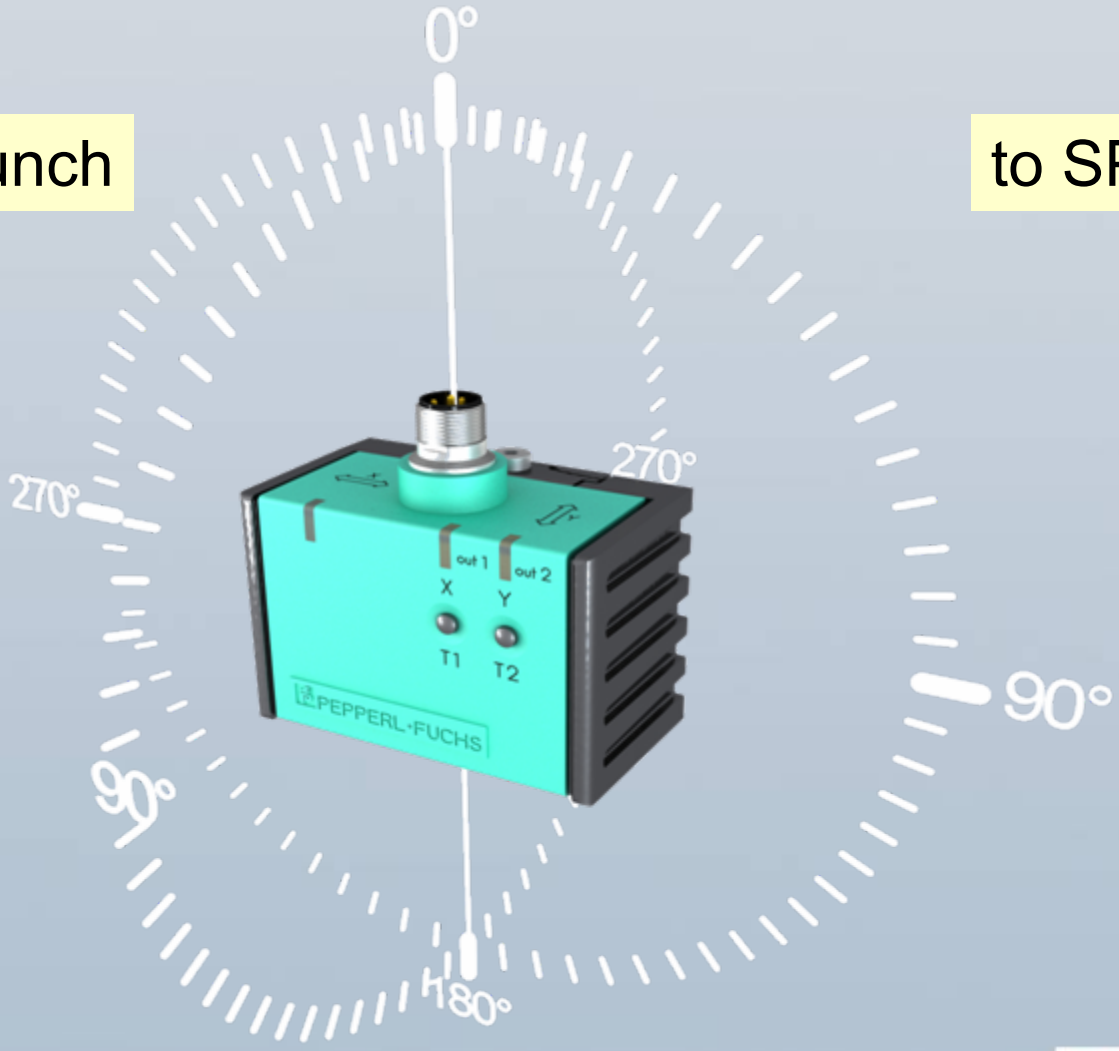
Pepperl and Fuchs is going with a new technology on the market

1. Proximity Switches ind, cap, mag
2. Photoelectric Sensors
3. Industrial Vision
4. Ultrasonic Sensors
5. Rotary Encoders
6. Positioning Systems
7. AS – Interface
8. Identification Systems
9. Logic control units
10. Electrical / Mechanical systems
11. Inclination Sensors

