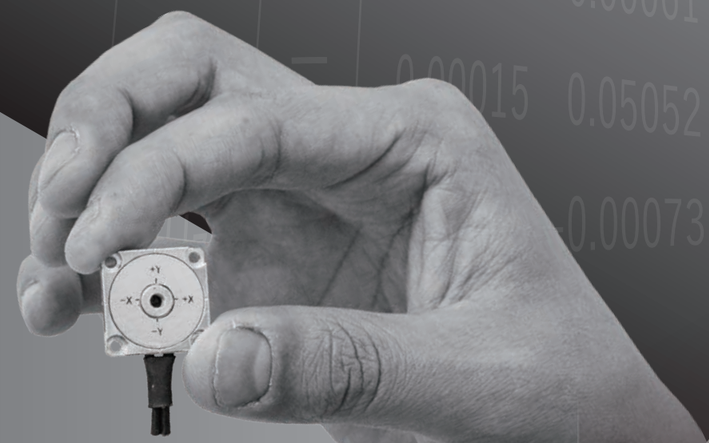
Open up measurement possibilities

MULTI AXIS FORCE SENSOR

Tec Gihan

FORCE PLATE TREDMILL HAPTICS

ABOUT US

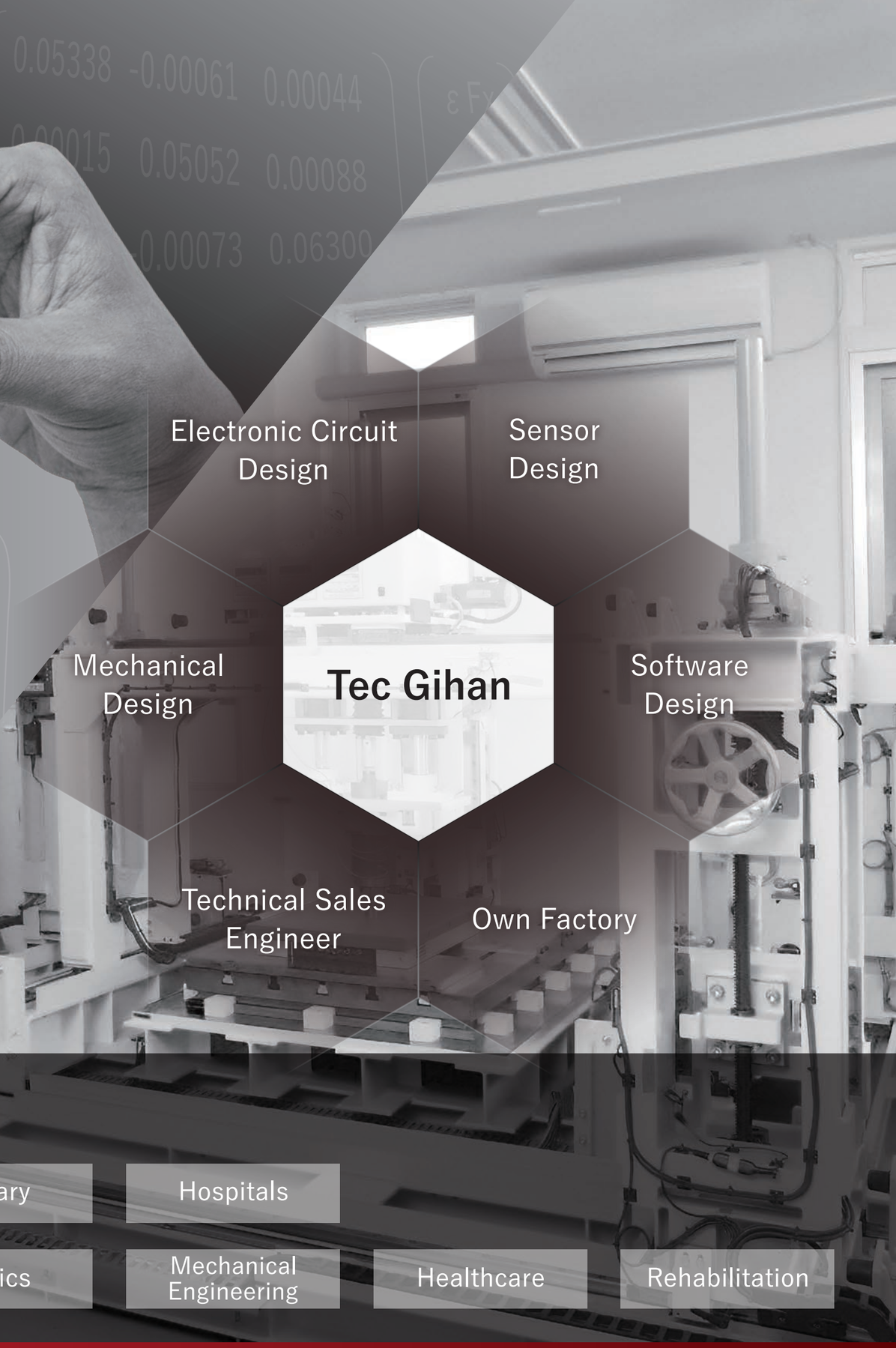


Measuring Invisible Forces

We are a Japan-based manufacturer of force sensors, and since our founding in 1991 we have placed measurement at the heart of our work. In addition to sensor development, we maintain amplifiers, data processing, and software in-house, cultivating strong core technologies. We continue to develop new technologies and take on what remains unknown in this world.

