KATSURA OPTO SYSTEMS

The world's first innovation & production of probity

Ultra-compact tilt sensor TM-2070 & TM-2090

Precision measurement is not just about removing variability,

it is also opening up new possibilities.

A partner of non-contact Optics Measurement **“TM-2070”**

Welcome!

Katsura Opto Systems is the world’s No.1 optics R&D company with deep and rich knowledge and many technical engineers.

Always, Anywhere, Easily

Measurement equipment must raise results and lead the most precise results. Katsura Opto Systems fundamentally believes that this leads to good manufacturing products.

For the Highly Accurate Measurement

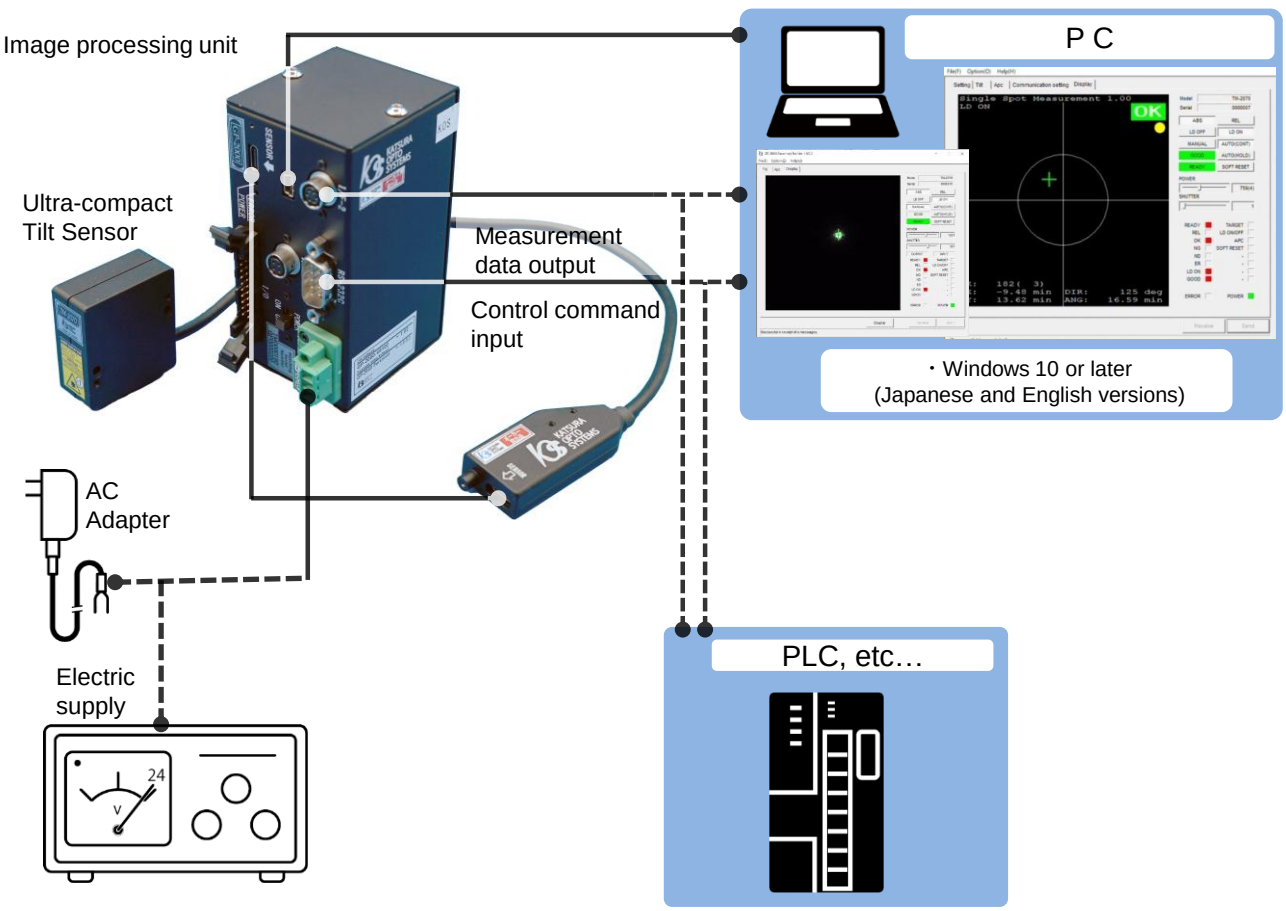
We have a good and strong policy, that is productivity, manufacturability, and technical improvements day by day to deliver our products to the world.

Good products bring good results of expand market share and contracts.

Features

Smallest, Stylish and Simple.