F99 measuring angles of inclination

market launch

to SPS 2007



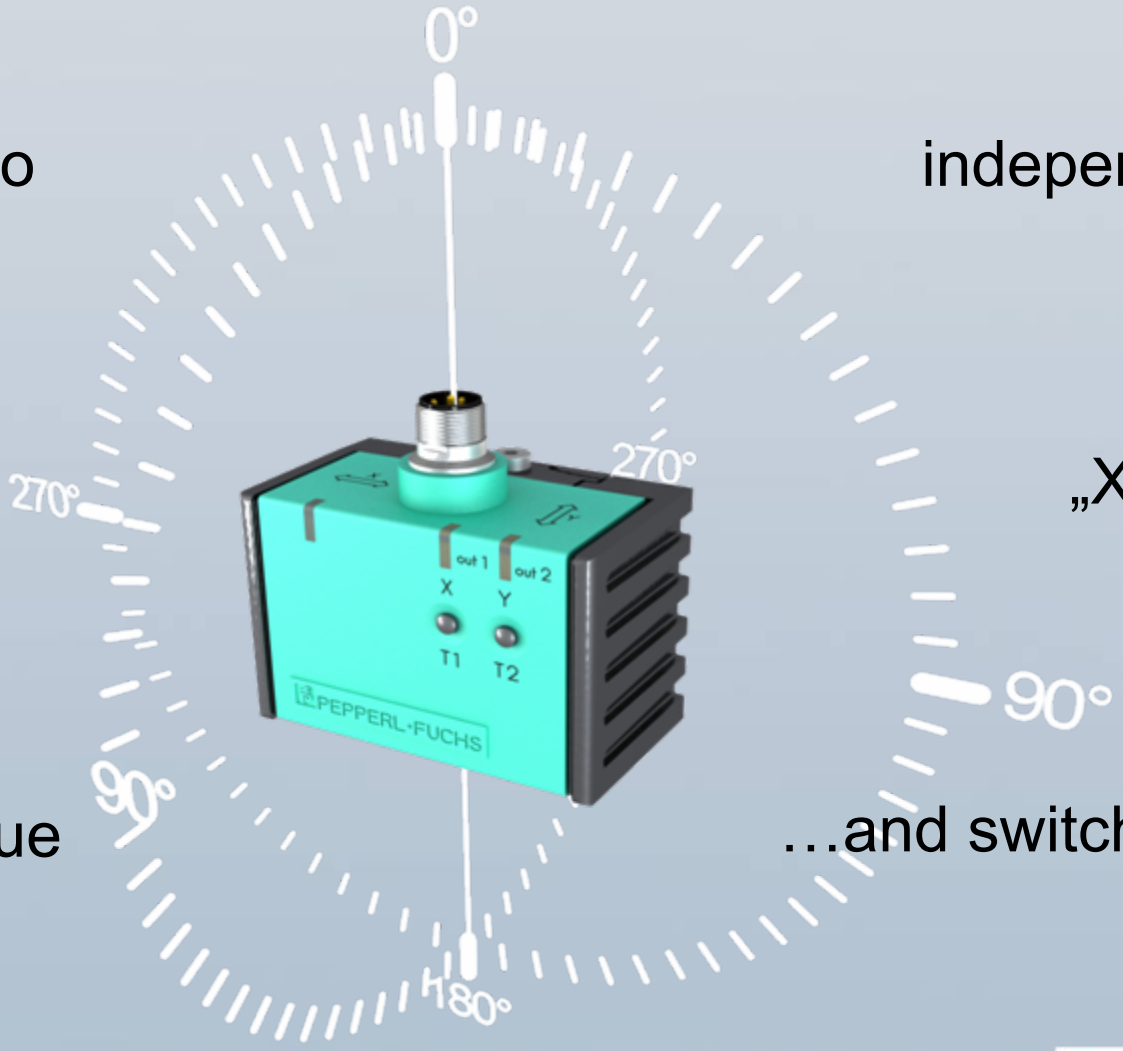
F99 measuring angles of inclination

…up to two

independent axles

„X“ …

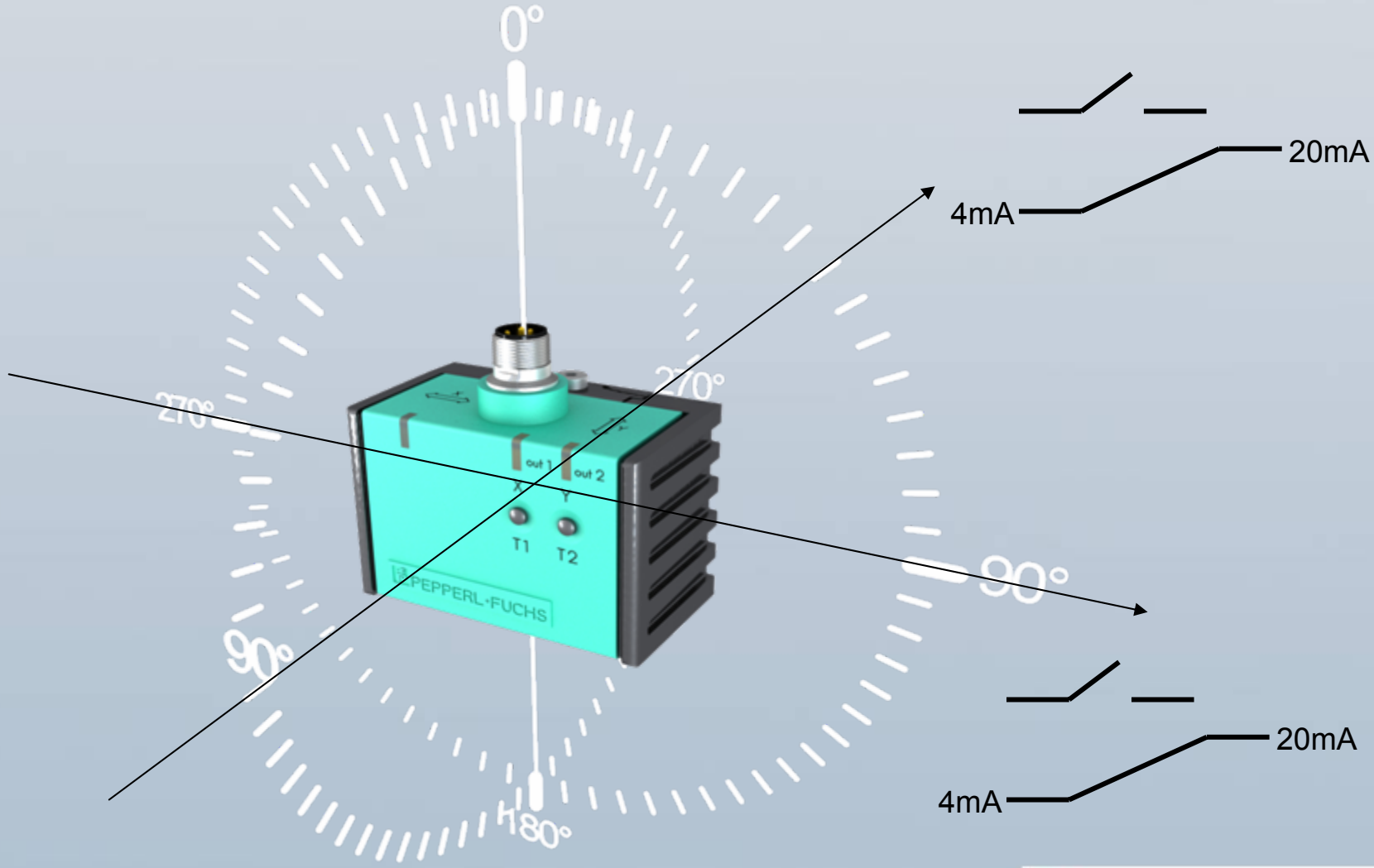
„X und Y“



