SMART HOME

SMART HOME

more comfort, more security, more energy-efficiency

Your coffee machine starts brewing your first cup of the day as soon as your alarm goes off in the bedroom. The heating switches off when you open a window. Did you remember to close all doors and windows when you left the house? It takes just one look at your smartphone for reassurance and peace of mind – or even the option to remotely close the window which you had left open. Cleaning robots relieve us from having to do time-consuming and tedious chores around the house and outdoor cameras alert us of any suspicious activities. In other words: The Smart Home promises comfort and security as well as climate protection.

This is no longer just a vision of the future: Already many people use at least one smart home application. These include smart household appliances, language assistants, building/home security, home entertainment, energy management or comfort and lighting.

SMART HOME

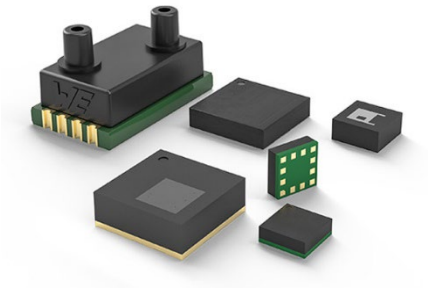
Benefits of a Smart Home

1) More living comfort: From lawn mowing and vacuuming down to making coffee – in a smart home many tasks can simply be delegated. Lighting, smart TVs or music systems can easily be controlled using an app or voice command. Controlling devices using voice commands also increases the quality of life for elderly people or people with impaired mobility. It can even be lifesaving: in an emergency, you can get help by simply calling out for help or using the sensor alarms when there is no telephone within reach. A very important point in these times of demographic change.

2) Saving energy: Using smart controls, energy consumption can be reduced significantly. Smart thermostats regulate room temperature automatically when nobody is at home. Additionally, lighting can also be adjusted more precisely. So, you do not only save costs, but also help to protect the environment.

3) More security: Up to a certain point, the Smart Home can protect against intruders. Alarms and surveillance cameras can be activated using motion sensors with event triggers. Intrusions can be recorded on a smartphone. However, to deter intruders in the first place, blinds can randomly be opened and closed or loud music can be played inside the house, even when nobody is at home.

SMART HOME



The correct sensors for the correct data

Smart Homes work through electrical device communication. Sensors record data that is transmitted to connected devices, which triggers the intended sequences.

Sensors play a particularly important role. They must cover a broad range of different applications. Würth Elektronik has several sensors in its portfolio which are suitable for use in a Smart Home. Using acceleration sensors (WSEN-ITDS, 2533020201601), a Smart Home is able to recognize whether a person has fallen inside the house and trigger an appropriate responses. These sensors also detect whether a window is open or tilted. Using temperature sensors (WSEN-TIDS) and humidity sensors (WSEN-HIDS) for controlling indoor conditions naturally springs to mind. Together with an active ventilation system, the formation of mildew can be prevented. Absolute pressure sensors (WSEN-PADS, 2511020213301) are also suitable for the use in a Smart Home, for example as part of an intruder alarm system. If for example a window is broken or a door is opened, the sensor detects the change in air pressure. For such applications these sensors are often an easier and more cost-effective solution as compared to existing systems.

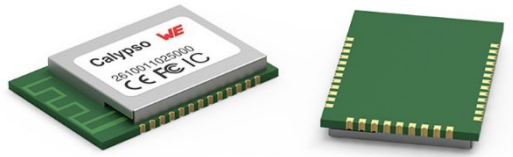
In new buildings many of these technologies are installed during construction. However, if you already own a property and also want to benefit, you can easily retrofit and keep installation costs low for the sensors. The solution involves installing sensors without batteries or cables that rely on energy harvesting technologies to generate the energy required for measurements and data transmission. Naturally, Würth Elektronik's sensors are very energy efficient, and, as an added bonus, the energy management can be modified.

SMART HOME

Communication through WiFi

With the WiFi radio module Calypso, Würth Elektronik offers a suitable radio solution. It is WiFi-certified, thus ensuring interoperability. Excellent security functions such as Secure Boot and SSL/TLS-V encryption protect the module and its application from remote attacks. The AT command interface can be easily configured and comes with an evaluation kit for quick prototype installation and testing. The most important benefit is the flexible firmware choice, where instead of standard firmware, customized firmware can be added during production of the module. The result is a unique out-of-the-box radio solution.

Another benefit to note: Calypso is not only suitable for use in the Smart Home, but also ideal for industrial applications



Further infomation in our Wireless Connectivity & Sensors Product Guide.

SMART HOME

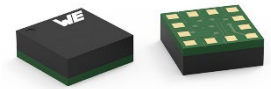
Würth Elektronik Components

Calypso

Wi-Fi Radio Module (AMB5201)

Characteristics

- Fully featured standalone Wi-Fi module
- IEEE 802.11 b/g/n, 2.4 GHz
- Small form factor: 19 x 27,5 x 4 mm
- Industrial temperature range: -40 °C up to +85 °C
- Low power operation to support battery operated applications
- Sleep mode <10 µA, Power save mode < 2mA (Active network connection)
- Output power +18 dBm peak (1DSSS)
- Sensitivity -92 dBm (1DSSS, 8% PER)
- Smart antenna configuration (2-in-1 Module)
- Protocols implemented: TCP/IP(IPv4/IPv6), MQTT, SNTP, mDNS, DHCP
- UART-to-Wi-Fi brigde (Transparent mode)
- RESTful API support
- WPA3 Wi-Fi security support
- Remote GPIO configuration and control



WSEN-ITDS

3 Axis Acceleration Sensor

Characteristics

- MEMS based capacitive sensing principle
- Fully calibrated 14 bit output
- Full scale ±2 g, ±4 g, ±8 g, ±16 g
- Bandwidth up to 1600 Hz
- 32 level FIFO buffer
- Embedded temperature sensor
- I²C and SPI digital communication interface
- Application specific functionality: Free-fall, wake-up, tap, activity, motion and orientation detection
- Temperature range: -40 °C up to +85 °C

Applications

- Industrial IoT and connected devices
- Impact recognition and logging
- Vibration monitoring
- Predictive maintenance / Activity tracking

WSEN-PADS

Absolute Pressure Sensor

Characteristics

- MEMS based piezo-resistive sensing principle
- Fully calibrated 24 bit pressure output
- Selectable output data rate up to 200 Hz
- 128 level FIFO buffer
- Embedded temperature sensor
- I²C and SPI digital communication interface
- Application specific interrupt event setting
- Temperature range: -40 °C up to +85 °C

Applications

- Altimeters and barometers / Weather stations
- GPS navigation enhancement / Indoor navigation
- White goods
- Wearable devices