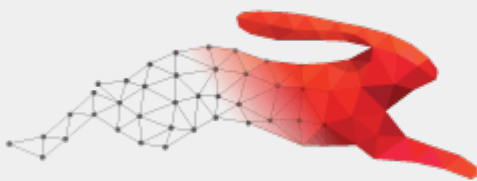
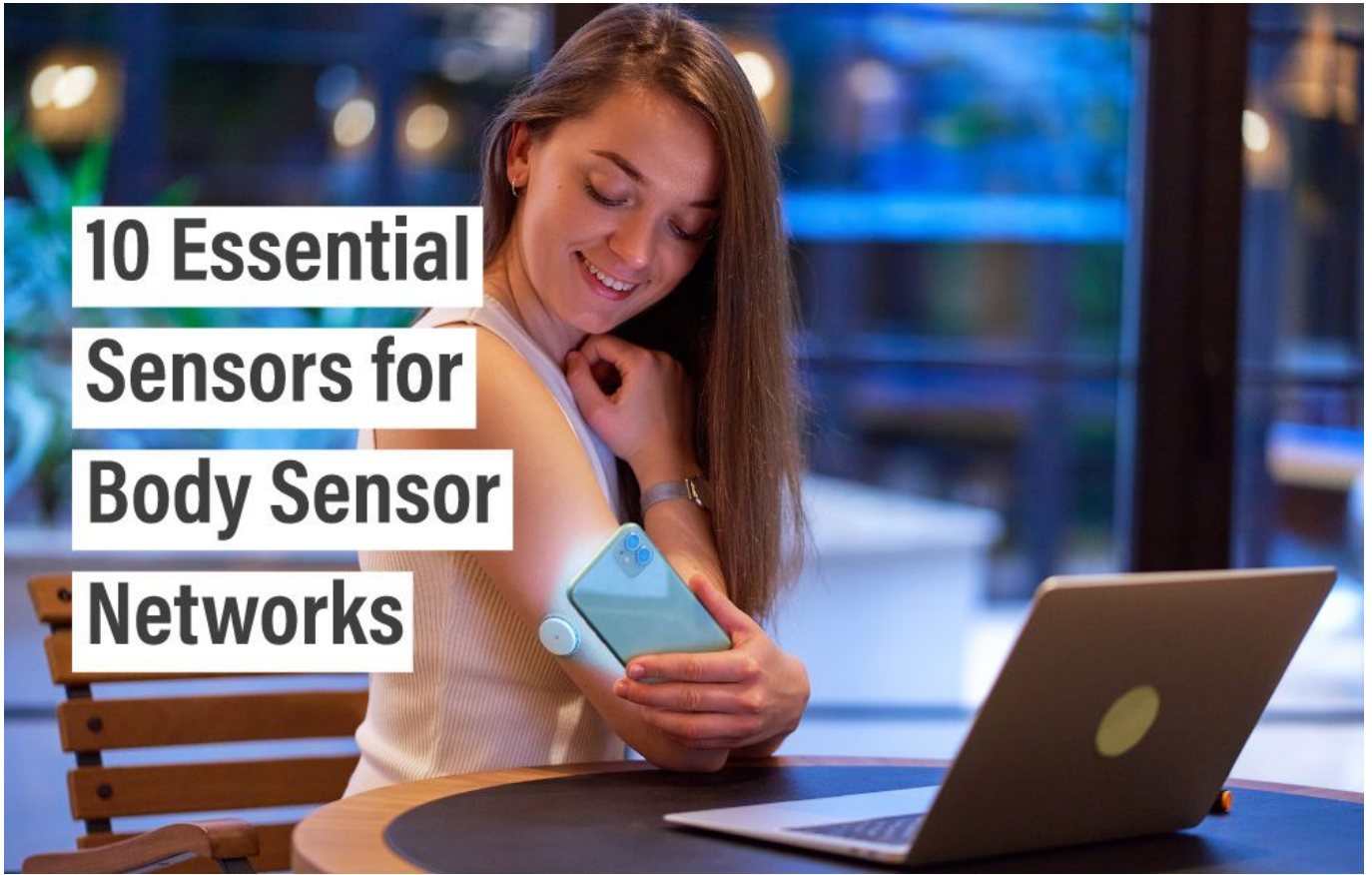


# 10 Essential Sensors for Body Sensor Networks



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# 10 Essential Sensors for Body Sensor Networks

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## Key Points

- Body sensor networks integrate the technology of sensing, intelligent information processing, pervasive computing, and communication
- Body sensor devices process information and provide a near-accurate view of the physiological, behavioural, health, or emotional state of the person wearing it
- Body sensors as measurement devices. For example, heart rate, oxygen saturation, motion, blood pressure, arterial pressure, electrical or sweat gland activity
- Wearable sensors as monitoring and detection devices. For example, temperature, respiration, or glucose levels
- Body sensors using haptic technologies. For example, assistive devices for people who are deaf or blind
- All of these devices provide invaluable insights into how our bodies work so we can better understand and manage current/future health problems or medical conditions.