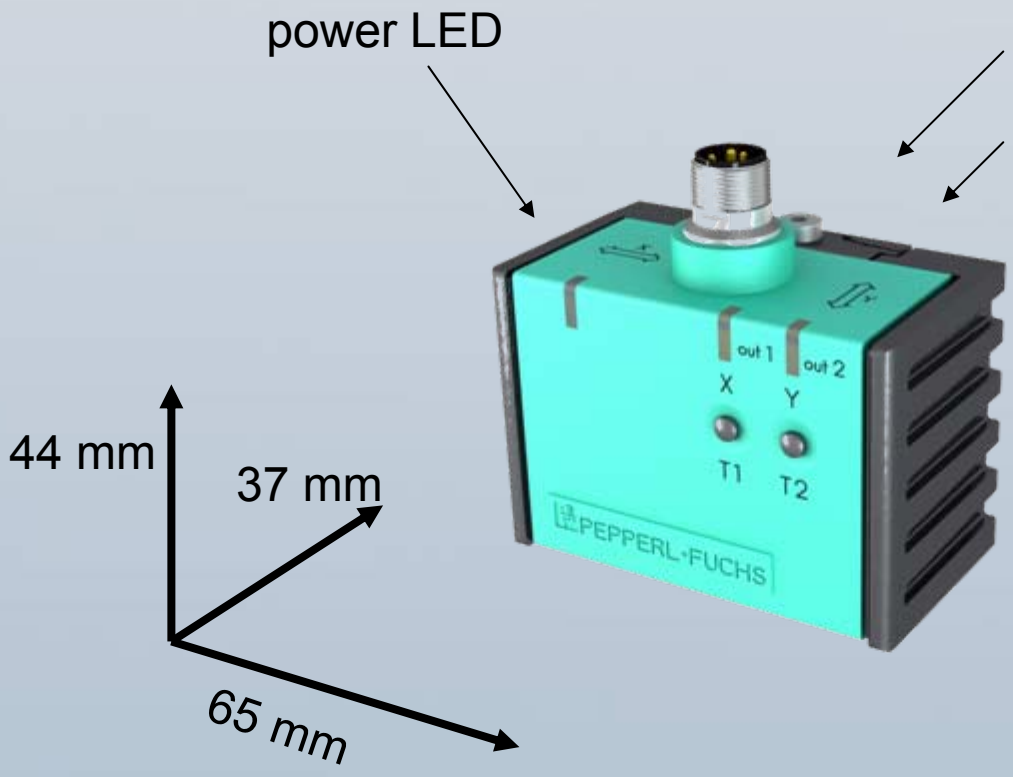
with analogue

…and switching outputs

F99 measuring angles of inclination



F99 preface



T1 = teach button out1 (X-axle)
analogue out (X-axle)
T2 = teach button out2 (Y-axle)
analogue out (Y-axle)

