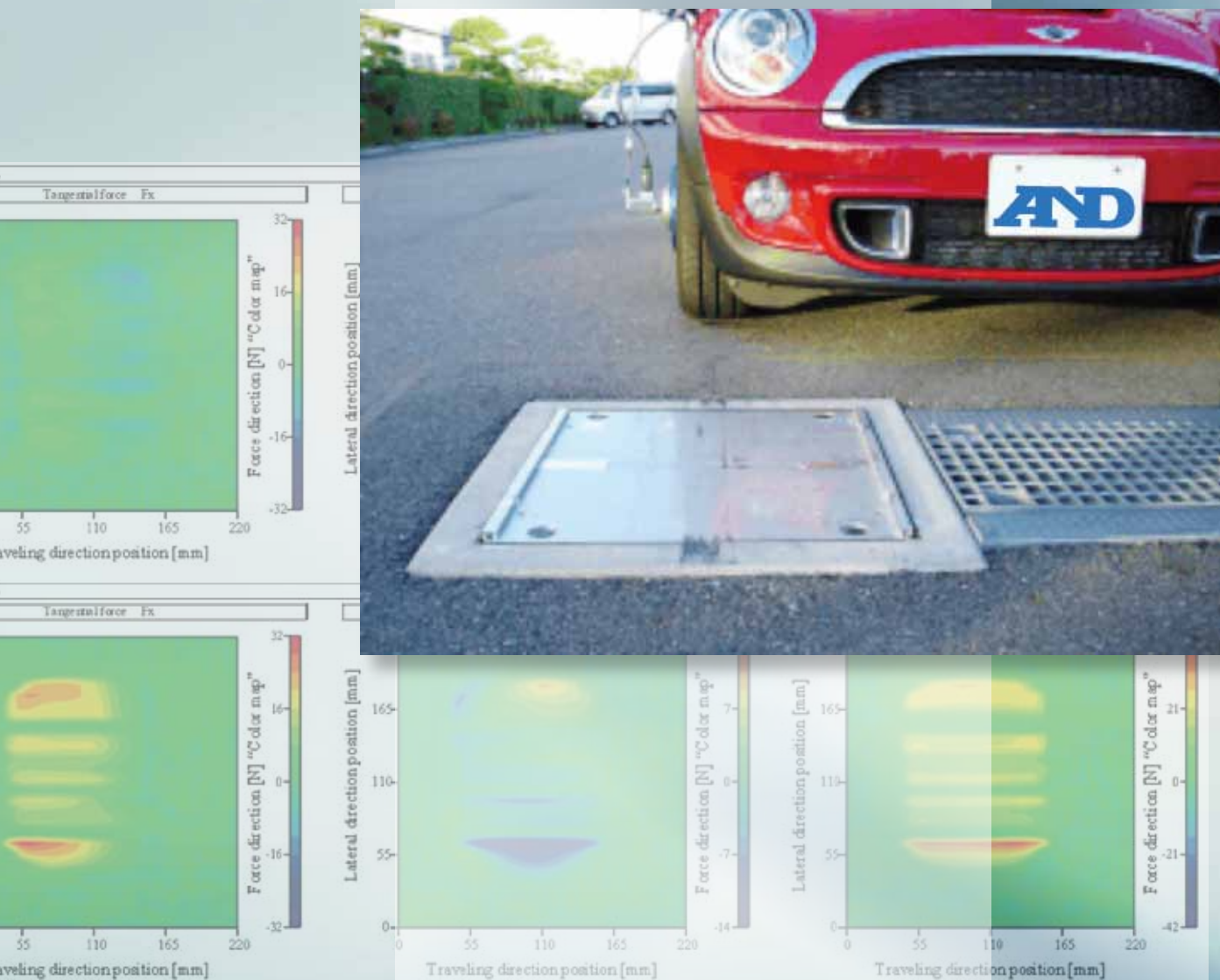


Force Matrix Sensor **FMS** AD7822 series

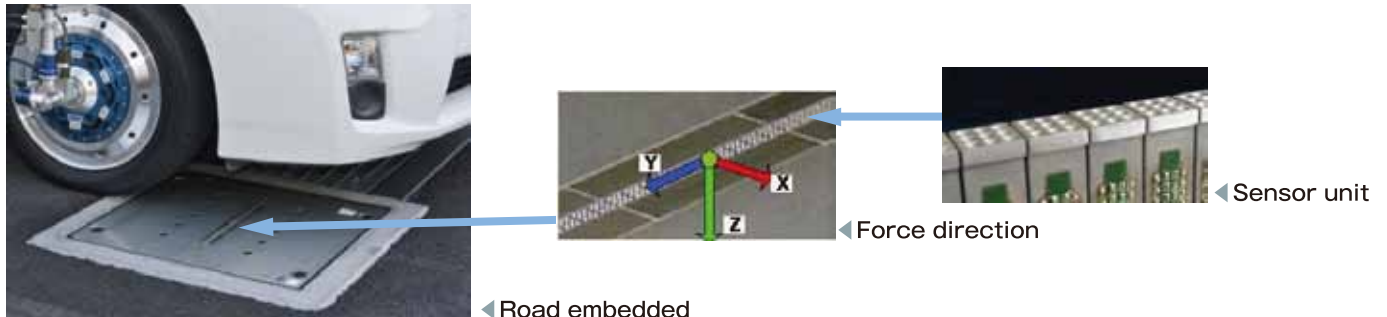
Features

- Tire footprint force distribution measurement [Fx, Fy, Fz]
- High accuracy measurement: $\pm 1\text{N}$ for all directions
- High resolution detection area (8mm \times 8mm resolution, 40 sensors/row)
- High speed simultaneous data acquisition (100 ksps)



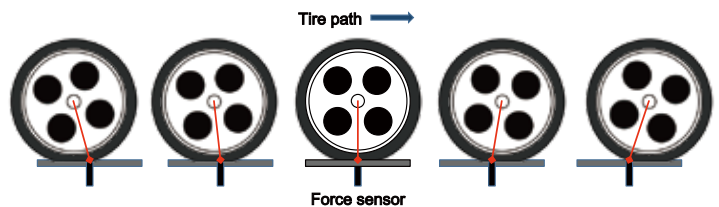
FMS provides detailed force data for tire footprint analysis.

- Tire footprint force distribution measurement system for 3 component force [F_x , F_y , F_z]