High-Precision Sensor Manufacturing

Designing compact multi-axis force sensors is one of our core competencies. We also excel at developing force plates that leverage multi-axis sensors. These products are not defined by design alone—precise calibration is critical. We develop proprietary calibration rigs to ensure accuracy and deliver high-precision sensors. We also specialize in custom designs and can meet a wide range of needs.



Main Fields

- Academia
- Industrial R&D
- Automotive
- Military
- Hospitals
- Biomechanics
- Robotics
- Ergonomics
- Haptics
- Mechanical Engineering
- Healthcare
- Rehabilitation

Multi Axis Force Sensors

3-Axis Force
Fx Fy Fz

USL06-H5

50/100/200/500 N

USL06-H5-AP

50/100/200/500 N

USL08-H6

1K/2K N

USLG25

10 N

USLG10

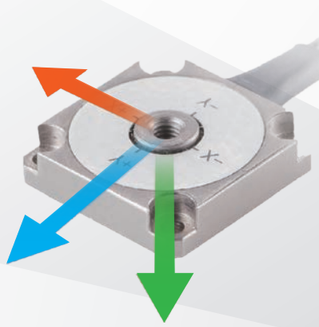
10 N

TL3B05

500 N

TL4B04

5000 N



A compact, low-profile multi-axis force sensor that integrates easily into a wide range of applications. We have extensive experience with bespoke designs and customizations and can tailor the sensor to your exact requirements.

6-Axis Force
Fx Fy Fz Mx My Mz

USX10-H10

500/1.5K N

TL6F04

2K/5K N

2-Axis Moment
Mx My

USL06-H5-MN

0.9/1.4 Nm

TL2F14

12 Nm

Torque
Mz

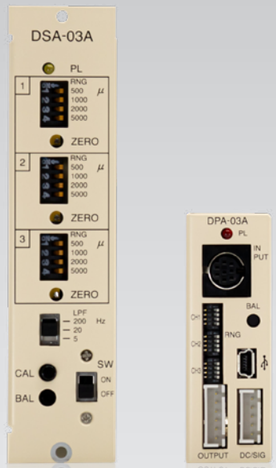
TTQ06

0.5/10/50/150 Nm

Name	Small 3-axis Force Sensor / 2-axis Moment Sensor						Small 3-axis Force Sensor		High-Sensitivity Small 3-axis Force Sensor		Small 3-axis Force Sensor		Small 6-axis Force Sensor		6-axis Force Sensor		2-axis Moment Sensor	Small Torque Sensor			
Model	USL06-H5-50N	**-100N	**-200N	**-500N	**-0.9NM	**-1.4NM	USL08-H6-1KN	**-2KN	USLG25-10N	USLG10-10N	TL3B05	TL3B04	USX10-H10-500N	**-1.5KN	TL6F04-2KN	**-5KN	TL2F14-12NM	TTQ06-0.5NM	**-10NM	**-50NM	**-150NM
Rated Capacity Fx, Fy	±25N	±50N	±100N	±250N	—	—	±500N	±1000N	±10N	±10N	±250N	±2500N	±250N	±750N	±2000N	±2500N	—	—	—	—	—
Fz	+50N	+100N	+200N	+500N	—	—	+1000N	+2000N	+10N	+10N	+500N	+5000N	+500N	+1500N	+2000N	±5000N	—	—	—	—	—
Mx, My	—	—	—	—	±0.9NM	±1.4NM	—	—	—	—	—	—	±4NM	±12NM	±70NM	±70NM	±12NM	—	—	—	—
Mz	—	—	—	—	—	—	—	—	—	—	—	—	±2NM	±6NM	±70NM	±70NM	—	±0.5NM	±10NM	±50NM	±150NM
Allowable Overload	200%				150%		120%		150%	200%	150%	150%	150%		150%	130%	150%	150%			
Nonlinearity	≦±1%R.O.						≦±1%R.O.		≦±1%R.O.	≦±1%R.O.	≦±1%R.O.	≦±1%R.O.	≦±1%R.O.		≦±1%R.O.		≦±0.5%R.O.	≦±0.5%R.O.			
Hysteresis	≦±1%R.O.						≦±1%R.O.		≦±1%R.O.	≦±1%R.O.	≦±1%R.O.	≦±1%R.O.	≦±1%R.O.		≦±1%R.O.		≦±0.5%R.O.	≦±0.5%R.O.			
Cross-talk	≦±1%R.O.						≦±1%R.O.		Fx,y : ≦±1%R.O. Fz : ≦±2%R.O.	≦±2%R.O.	≦±1%R.O.	≦±1%R.O.	≦±1%R.O.		≦±2%R.O.		≦±1%R.O.	—			
Dimensions (W×D×H)	20×20×5mm						28×28×6mm		Φ25×28mm	Φ14×27mm	Φ42×45mm	Φ48×40mm	30×30×10mm		Φ48×40mm		Φ40×40mm	Φ38×22mm	Φ38×30	Φ40×30	Φ49×35
Weight(excl.cables)	3g		7g	3g	9g		20g		22g	12g	60g	75g	15g	40g	75g		78g	49g	61g	130g	210g
Others	USL06-AP Model ・Power-supply voltage : 5V±5% DC ・Unloaded output : Approx. 2.5V (Initial adjustment by fixed resistance) ・Output : (Unloaded output) ±2V																				

Strain-Gauge Amplifier / AD Converter / Data Logger

We offer amplifiers tailored to your application.
Some models are optimized to perform built-in cross-axis (crosstalk) compensation for multi-axis sensors, so you can use your sensors right away. Custom designs are also available.