F99 preface

sensor element can be removed from mounting bracket by central screw

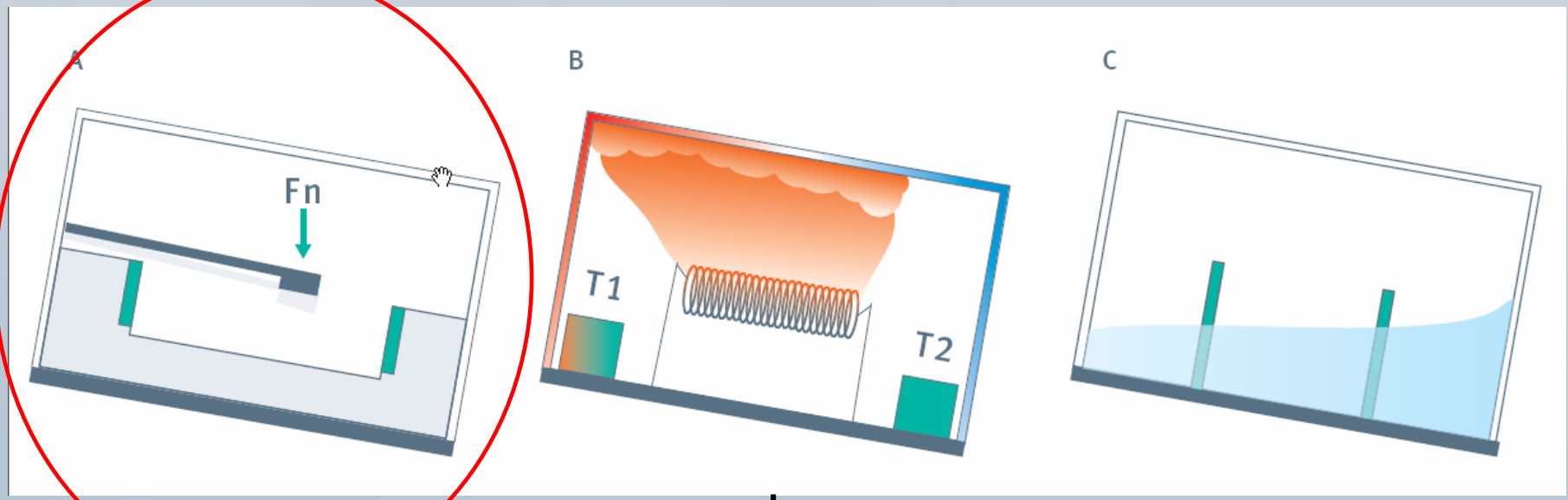
protection class
IP68 / IP69K

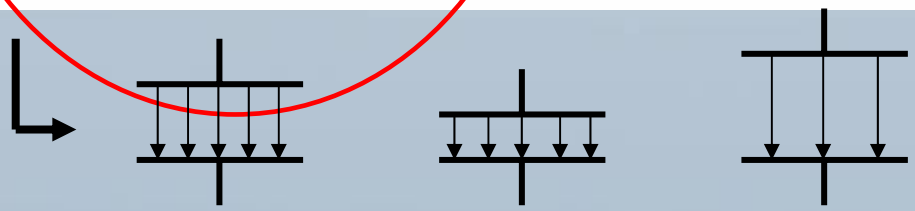
temp. range
-25 … +85°C

F99 functional principles

there are existing 3 basic measuring principles:

A: spring – mass - system **B:** thermal technology **C:** fluid system





advantages – and disadvantages of technologies

technology	advantage	disadvantage
micromechanics	-four big manufacturer -fast <1000Hz	-lower shock resistance -self vibrancy typ. 1,5k-6kHz -mechanical clipping
thermal	-high shock resistance -now self vibrancy -low vibration sensitivity	-Only one big manufacturer -slow <20Hz
with fluid	-high resolution -now vibration sensitivity	-expensive z.B. HL-Planar 30€ -big design -no manufacturer for 360° sensor-elements

type designation

INY360D – F99 – 2I2E2 – V17

connection:
V17 = M12x1 8 pins
V15 = M12x1 5 pins
V1 = M12x1 4 pins
5M = 5 meter cable