- High resolution detection area with 8mm×8mm sensor head and 40 sensors/row.
- High speed simultaneous measurement for all signals (3 force×40 sensors) with 100 ksp/s.
Fast enough to measure footprint forces with vehicle speed up to 400km/h
- High accuracy on force measurement ($\pm 1\text{N}$) for all 3 components of force.



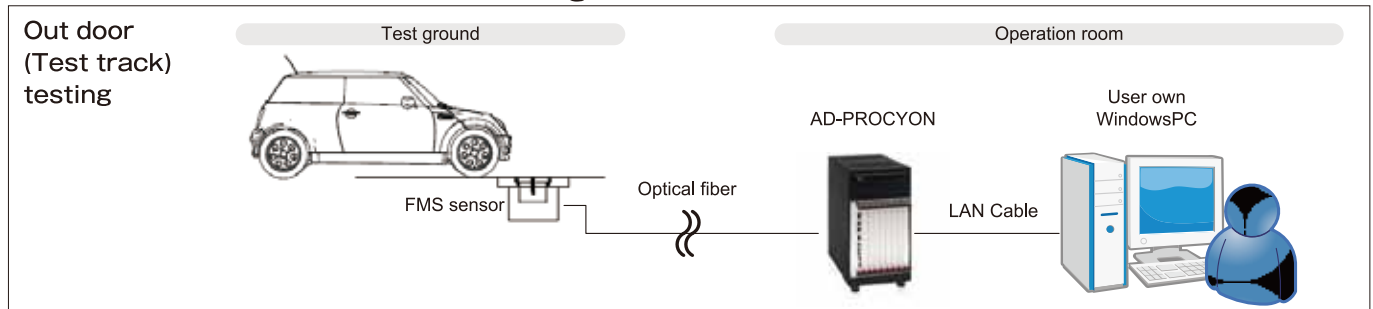
Tire footprint measurement

Sensor bits are placed as array (line) and measure 3 components of force when vehicle tire goes over the sensor array. Data is measured in time base.