Strain-Gauge Amplifier

DSA-03

DMA-03

DPA-03

DPA-06

PDL-06-SA

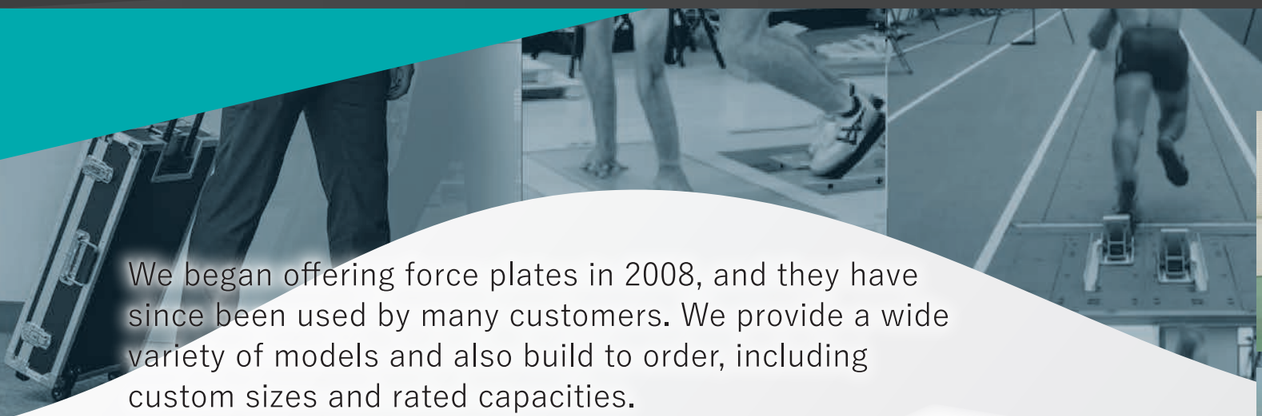
Name	3ch Signal Conditioner (Analog Amplifier)	Compact 3ch Digital Amplifier	Compact 3ch Operational Amplifier	Compact 6ch Operational Amplifier (Analog / Digital)	Portable 6ch Digital Amplifier (with Data Logger)
Model	DSA-03	DMA-03	DPA-03	DPA-06	PDL-06-SA
Number of Channels	3 ch	3 ch	3 ch	6 ch	6 ch
Applied voltage	DC 2.5 V	DC 2 V	DC 2 V	DC 2 V	DC 2 V
Sampling frequency	Analog output only	1 ~ 1000 Hz	Analog output only	1 ~ 10000 Hz	SD card recording : 500 or 1000 Hz PC recording : 10 ~ 100 Hz
Measurement range	±500 / ±1000 / ±2000 / ±5000 με	±5000 με	±250 / ±500 / ±1000 / ±2000 / ±5000 με	±7000 με (incl. zero adjustment range)	±5000 με (incl. zero adjustment range)
Resolution	Analog output only	16 bit	Analog output only	16 bit	16 bit
Analog output	±5 V	None	±5 V	±10V	None
Cross-talk Compensation	None	Available	Available	Available	Available
Dimensions（W×D×H）	30 × 128.5 × 191 mm	77 × 25× 71.5 mm	24 × 70 × 72 mm	120 × 105 × 30 mm	83.5 × 45 × 23.9 mm
Weight	620 g	190 g	165 g	340 g	64 g
Others	・TRIG : None	・TRIG : A point of contact ・Maximum 10 devices	・TRIG : None	・TRIG : A point of contact ・Maximum 20 devices	・TRIG : Infrared ・Battery Charging Time : 2hours Operating Time : 1.5hours

AD Converter

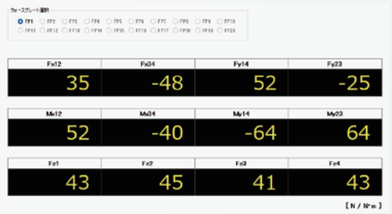
DSS300-HR

Name	12ch AD Converter
Model	DSS300-HR
Number of Channels	12 ch
Input voltage	± 10 V
Sampling frequency	1 ~ 20000 Hz
Resolution	16 bit
Cross-talk Compensation	Available
Dimensions（W×D×H）	228 × 110 × 55 mm
Weight	1000 g
Others	・Includes control software ・TRIG : A point of contact 、 TTL ・Maximum 8 devices

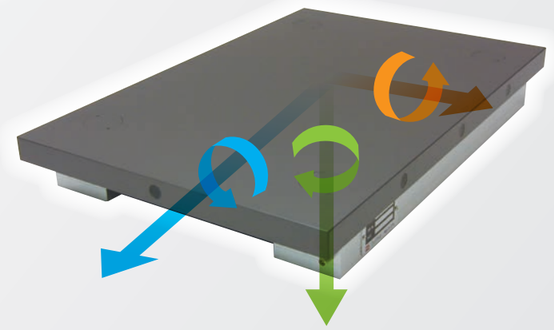
A Wide Range of Force Plate



We began offering force plates in 2008, and they have since been used by many customers. We provide a wide variety of models and also build to order, including custom sizes and rated capacities.