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## Ben Mazur

Managing Director

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Body sensor networks are the wave of the future in medical monitoring and diagnostics. By using wearable sensors to collect data from various body parts, these networks enable medical professionals to better understand how the body functions and what is happening inside it. In this post, we discuss 10 essential sensors for body sensor networks.

[Body sensor network](#) (BSN) is a branch of wireless sensor network (WSN) that:

- Integrates the technology of sensing, intelligent information processing, pervasive computing, and communication
- Gathers statistical and electronic data from physiological and surrounding environments
- Records physiological data and transmits it to a controller unit
- Processes information to provide a near-accurate view of a person's physiological, behavioural, health, or emotional state

Wearable medical devices (e.g. respiration, heart, and blood pressure monitors) are rapidly [improving healthcare and the way it's administered](#): they allow medical practitioners, caregivers, and users to be more proactive and therefore play a vital role in the prevention, diagnostics, treatment, and monitoring of illnesses and medical conditions.

# How are wearable body sensors most commonly used?

## 1. Heart Rate/Pulse Sensor

A heart rate/pulse sensor is a device that measures the electrical activity of the heart and provides insight into heart rate and other cardiac functions. It can monitor patients with cardiovascular conditions or detect signs of distress during physical activities such as exercise or sports.

## 2. SpO2 Sensor

A device used to measure oxygen saturation levels in the blood by detecting changes in light absorption caused by haemoglobin molecules carrying oxygen through the body. This type of sensor is often used in sleep studies and for long-term monitoring of patients with chronic respiratory diseases or other conditions that affect oxygen levels in the blood.

## 3. Inertial Measurement Unit (IMU) Sensor

Measures linear and angular motion, acceleration, and rotational rates in three dimensions (X, Y, Z). This type of sensor can detect changes in posture or gait, as well as sudden movements or falls. It can also track movements during physical activities such as running, swimming, and biking.

## 4. Pulse Wave Velocity (PWV) Sensor

Measures blood pressure indirectly by measuring the speed at which pressure waves travel through arteries. This type of sensor is often used to monitor patients with hypertension or other cardiovascular conditions because it indicates arterial stiffness, which can help diagnose certain diseases such as atherosclerosis or diabetes mellitus.

## 5. Temperature Sensor

Detects changes in temperature. It allows for long-term monitoring of thermal fluctuations within an environment or on a surface, such as skin temperature during feverish illnesses like colds or flu viruses or during hot weather events like heat exhaustion or sunburns from overexposure to UV rays.

## 6 . Respiration Rate Sensor

Monitors breathing patterns over time by measuring changes in air pressure caused by inhalation and exhalation. This type of device detects abnormalities in breathing patterns which may indicate respiratory issues such as asthma, chronic obstructive pulmonary disease (COPD), and sleep apnea.

## 7 . Blood Pressure (BP) Sensor

Measures arterial tension using oscillometric technology, which detects pressure waves generated by each heartbeat. BP sensors are often worn around the upper arm, continuously monitoring BP levels over time and providing valuable insights into overall cardiovascular health.

## 8 . Glucose Level (GL) Sensor

Monitors glucose levels over time without requiring invasive or painful procedures such as finger-pricking devices to draw blood samples. The most common type uses a combination of infrared light and near-infrared spectroscopy techniques to estimate GL concentrations in capillary blood samples taken from fingertip pores, earlobes, etc.

## 9 . Electrocardiogram (ECG) Sensor

Measures electrical activity along different points on the torso via electrodes attached directly onto skin surfaces. These devices detect abnormalities related to heart muscle function, which may

indicate underlying issues such as arrhythmia (irregular heartbeats), ectopic beats, and conduction delays.

### **10 . GSR/EDA Sensor**

GSR stands for galvanic skin response, while EDA stands for electrodermal activity. Both refer to sensors explicitly designed to measure sweat gland activity via skin conductance measurements when an individual experiences emotional arousal due to excitement, fear, anger, and stress.

## **Final thoughts on body sensor networks**

Our top picks are the 10 essential body sensors discussed here, but many more are available depending on your specific needs. For example, [sensors using haptic feedback technologies](#) are being used for robot-assisted minimally invasive surgery (RMIS), medical training, and assistive devices for people who are deaf or blind.