System configuration

Outdoor installation for vehicle testing

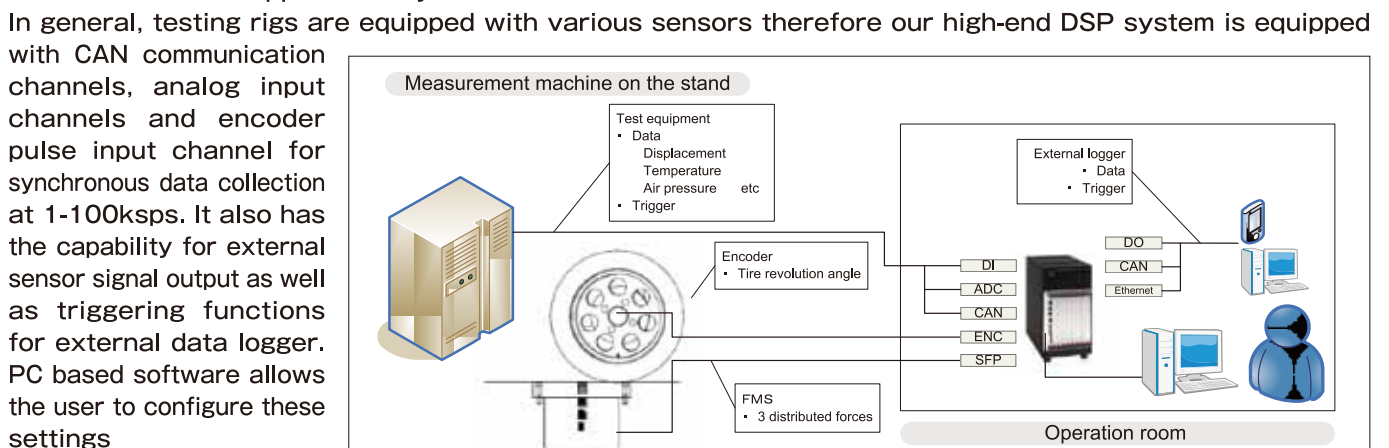


AD7822 consists of FMS sensor and AD-PROCYON DSP calculation unit.

- These two units are connected with optical fiber for high speed data transfer.
- Data is stored on the SSD memory installed inside the DSP and can be extracted via PC connection.
- PC application software is prepared for monitoring the measured data and parameter settings.

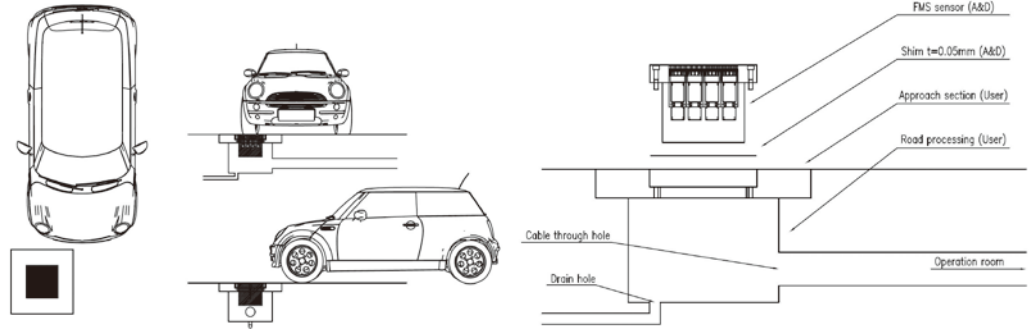
Indoor installation for tire testing

In the system below, the three components of tire footprint forces can be observed when the tire passes over the sensor at approximately 0.1 – 10km/h.



Installation and construction

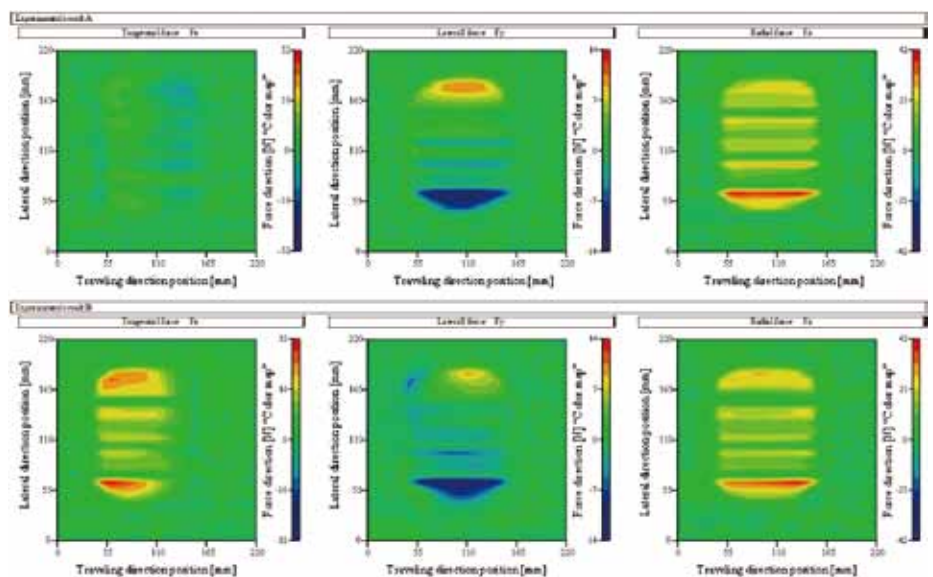
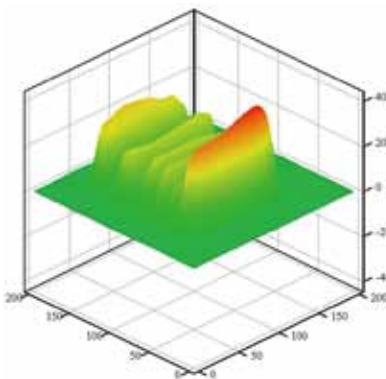
AD7822 is designed for installing it on a real road surface. In case of installation, construction at the road site by the user is required. Shown on the right is a figure for installing the sensor in the road surface. Sensor unit is indicated in grey.