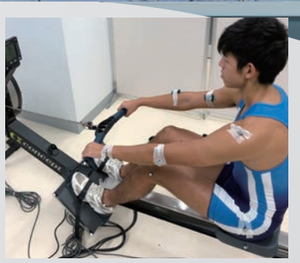
For installation, we monitor the load distribution on each sensor to ensure balanced loading and stable, reliable measurements.

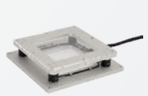










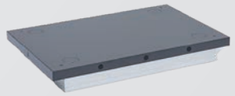


TF-2020
10 N
▶To P13

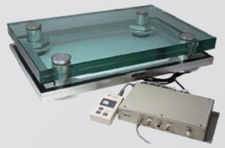

M3D
1000 N
▶To P16

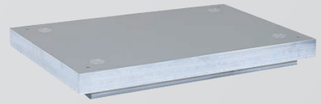

TF-3020
1000 N

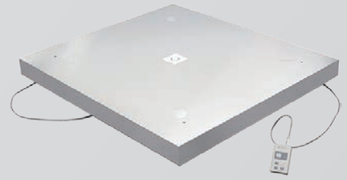

TF-3040
1000 N

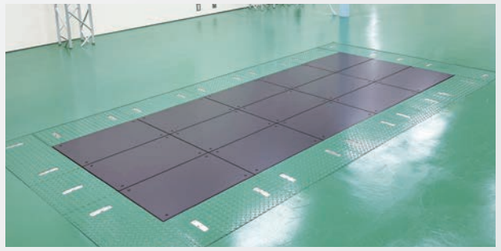

TFG-4060
3000 N

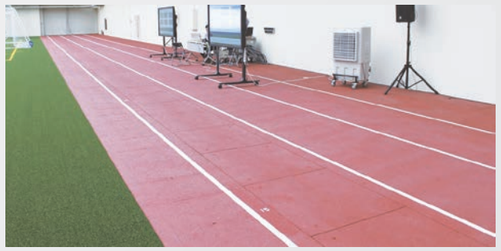

TF-4060
10000 N


TF-4060-G
10000 N


TF-6090
10000 N


TF-90100
10000 N





Name	Compact Force Plate	Compact Force Plate	Portable Force Plate	Standard Force Plate	Big Force Plate	Gaint Force Plate	Glass Force Plate
Model	TF-3020	TF-3040	TFG-4060	TF-4060	TF-6090	TF-90100	TF-4060-G
Rated Capacity Fx, Fy	± 300 N	± 300 N	± 1000 N	± 3000 N	± 3000 N	± 3000 N	± 3000 N
Fz	+ 1000 N	+ 1000 N	+ 3000 N	+ 10000 N	+ 10000 N	+ 10000 N	+ 10000 N
Mx	± 60 Nm	± 150 Nm	± 600 Nm	± 2000 Nm	± 3500 Nm	± 3500 Nm	± 2000 Nm
My	± 100 Nm	± 100 Nm	± 450 Nm	± 1500 Nm	± 2500 Nm	± 3000 Nm	± 1500 Nm
Mz	± 60 Nm	± 60 Nm	± 200 Nm	± 600 Nm	± 900 Nm	± 1000 Nm	± 600 Nm
Allowable Overload	150 %	150 %	150 %	150 %	150 %	150 %	120 %
Nonlinearity	≦ ± 1%R.O.	≦ ± 1%R.O.	≦ ± 1%R.O.	≦ ± 0.5%R.O.	≦ ± 0.5%R.O.	≦ ± 1%R.O.	≦ ± 1%R.O.
Hysteresis	≦ ± 1%R.O.	≦ ± 1%R.O.	≦ ± 1%R.O.	≦ ± 0.5%R.O.	≦ ± 0.5%R.O.	≦ ± 1%R.O.	≦ ± 1%R.O.
Cross-talk	≦ ± 2%R.C.	≦ ± 2%R.C.	≦ ± 2%R.C.	≦ ± 1%R.C.	≦ ± 1%R.C.	≦ ± 2%R.C.	≦ ± 2%R.C.
Natural Frequency	Z : 720 Hz	X , Y : 600 / Z : 320 Hz	X , Y : 550 / Z : 200 Hz	X , Y :360 / Z : 420 Hz	X , Y : 280 / Z : 350 Hz	X , Y : 220 / Z : 340 Hz	X , Y : 300 / Z : 370 Hz
Dimensions (W × D × H)	300 × 200 × 46 mm	300 × 400 × 44 mm	400 × 600 × 50 mm	400 × 600 × 77 mm	600 × 900 × 100 mm	900 × 1000 × 130 mm	400 × 600 × 97 mm
Weight	4 kg	7 kg	14 kg	31 kg	48 kg	68 kg	29 kg
Others	· Separate amplifier · Analog output available	· Integrated amplifier · Analog output available	· Integrated amplifier · Analog output available	· Integrated amplifier · Analog output available	· Integrated amplifier · Analog output available	· Integrated amplifier · Analog output available	· Separate amplifier · Analog output available

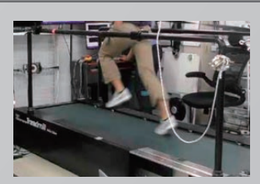
Force-Plate–Integrated Tredmill

High Performance Treadmill

The high-performance treadmill features a built-in force plate, enabling repeated measurement of ground reaction forces during walking and running. Thanks to advanced design and calibration technology, it provides high-precision data acquisition.