I=current output 4-20mA
(U=voltage output 0-10VDC)
E2=PNP, N.O.
B16=CAN open

F99 = housing

INY360D = inclination 2 axis 360°
INX360D = inclination 1 axle 360°

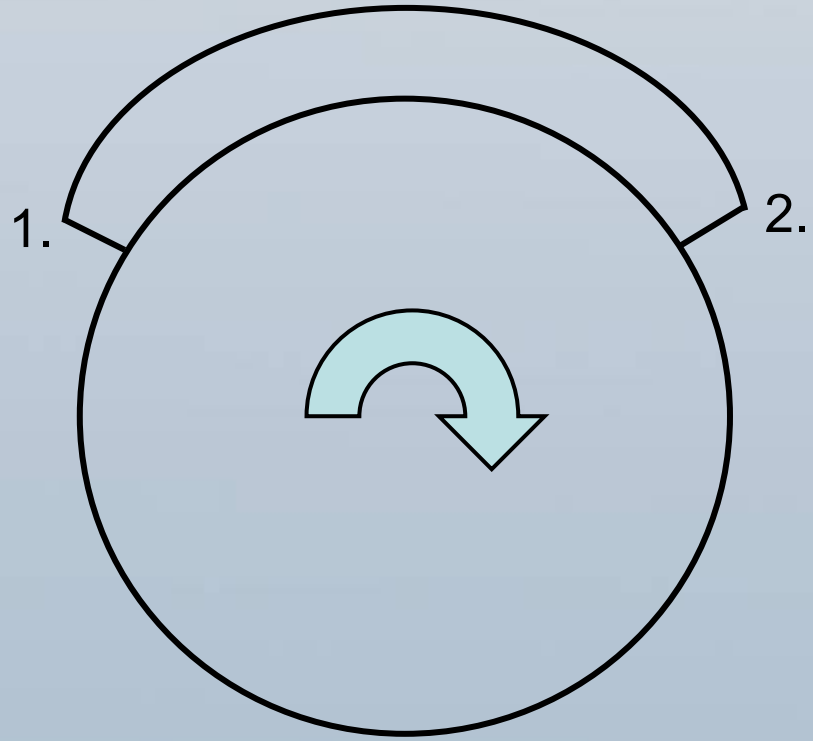
technical data

- measuring range: 0…360°
- axis: 1 or 2
- abs. accuracy: ± 0,5° at room temperature. (Abweichung0,027° / K)
- repeat accuracy: ± 0,1°
- switching hysteresis: typ. ±0,5°
- sensitivity: ± 0,1°
- temperature range: -25 – 85°C
- IP68, IP69K protection class II, e1 certification (August 2008)
- 2 PNP (N.C. / N.O.) output with teachable switching points
- 2 analogue outputs (4-20mA)
- CAN Open interface (4.Q. 2008)

teach in procedure

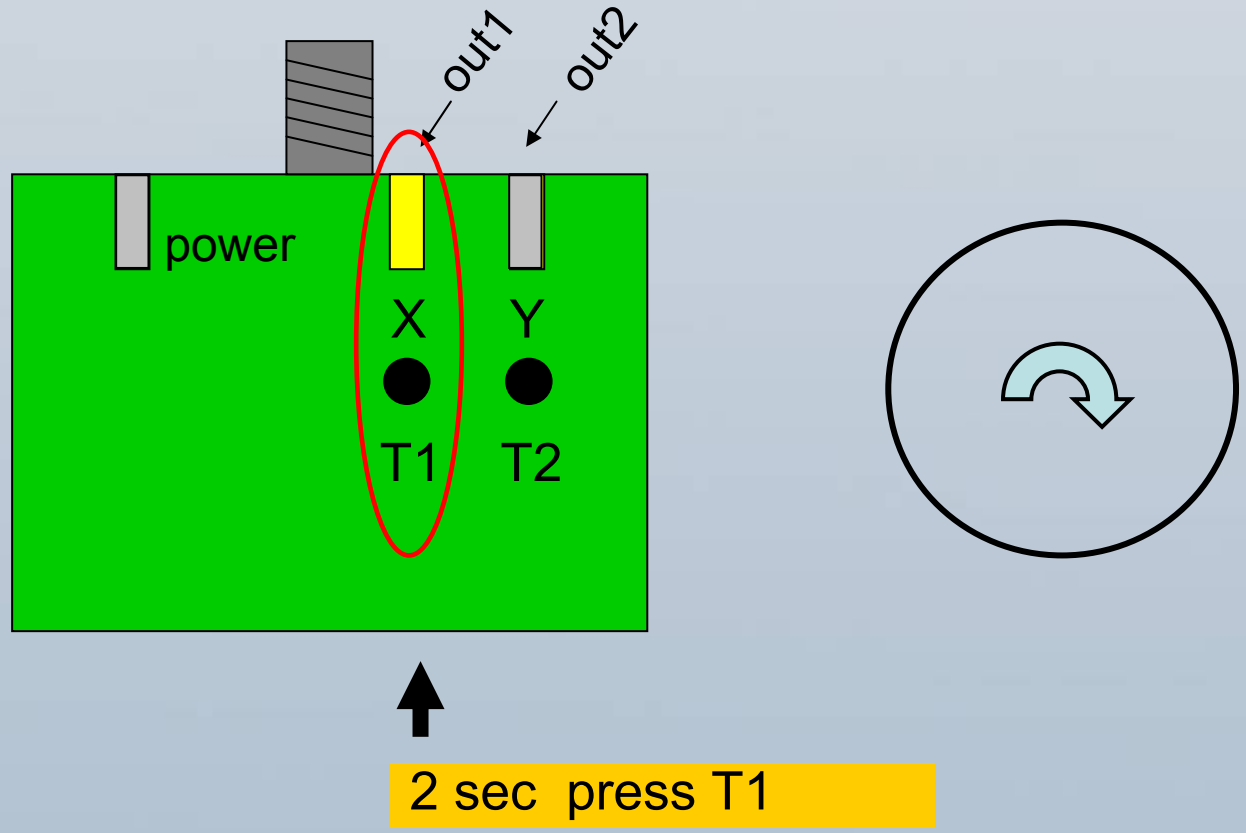
You want to teach in a switching range from