These devices provide invaluable insights into how our bodies work so we can better understand and manage current and future health problems or medical conditions. In addition, wearable body sensors designed for personal/individual use and [digital diagnostics have moved the point of care](#) to wherever the user is. This has made healthcare more responsive (crucial information is sent/received in real-time so action can be taken quicker) and also more accessible for people living in rural or remote areas.

With a seemingly endless range of applications that body sensor networks can be used for, we're excited to see what the future holds! Are there any trends you're watching or applications that deserve mention on our list? Please comment and let us know, or join our mailing list for more industry insights and expert tips to help you develop and launch new products like a pro.

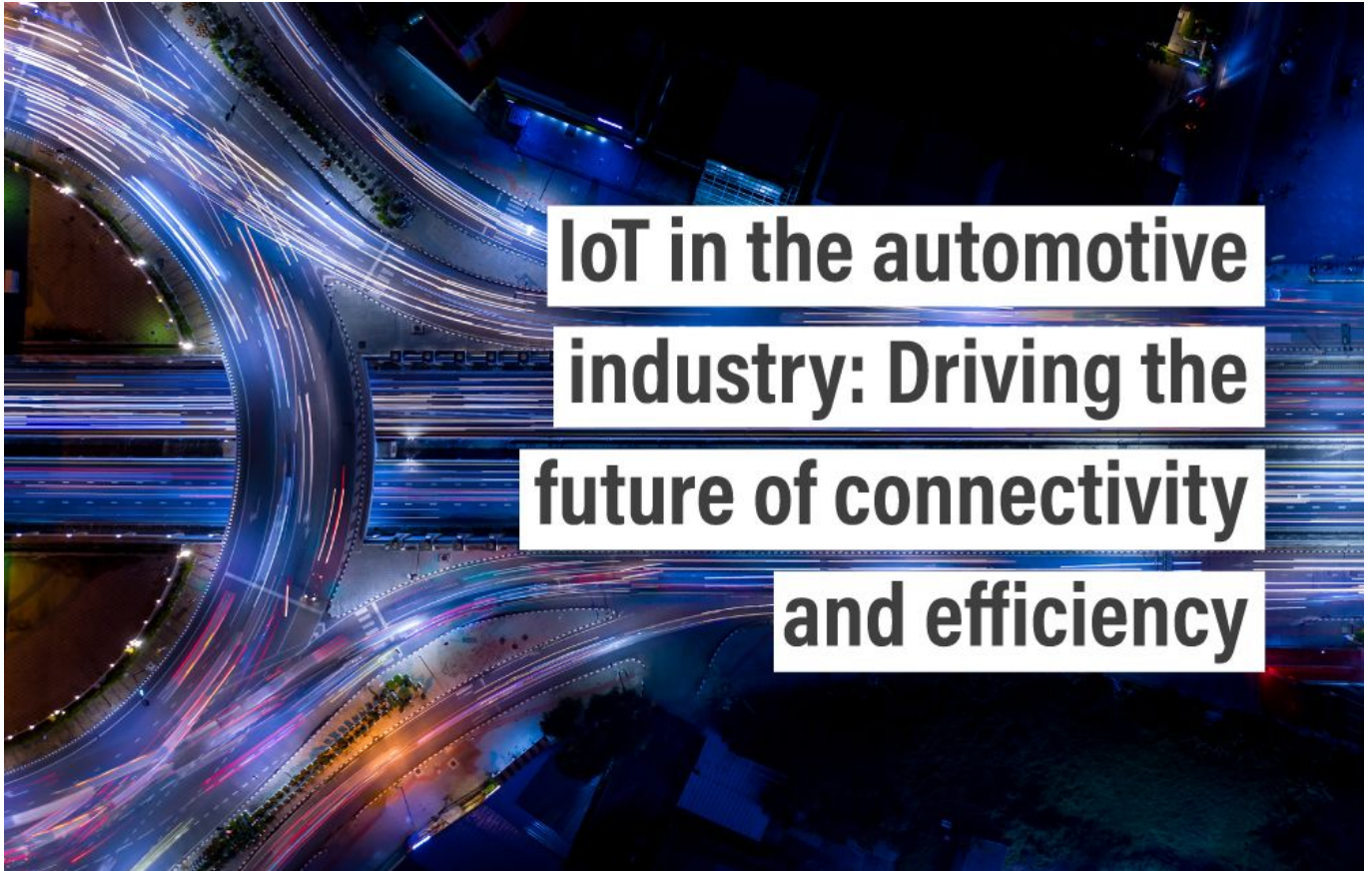
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