It is equipped with control software that enables independent belt control and programmable operation.By applying force feedback to the belt based on braking and propulsive forces, it reproduces natural walking, running, and uphill/downhill movement.

Single Belt Model

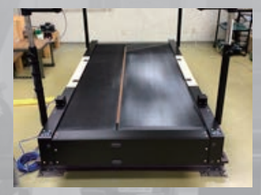


During running, there is no double-support phase—contact alternates between single-foot stance and a flight phase—so a single force plate is sufficient for measurement. You can focus on running without worrying about the belt seam. In load-control mode, deliberately applying a high load enables training that simulates uphill running or tire-drag pulls.

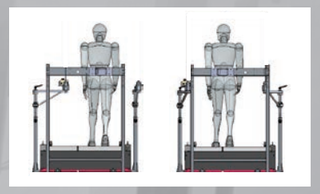
Dual Belt Model

During walking, there are moments when both feet contact the treadmill; however, because the dual-belt model places independent force plates (FPs) under the left and right belts, it can acquire six-component ground-reaction force and moment data (Fx, Fy, Fz, Mx, My, Mz) for each side. Since the left and right belt speeds can be controlled independently, the system is well suited for rehabilitation and for assistive suit (exoskeleton) development.

Hybrid Model



By simply adjusting the handrail position, this hybrid model supports both single-belt and dual-belt configurations.



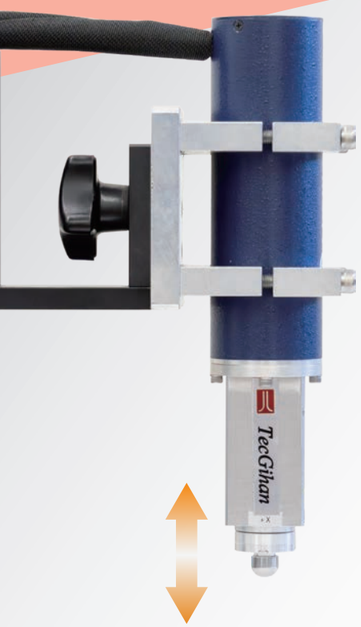
Type	Single Belt	Dual Belt	Hybrid Belt
Model	HPT-2200S	HPT-2200D	HPT-2200H
Dimensions(*)	820(W) × 2380(D) × 375(H)mm	1000(W) × 2380(D) × 375(H)mm	1120(W) × 2380(D) × 375(H)mm
Belt Size	1800mm × 600mm	1800mm × 400mm × 2 pieces	1800mm × 600mm
			1800mm × 400mm
Power Supply	Three-phase AC 200 V (1 sets)	Three-phase AC 200 V (2 sets)	Three-phase AC 200 V (2 sets)
Max Speed	30km/h	30km/h	30km/h

(* These are approximate dimensions and do not include any protruding parts.)

Force Plate			
Rated Capacity	Fx , Fy : ±3000 N / Fz : +6000 N	Fx , Fy : ±3000 N / Fz : +6000 N	600mm Belt Side : Same as HPT-2200S
	Mx : ±3000 Nm / My , Mz : ±1500 Nm	Mx : ±3000 Nm / My : ±1000 Nm /Mz : ±1500 Nm	400mm Belt Side : Same as HPT-2200D
Allowable Overload	150 %	150 %	150 %
Nonlinearity	≦±1%R.O.	≦±1%R.O.	≦±1%R.O.
Hysteresis	≦±1%R.O.	≦±1%R.O.	≦±1%R.O.
Cross-talk	≦±2%R.C.	≦±2%R.C.	≦±2%R.C.

Optional function Optional equipment	・Force Feedback Belt Control Mode ・External Voltage-Controlled Belt Drive Mode ・VR System	・External camera sync function ・Suspension Mechanism

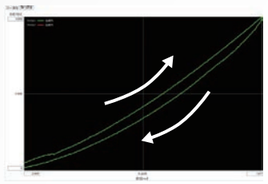
Unique Haptic Devices



YAWASA

Indentation Tester for Soft Materials

This is an indentation tester for soft (low-modulus) materials. Equipped with high-sensitivity force sensors (5 N or 50 N), it indents at a constant speed and, upon reaching the preset load setpoint, returns at a constant speed.

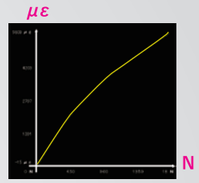


It measures the force–displacement (F–S) curve in both directions and calculates metrics such as Young's modulus, stiffness (slope), hysteresis, and energy (work).