1. - 45° to
2. +45° …at the X axle



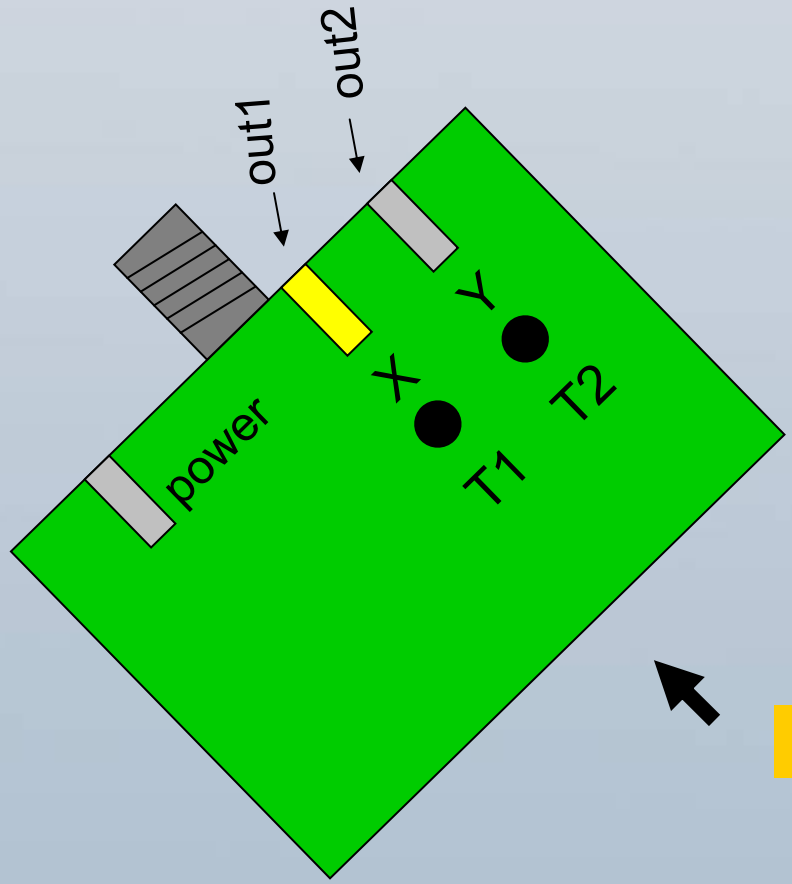
teach in procedure

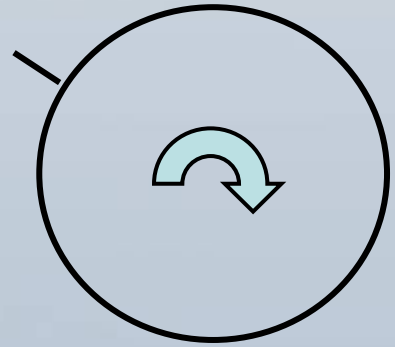
1) activate the teach mode of the X-axle



