Devices thru Material Innovation

NEC/TOKIN

Vol. 01

# 3D Motion Sensor MDP-A3U9 Developers Kit MDP-A3U9DK

## Outline

This 3D 1motion sensor unit (MDP-A3U9) with a ceramic gyro, acceleration sensor and terrestrial magnetism sensor, detects the 3-dimensional posture angle of the device on which it is installed. Compared to the conventional MDP-A3U7, it is an upper version realizing full range measurement and higher precision with increased number of installed sensors.

## Kit composition

- MDP-A3U9 motion sensor unit
- Evaluation board
- USB cable (1.8m)
- Support disk (CD-ROM)

## Features

- Compact size and light weight
- High response speed
- Possibility of installation in desired direction
- Possibility of full range measurement (yaw angle: ±180°, pitch angle: ±180°, and roll angle: ±180°)
- No need of adjustment (readjustment necessary depending on the environment for use)

## Applications

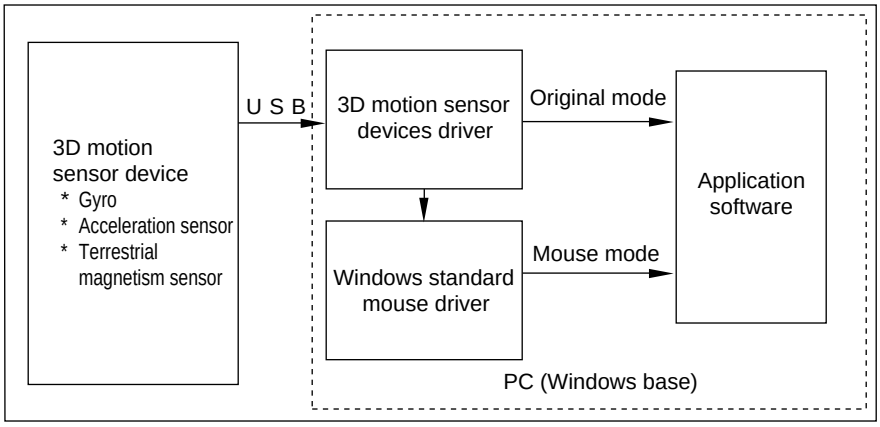
- Tracker for head mount display
- Motion capture
- Detection of mobile unit posture angle

## Specifications

| Items | | Specifications |
|---|---|---|
| Output Form | | Z-Y-X Euler's Angle |
| Dynamic Range | $\alpha$ (Yaw angle, Z-axis) | ±180deg |
| | $\beta$ (Pitch angle, Y-axis) | ±90deg |
| | $\gamma$ (Roll angle, X-axis) | ±180deg |
| Resolution | $\alpha$ (Yaw angle, Z-axis) | 1deg |
| | $\beta$ (Pitch angle, Y-axis) | 1deg |
| | $\gamma$ (Roll angle, X-axis) | 1deg |
| Maximun Error | $\alpha$ (Yaw angle, Z-axis) | ±10deg |
| | $\beta$ (Pitch angle, Y-axis) | ±10deg |
| | $\gamma$ (Roll angle, X-axis) | ±10deg |
| Data update speed | | 125Hz |
| Interface | USB | Comforms with USB spec.1.1 |
| Power supply voltage | | DC5V (to be supplied via USB interface) |
| Current consumption | | 100mA or less |
| External Dimensions | Width×Depth×Height | 31.6×43×22mm (Typ) |
| Weight | | 22g (Typ) |
| Operating Temperature | | 0～40°C |
| Applicable machine | | IBM PC/AT 100% compatible machine with USB interface |
| Applicable OS | | Microsoft Windows 98SE, Me, 2000, XP |

Note: Windows is a trademark of U.S. Microsoft Corporation registered in the U.S.A. and other countries.

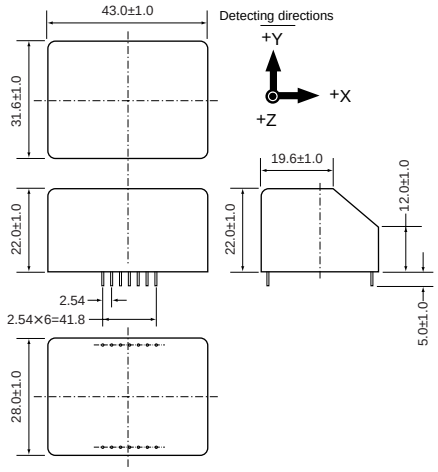
**Functional Block Diagram**




Original mode : Performs posture angle calculation according to the data from the 3D motion sensor and transfers the result to the application software.

Mouse mode : Performs posture angle calculation according to the date from the 3D motion sensor, emulates the mouse operation based on the result, and transfers it to the application software.

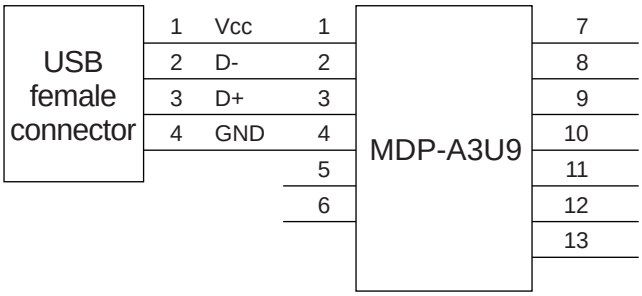
## ■Shapes and Dimensions




[mm]

| Pin No. | Function | Remarks |
|---|---|---|
| 1 | Vcc | USB communication terminals |
| 2 | D- | |
| 3 | D+ | |
| 4 | GND | |
| 5 | NC* | * Analog output from the built-in sensor is possible as an optional feature. |
| 6 | NC* | |
| 7 | NC* | |
| 8 | NC* | |
| 9 | NC* | |
| 10 | NC* | |
| 11 | NC* | |
| 12 | NC* | |
| 13 | NC | |

## ■Evaluation board connection circuit diagram




**■Caution for use of evaluation board**

- **When soldering the 3D motion sensor onto the evaluation board, carefully prevent your hand from coming into contact with a hot part such as the heated portion of the soldering iron or the terminal being soldered.**
- **During soldering, keep the soldering part away from combustibles such as paper and inflammable fluids such as alcohol.**
- **When installing the 3D motion sensor body onto the evaluation board, install it correctly by checking its direction.**
- **End soldering in as short a time as possible. Excessive terminal heating may cause a defect or malfunction.**

# 3D Motion Sensor MDP-A3U9
# Developers Kit MDP-A3U9DK

## NEC TOKIN Corporation

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