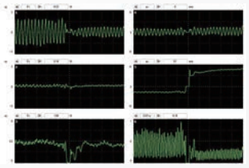
Haplog

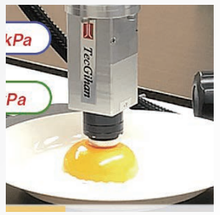
Haptic skill logger

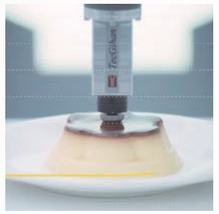
A finger-worn device that measures fingertip pressing (normal) force. Because the fingerprint remains exposed, you can measure without compromising the natural feel of the object. The sensor comes in five sizes, with measurement ranges up to 20–30 N (depending on size).



Your finger becomes the sensor.







Yubi-Reco

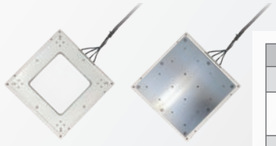
Finger Vibration Recorder

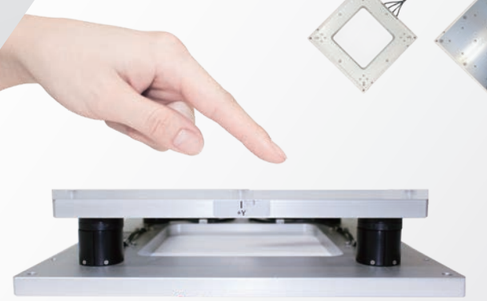
It enables quantitative evaluation of tactile feel and sharing of haptic sensations. By wrapping a PVDF (polyvinylidene fluoride) piezoelectric film around the finger, it captures vibrations introduced through the fingertip—turning your finger into a vibration sensor.

TF-2020

Haptic Force Plate

An ultra-sensitive force plate that captures even feather-touch loads while measuring all six components (Fx, Fy, Fz, Mx, My, Mz). It visualizes how forces are applied when handling delicate objects and enables textile evaluation from a haptics (tactile) perspective.





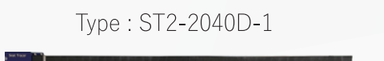
Name	Compact Force Plate
Model	TF-2020
Rated Capacity Fx, Fy, Fz	± 10 N
Mx, My, Mz	± 0.8 Nm
Allowable Overload	200 %
Nonlinearity	≦ ± 1 %R.O.
Hysteresis	≦ ± 1 %R.O.
Cross-talk	≦ ± 2 %R.C.
Natural Frequency	X : 190 / Y : 190 / Z : 270 Hz
Dimensions (W × D × H)	300 × 200 × 46 mm
Weight	4 kg
Others	・Separate amplifier ・Analog output available

Geometry Sensing System SEAT TRACER

SEAT TRACER

An innovative flexible sensor equipped with a 3-axis accelerometer and a 3-axis gyroscope that dynamically (i.e., non-static) measures the otherwise invisible three-dimensional geometry of a seat while a person is seated. It can be applied not only to automotive seats but also to mattresses with cushioning materials and office chairs.

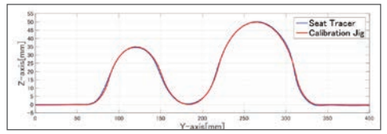
Type : ST2-2040C-1

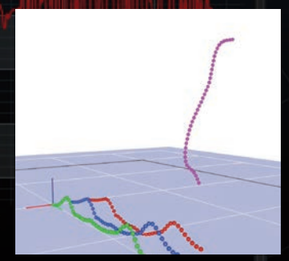


Type : ST2-2040D-1

Acuracy

Shipped only after verifying a root-mean-square error (RMSE) of ≤ 0.5 mm.

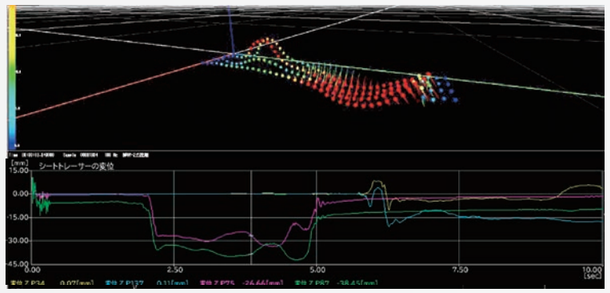




Software

Data Analytics

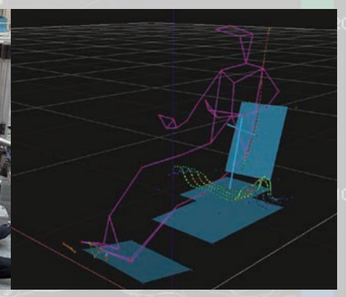
From the 3D data acquired with the Seat Tracer, you can compute and visualize displacement, point-to-point distances, angles, and other relative measurements.



Software

Integrataed Motion Capture

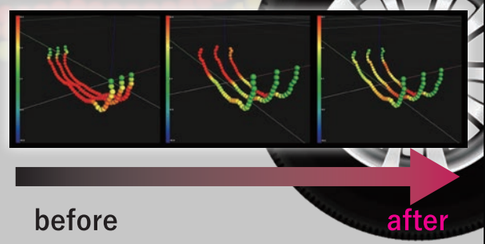
By measuring simultaneously with motion capture, the Seat Tracer data can be aligned to a common coordinate system—even if the sensors move—enabling integrated, unified data management.



Add-On

Dynamic Mode

We refined our acceleration-noise cancellation algorithm, enabling measurements even during real-vehicle driving.