teach in procedure

2) turn sensor to -45° position

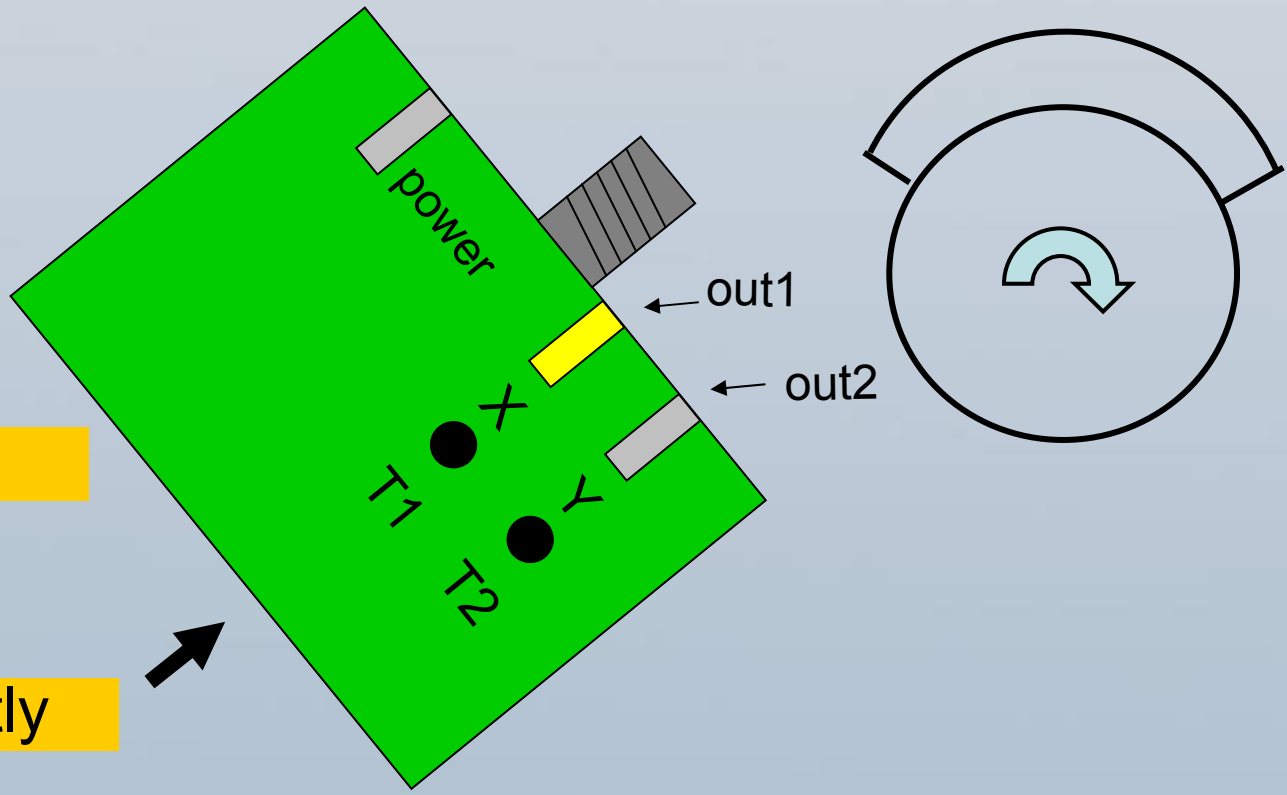




press T1 shortly

teach in procedure

3) turn sensor to +45° position



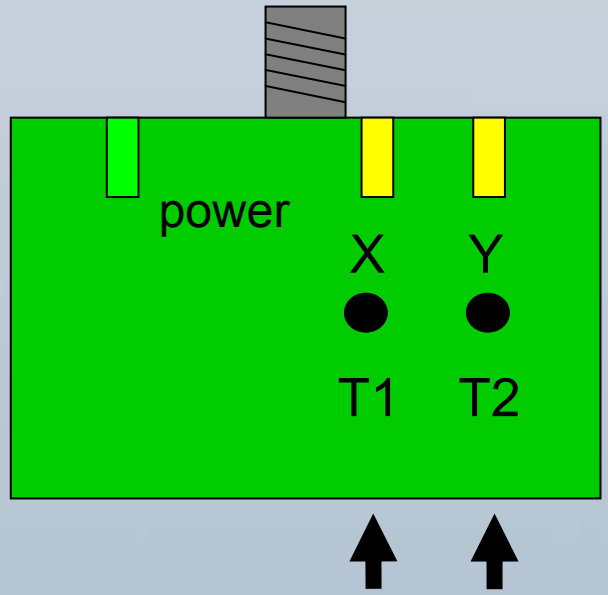
ready!

…in only 3 steps

press T1 shortly

teach in procedure

- same applies to the teach in of the Y-axle (T2)
- to teach in the analogue evaluation points: change mode…

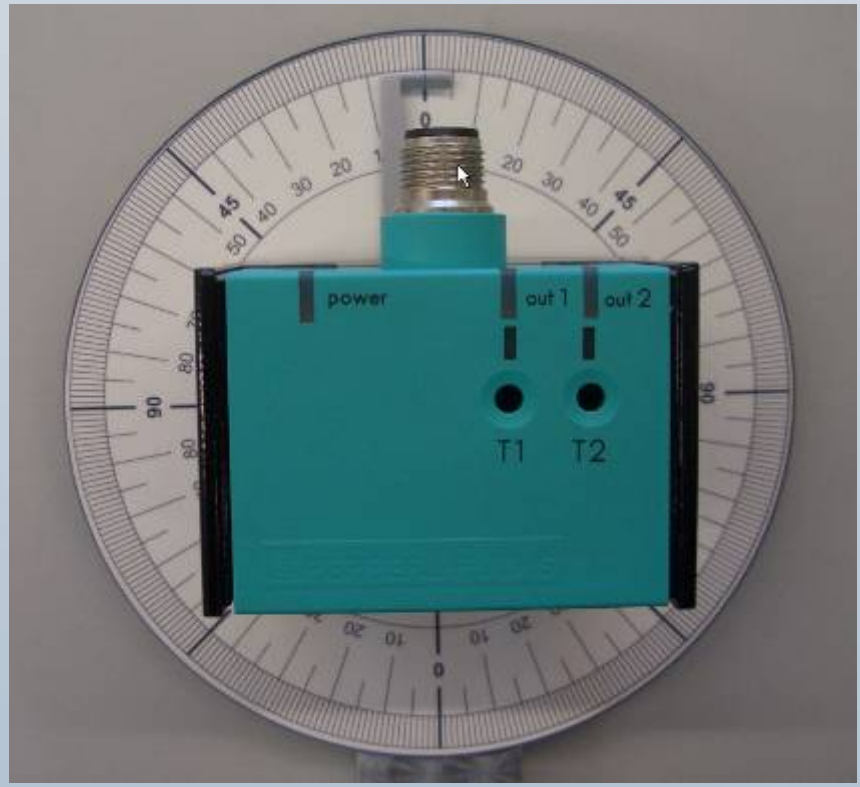


…further more like the teach in procedure of the switching points

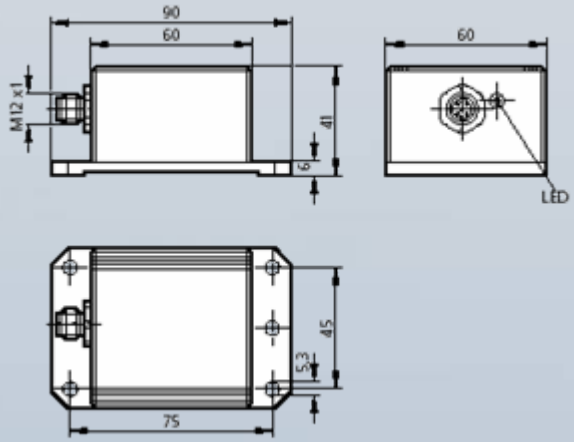
…press T1 and T2 for 2 sec…

teach in procedure

a goniometer will be available soon as an accessory

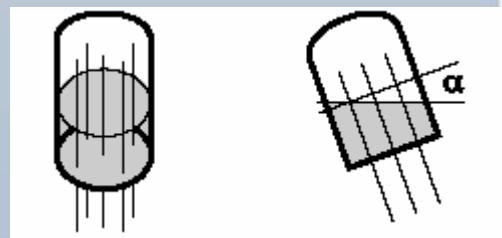


competitive products Fa. ifm



short description

Inclination sensor with fixed measuring range of + / - 45° in X- and Y-direction.
Fluid sensor