1. System



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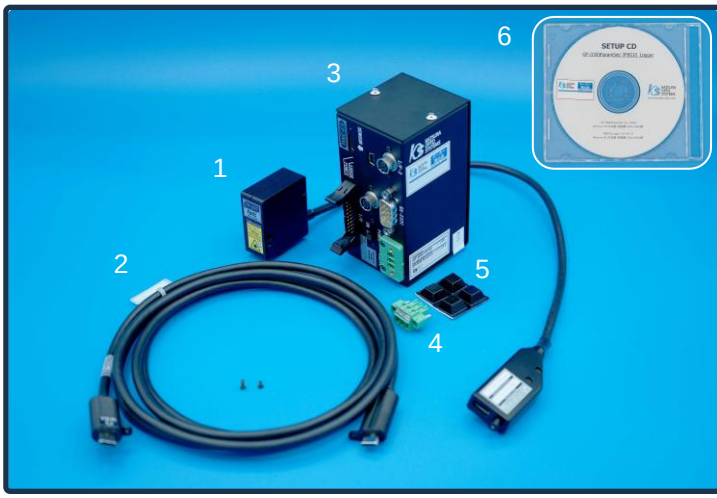
2. Configuration



1. Sensor / TM-2070
2. Sensor cable (1m) / KE-0059
3. Image processing unit / GP-2000
4. Connector / FH-0022
5. Rubber feet / BMC0002
6. CD-ROM (software) / GP-2000CD

Option

1. RS-2320 cable
・KE-2110

Connects to external devices to send and receive data.

2. DIN rail fitting plate
・TO-0006

Used to install the imaging unit on a DIN rail.

3. AC adapter
・FH-0023

Used to drive the device. Not required if a separate power supply is provided.

4. sensor cable (2m)
・KE-0060

These are different lengths of the sensor cables that are included.

5. USB cable (Mini-B)
・KE-0014

Used to visually check the camera image of the tilt sensor on a PC.

6. Tilt Adjuster
・TO-7900

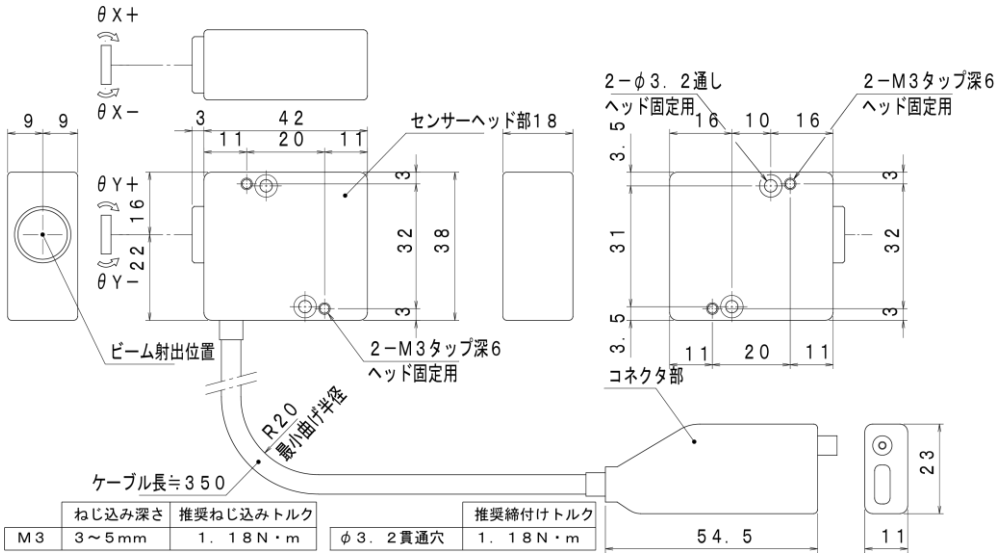
Install the tilt sensor. The angle can be fine-tuned with the adjustment screw. M6 tapped holes are provided on the main body. *Refer to the end of this document for details.

3. Specification

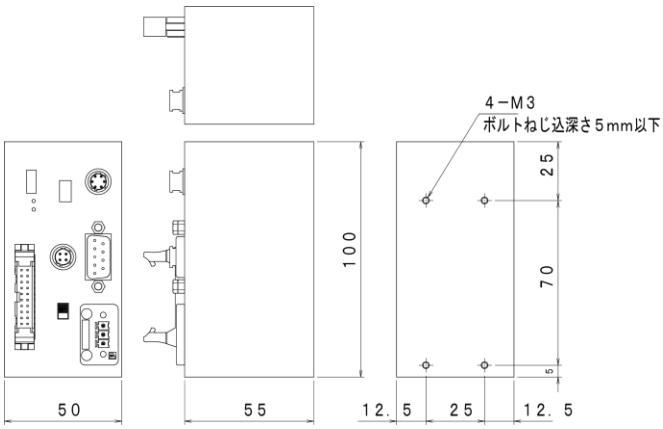
Model		TM-2070	TM-2070-C001	TM-2090
Measurement sample		Optical plane (reflectance 0.5% more)	Optical plane (reflectance 0.005% more)	Optical plane (reflectance 0.5% more)
Measurement type		Tilt (θX,θY)		
Working distance		0-110mm +/-70min (Circular range) 0-170mm +/-45min (Circular range) 0-250mm +/-30min (Circular range)		0-85mm +/-90min (Circular range) 0-110mm +/-70min (Circular range) 0-170mm +/-45min (Circular range) 0-250mm +/-30min (Circular range)
Measurement area	Tilt(θX, θY)	+/-70min (Circular range)		+/-90min (Circular range)
Repeatability*1		1sec		1.3sec
Linearity*2		+/-0.25% of F.S. (+/-0.35min)		+/-0.25% of F.S. (+/-0.45min)
Source	Wavelength*3	650+/-10nm		
	Beam class	JIS C6802 2014 class 2		
	Beam diameter	Φ1mm*4	Φ0.5mm*5	Φ1mm*4
Digital In & Out	HIROSE: HR10A-7R-6S D-Sub 9pin male*6	Data output (60times/sec) *7, FA command input		
	Mini USB (Type-B)	Image processing out*8		
	omron XG4A-2304	IN: TARGET, LD ON/OFF, APC, SOFT RESET OUT: READY, REL, OK, NG, ND, ER, LD ON, GOOD		
Power input		DC+24V+/-10%		
Power consumption		Max 15W		
Size (Without Protrusions)		W38xD42xH18mm / GP-2000: W50xD55xH100mm		
Weight		TM-2070, TM-2090: 0.1kg / GP-2000: 0.3kg		