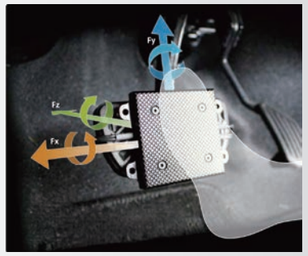


Special Force Plate

Mini Force Plate

M3D-EL-FP

Pedal Force Plate



A wearable, foot-mounted force plate that overturns the notion that force plates must be floor-installed.
Attached to the sole, it enables measurements without being limited by the measurement area and can also be mounted on pedals.
Available in wired, wireless, and analog-output models.

Name	Mini Force Plate	Mini Force Plate
Model	M3D-EL-FP-80 ・ M3D-EL-FP-95	Pedal Force Plate
Rated Capacity Fx, Fy	±500 N	±200 N
Fz	+1000 N	+100 N
Mx, My	±30 Nm	±0.4 Nm
Mz	±15 Nm	±0.2 Nm
Allowable Overload	150 %	150 %
Nonlinearity	≦±1%R.O.	≦±1%R.O.
Hysteresis	≦±1%R.O.	≦±1%R.O.
Dimensions (W×D×H)	□80type : 80 × 80 × 11 mm □95type : 95 × 95 × 11 mm	60 × 60 × 9.5 mm
Weight	□80type : 150 g □95type : 170g	170g
Others	・M3D-EL-FP-W : Wireless Model ・M3D-EL-FP-U : Wired Model ・M3D-EL-FP-A : Analog Output Model *Separate amplifiier	・Separate amplifiier

IMU Sensor

9-axis Motion Sensor IMSSD

A compact, high-precision IMU sensor.
It supports high-speed sampling and logging at 1000 Hz to the built-in SD card. It also features a standalone mode that starts recording with a single switch.

3-axis Accelerometer

3-axis Magnetometer

3-axis Gyroscope

SDcard 1000Hz logging !

Name	9-axis motion sensor
Model	IMSSD-H-A
Sensor Specifications	
Acceleration	±4G / ±8G / ±16G / ±30G ・ 16bit
Angular Velocity	±4000 deg/s ・ 16bit
Magnetic Field	±300μT ・ 12bit
Sampling Rates	SD Card Recording: up to 1000 Hz PC Recording (via Bluetooth): up to 100 Hz
TRIG	Infrared TRIG IN
Battery	
Charging Time	Approximately 2.5 hours
Continuous Operating Time	Approximately 2.5 hours
Dimensions (W×D×H)	54 × 42 × 14 mm
Weight	30 g
Others	・Connectivity : Up to 20 units can be connected

Systems for Automotive Development

Streering Sensor

While maintaining the wheel’ s natural shape, it enables detailed measurement of driver-applied forces. By integrating USL06 sensors into both the front and rear faces of the steering wheel, it measures not only torque but also grip force and opposing inputs—i.e., forces that cancel each other out in torque.

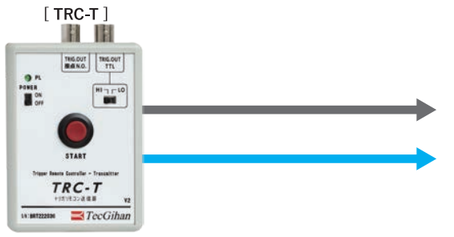
Boss 6-axis Force Sensor

Name	Streering Sensor
Sensor	USL06-H5-100N ×20unit *Available rated capacities: 50 / 200 / 500N
Dimensions	Handle diameter : approx. Φ380 mm Handle thickness : approx. Φ30 mm
Interface	USB connection (digital) BNC connector (analog output ±10 V) ZERO balance button REC start button
Optional Items	Boss 6-axis Force Sensor

Trigger Unit

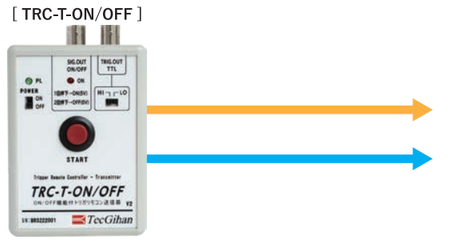
Wired TRIG Remote Controller

[TRC-T]



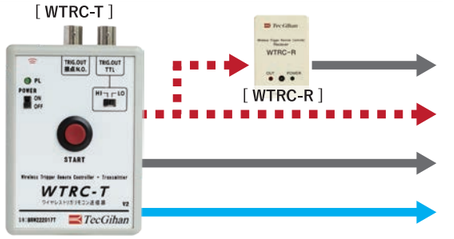
Wired ANALOG TRIG Remote Controller

[TRC-T-ON/OFF]



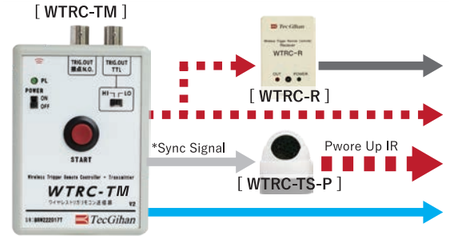
Wireless TRIG Remote Controller

[WTRC-T]



IR TRIG Remote Controller

[WTRC-TM]



Contact Closure

TTL(UP or DOWN)