competitor Fa.ifm

CR 2101

CAN-interface
± 15°
2-axis
10...32 V DC

list price: 428,30 €

CR 2102

CAN-interface
analogue outputs
4...20 mA
± 45°
2-axis
10...32 V DC

list price: 472,20 €

competitor Fa.Fraba

CANopen & Device Net: 5°, 15°, 30°

Profibus: 5°, 15°, 30°

POSITAL FRABA

CANopen 0…360°

target of promoting the new F99 end of 2007

- collecting of applications
- searching for customers where we can test special functionalities

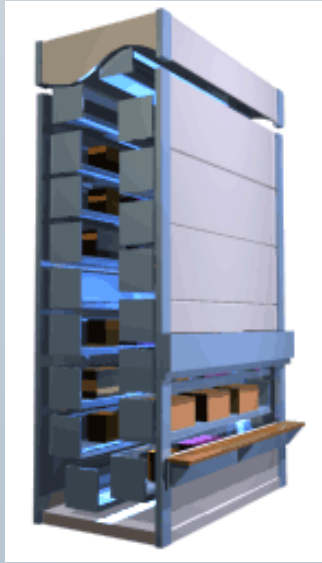
imaginable applications

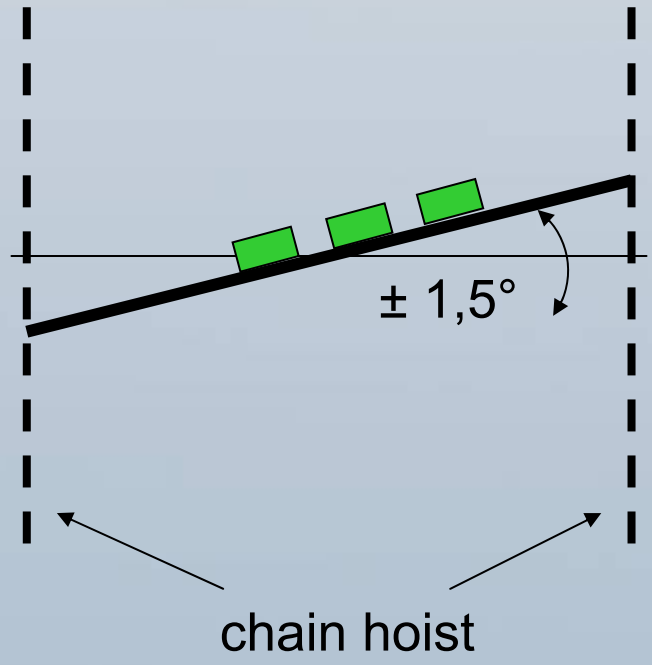
company Ades (Spain) applies the PMI360D to control the rotation of solar panels at the moment. (3000 pcs/year.)

An inclination control is imaginable

imaginable applications

company Megamat (D) is testing to control the inclination of tableaus of stock paternoster





deviation of inclination
max. ± 1,5°

imaginable applications

declination and acceleration of wind energy masts

In case of exceeding the limit of declination or acceleration of the mast the rotor can be turned automatically out of the wind.

imaginable applications

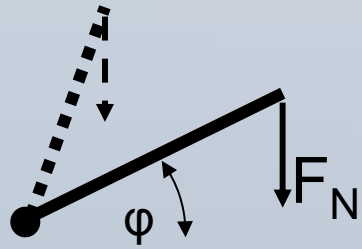
company U-Lift is asking at the moment for:
inclination measuring of board lifts and ramps

attention!! e1 approval until August 2008

imaginable applications

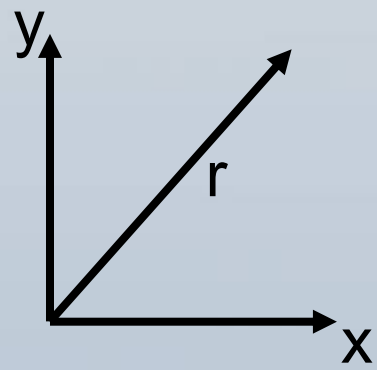
common use in commercial vehicles

attention: e1 approval and CAN bus version!



customer specific adaptions are possible

- preset of evaluation range
- Housing without teach button
- Analogue voltage output
- PNP or NPN outputs
- measuring of acceleration
- output of resulting force
- …



appropriate product specialist: Jürgen Becker

product manager: Jens Scherer

sales arguments

- analogue - and switching outputs
- free set of evaluation points
- no restriction of predetermined angels for example ± 45° or ± 90°
- easy and simple set up by teach in buttons
- Outdoor – suitable, robust housing IP68 / IP69K