*1 W.D. 50mm setting, 6σ, camera (PK) 180
*2 W.D. 50mm setting → gap indication.
*3 If you require a wavelength of blue (405nm), green (520nm), infrared (780nm, 850nm, 904nm, 1064nm), etc., we can propose a compact tilt sensor (RA series). Please contact us for details.
*4 Sensor Immediately after radiation diameter. ($1/e^2$)
*5 W.D. 50mm→ Beam diameter. ($1/e^2$) product No: TM-2070-C001 (size, weight=TM-2070)
*6 In use USB port, →SANWA supply (USB-CVRS9HN) recommendation.
*7 When outputting continuous data (communication command $START), command or by setting the band rate. Continuous data output is not possible on two ports simaltaneously.
*8 If it use a 「GP-2000 Paramset」 of configuration of software, a able to see a camera image vision.

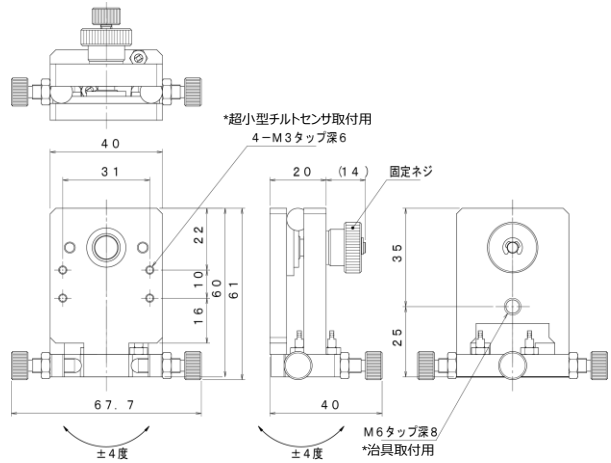
4. Drawing TM-2070, TM-2070-C001, TM-2090



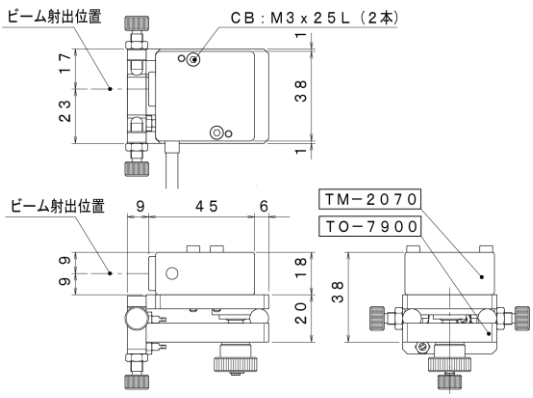
・Image processing unit / GP-2000



・Tilt sensor jig (adjustable) / TO-7900



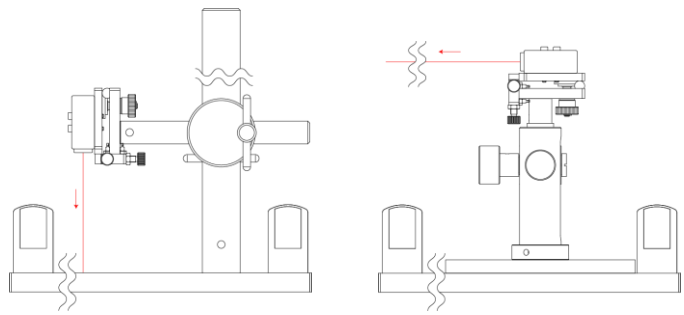
・Tilt sensor + Tilt sensor JIG



・Setting sample

(1) Beam Vertical　　(2) Beam Horizontal

*For details, please refer to the attached "Compact Tilt Mechanism Reference Material (0160-2).



*Drawings and specifications are subject to change without notice for improvement.

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