IR Signal

5V or 0V

*Switches with each button press

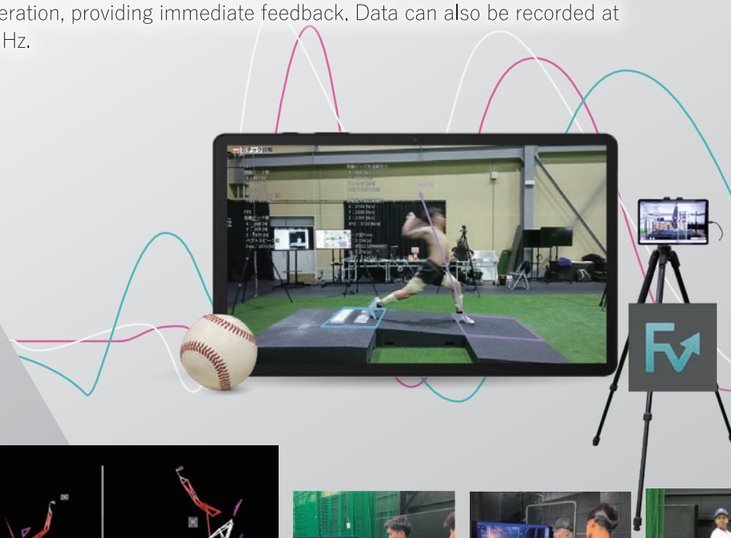
Baseball Analytics Solution

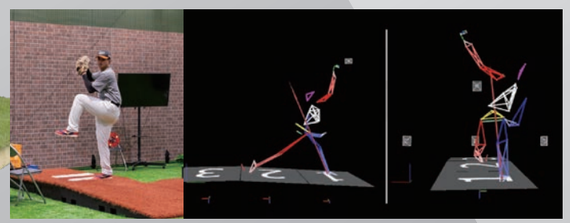
Pitching Mound Force Plate

Force plates can be embedded in the mound to measure the ground-reaction forces (GRFs) of the drive (pivot) foot and the lead (stride) foot during pitching. We also offer a dedicated portable mound, enabling measurements at training camps and other sites. Force plates can likewise be installed in the bullpen so pitchers can complete sessions on a dirt/clay mound.

Force Data Feedback App ForceVision

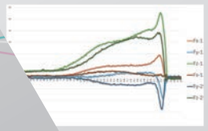
Simply connect the force plate to a tablet via USB to instantly overlay resultant force vectors on the video. It can report metrics such as peak force and acceleration, providing immediate feedback. Data can also be recorded at 1000 Hz.





Ball Sensor

By embedding the USL06 in the ball, the release-phase forces acting on the fingers during pitching can be measured in three components (Fx, Fy, Fz).

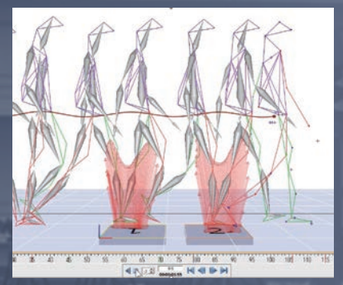


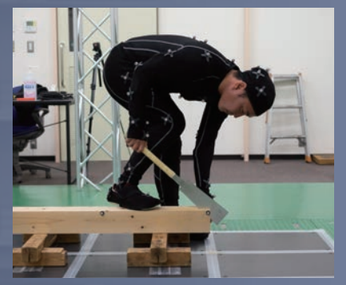
Name	baseball ball sensor
Sensor	USL06-H5-100N × 2 pieces
Rated Capcity	Fx,Fy : ±50 N / Fz : +100 N *Fz : Available rated capacities : 50 / 200 / 500 N
Sampling Rate	Max 1000Hz
Battery	Operating Time : 2.5 hours
Interface	Bluetooth

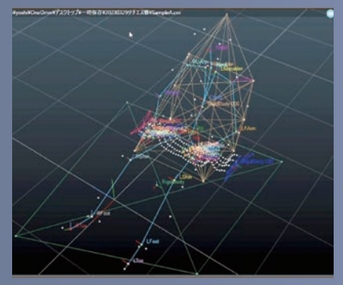
* NEXT BASE Inc.

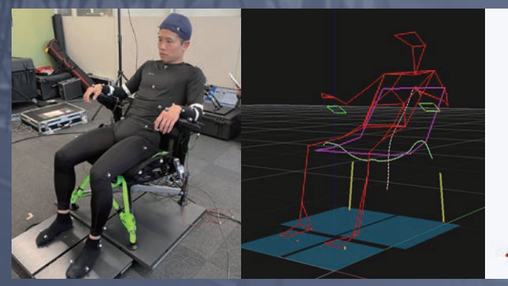
Integration with Motion Capture System

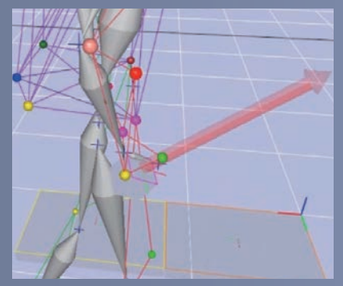
Tech Gihan's force plates have been integrated with a wide range of motion-capture systems.
In addition to multi-plate setups, we have experience with not only flat installations but also inclined configurations, and with different sizes and plate types. We also deliver integrated systems that combine force plates with our force sensors and the Seat Tracer.











ALL-E_0701R

Tec Gihan

Since 1991