

TactoPoint 1×1 | Data Sheet

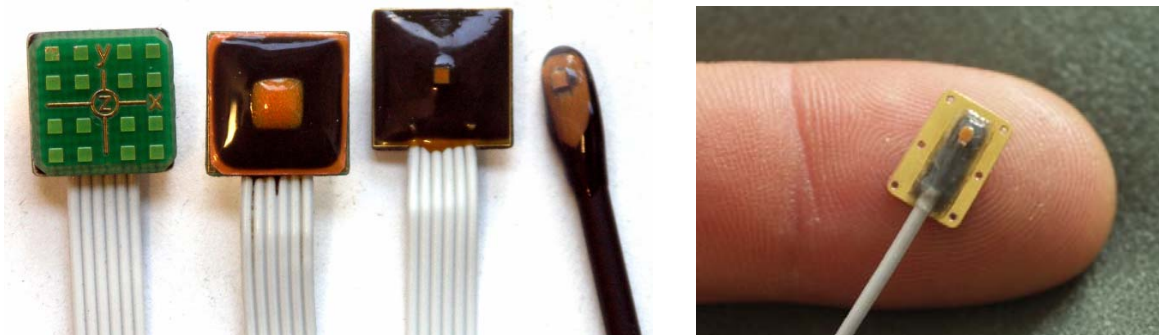
single element three-axial force sensor

Version 5.0.

General Description

TactoPoint 1×1 is the smallest and most sensitive contact-force measuring unit of Tactologic Ltd., consisting of a single three-axial taxel. The three-axial signal provides the possibility for basic dynamic, spatial-temporal tactile measurements, while the extremely tiny size (1×2 mm sensor chip size) makes this device perfect for sensitive tactile measurements at remote places where a finger can not reach.

TactoPoint is available in many different application-specific forms, e.g. on a catheter-like tip or on a small flexible or rigid support, etc.



Product Highlights

- extremely small size
- highly linear characteristics
- very high and custom sensitivity
- application-specific design
- easy connection to PC through read-out electronics
- easy-to-use software for acquiring, visualizing and storing data



Applications

- tele-surgery: multi-modal catheter or small tactile finger
- robotics: tactile feedback on small dexterous robot hands
- embedded: tactile interface for small electronic devices (mobile phones, game consoles, etc.)

Technical Specifications *

GENERAL	
technology	piezoresistive
measured quantity	three-axial force
number of taxels**	1 (1x1)
PCB type	rigid, flexible, or sandwich-type
DIMENSIONS	
bare taxel size	0.3x0.3 mm
size of total active area	0.8x0.8 mm – 3x3 mm (customizable)
size of device	min 5x8x3 mm (customizable)
SENSOR-ELEMENT CHARACTERISTICS	
bare sensor maximum load	3 mN
bare sensor sensitivity	4–6 mV/mN/V
maximum load with cover (range is customizable)	<i>normal</i> : from ± 0.25 N up to ± 5 N; <i>shear</i> : ± 0.1 N up to ± 2 N; (general load range is comparable to the one of light dexterous manipulation)
resolution	± 10 bit SNR
nonlinearity	$\pm 1\%$
accuracy	$\pm 5\%$
repeatability	$\pm 3\%$
long term instability under large load	approx. 1 bit lapse / min.
temperature dependence of offset	approx. 1 bit / °C
COVER	
cover type	elastic (Elastosil® RT-601) or rigid (PCB or Epotek® H70E)
Shore-A hardness of elastic cover	45
equivalent Young-modulus of elastic cover	2.4 MPa
elastic cover thickness	0.6 mm – 1.5 mm (customizable)
cover surface	hemispherical

* parameters are measured on 16 bit output through MasterBoard v5.0A
** tactile pixel or tactile element



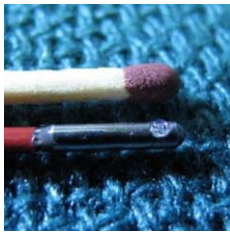
receptive field size of taxels with elastic cover	from 0.8×0.8 mm to 3x3 mm depending on custom design
viscoelasticity of the cover	<i>normal</i> : exp. decay in <2 min. <i>shear</i> : none
OUTPUT	
read-out electronics	Tactologic MasterBoard v5.0
output type	3-channel tactile data of one taxel
output resolution	8, 12 or 16 bit, depending on MasterBoard type
output noise	< 1 LSB
output scan rate	0–100 FPS
POWER	
voltage supply	USB powered through MasterBoard
current consumption	4 ± 2 mA sensor, 0-20 mA MUX
maximum power consumption	100 mW
SYSTEM LEVEL FEATURES	
connector type	USB, SPI, UART
read-out software	TactoSofT 2.2.
operating system	Windows XP, Vista
Minimal PC requirements	800 MHz processor, 40 MB hard disk space, 256 MB memory
OTHER	
warm-up time	2 minutes
operating temperature range	5 °C to 40 °C

Product Sub-types

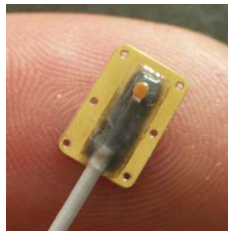
To fulfill all application specific demands, TactoPoint 1x1 sensor chips are available in many different designs. The general name abbreviation of the custom designs has the following notation:

(R_)WLH(f|r)(c|s)(e|r)

R_	reverse design (notation for inner use only)
W	width in mm
L	length in mm
H	height in mm
f or r	sensor is mounted on <i>flexible</i> or <i>rigid</i> PCB type
c or s	design is <i>catheter-</i> or <i>sandwich-like</i> (or none)
e or r	outermost cover material is <i>elastic</i> or <i>rigid</i>



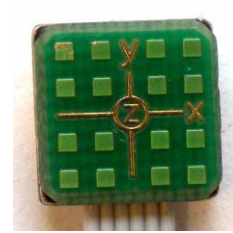
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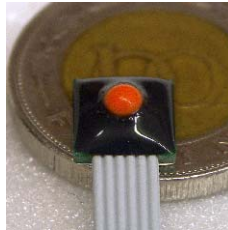
R_101003re



R_101003rs



040803fce



R_080804re



R_080805rr

No image

R_081203fe

Custom designs are also available. For further assistance, please contact us.

Revision History

Version	Date	Comments, changes
1.1	2008.04.18.	First commercial version
1.2	2009.02.23.	Small changes, some parameters enhanced
5.0	2009.09.15.	– Many new sensor designs with enhanced performance – Many parameters updated for use with MasterBoard v5.0

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It is our intention to provide our valued customers with the best documentation possible to ensure successful use of your **TactoLogic** tactile array. To this end, we will continue to improve our publications to better suit your needs. Our publications will be refined and enhanced as new volumes and updates are introduced.

If you have any questions or comments regarding this publication, please contact our company at info@tactologic.com. We welcome and appreciate your feedback!

TactoLogic engineers are constantly working to improve the quality of our products. Specifications are therefore subject to change without notice. To obtain the most up-to-date version of this data sheet, please visit our website at <http://www.tactologic.com>. You can determine the version of this document from the heading on the first page.

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