Measured data

A sample of visual data of the 3 components of force (F_x , F_y , F_z) when a vehicle passes over the FMS from left to right

- Comparison of coast down speeds (20km/h top, 60km/h bottom)



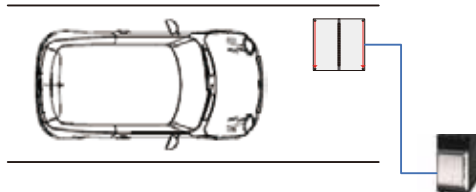
Product line up

The AD7822 series has a number of different line-ups corresponding to different uses, such as the number of wheel measurements or sensor lines. An example of a selection code is shown below.

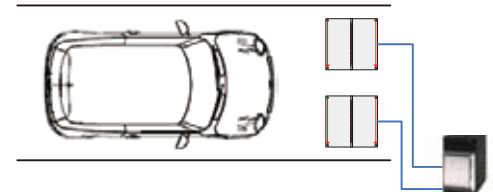
AD7822 A - 11 - 1L

Number of sensor lines (1L,2L,4L)
Number of wheel measurements (A ,B)

Number of Wheel measurements

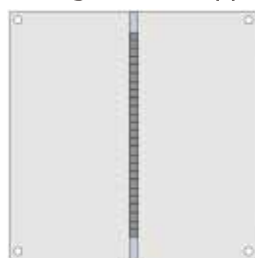


▲ Single wheel application (AD7822A)

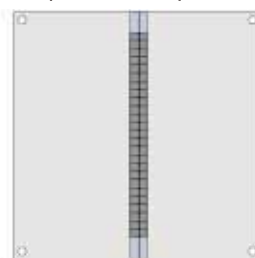


▲ Double wheels application (AD7822B)

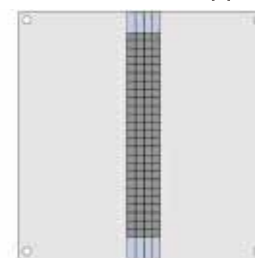
Sensor line application (A dummy sensor will be placed at the front and rear position of each sensor line to allow smooth entrance and exit.)



▲ 1 Line



▲ 2 Lines



▲ 4 Lines (limited to single wheel application)

■ Sensor specifications

Sensor part specifications

	Items	Specification
Size	Sensor head	7.5 mm × 7.5 mm
Measurement load	Longitudinal and lateral direction	50 N
	Vertical direction	100 N
Total accuracy (including linearity and hysteresis)		±1 N
Mechanical	Longitudinal / Lateral direction	7.6 kHz
Resonance	Vertical direction	95 kHz
Temperature effect	Zero	1%RO / 10degC
	Span	0.2% Load / 10 degC
Allowable load		300%
Temperature compensation range		-10 ~ 60 degC
Water proof		Drip-proof (can be used in rainy condition)
Data transfer		Max 100 ksps (kilo sample per sec)

■ DSP I/O specification

External I/O specifications

	Items	Specification
Ethernet	Number of channels	1
CAN	Number of channels	4
	Beau rate	125 k - 1 Mbps
Encoder pulse input	Number of channels	1
	Input format	Line driver differential input (A / B / Z phase)
	Maximim count number	-2, 147, 483, 648, ~ 2, 147, 483, 647
Analog input	Number of channels	2
	Input format	Single end
	Resolution	16 bit
	Input range	±10 V
Digital input	Number of channels	8
	Input format	Photo coupler input (supports current sink output)
	Operation input voltage level	DC 5 - 36V
Digital output	Number of channels	8
	Output format	Open collector output (Current sink type)
	Output level	DC 5 - 36V
External power supply voltege output	Number of power line	1
	Voltage	12 V
	Maximum curent	0.5 A

Power supply specifications

Items	Specification
Votage	DC 24 V
Maximum power consumption	Less than 75 W per lin (40 sensors)

Sensor Plate specifications

	Items	Specification
Size	Sensor plate	498(W) × 498(D) × 80(H) mm
	Underground part	380(W) × 380(D) × 270(H) mm

General specification

Items	Specification
Body scale	140(W) × 270(D) × 140(H) mm
Temperature range	0 - 40 °C
Humidity range	5 - 90 %RH
Storage temperature	-20 - 70 °C
Power supply	AC 90 - 264 V
Frequency	47 - 63 Hz
Maximum power output	120 W



Safety Warning!

●For proper use, read the instruction manuals carefully before use.

AND

...Clearly a Better Value

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●Appearances and/or specifications subject to improvement without notice.
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