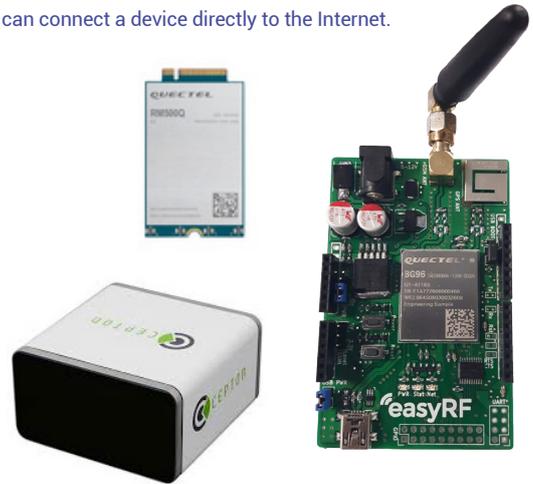


# Wireless and IoT

The Internet of Things (IoT) is a broad term which encompasses the multitude of wirelessly connected devices that surround us. It applies not only to smartphones and tablets, but to millions of machines, devices connected to the internet in a smarter, safer and more efficient way, in markets and applications like traffic light control, waste management systems or remote sensors.

Most of the time UWB, Bluetooth or WiFi will be used for short distances. For long-range applications cellular wireless technologies are used, like LTE, 5G, NB-IoT, which can connect a device directly to the Internet.

- LTE / 5G
- GSM / GPRS
- GPS / GNSS receivers
- RTLS systems
- WiFi
- Bluetooth
- UWB
- LoRa
- Zigbee
- SoC
- LPWAN
- RF transceivers
- ISM band modules
- RF-ID products
- Antennas
- RF cable assemblies
- RF connectors
- Interface converters
- USB products
- I/O to TCP/IP



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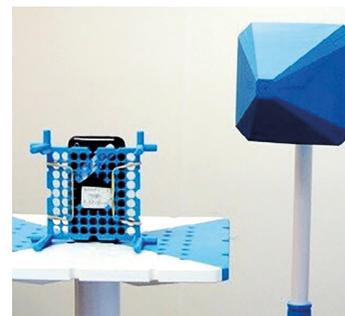
## Test and Measurement



Especially for the implementation of the antenna, the category Test and Measurement includes Vector Network Analyzers and Antenna Radiation Measurement tools. These tools with antenna measurement techniques ensure that the antenna meets the specifications by measuring the typical parameters such as gain, bandwidth, radiation pattern, beamwidth, polarization and impedance.

A powerful toolset that provides everything needed to implement and verify wireless communication and IoT devices. For measuring antennas, attenuators, amplifiers etc, tuning and optimizing RF designs. A great advantage is that the RMS has a frequency range from up to 6 GHz and can be used without an anechoic chamber.

- VNA ~ RF Vector Network Analyser (400 MHz ~ 6 GHz)
- RMS ~ Antenna Radiation Pattern Measurement System (370 MHz ~ 6 GHz)

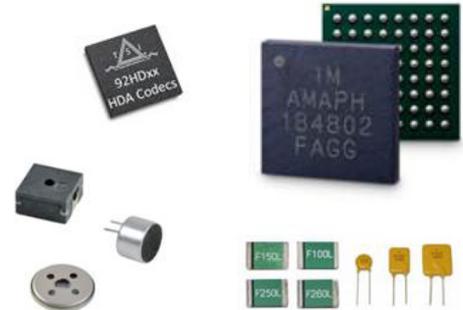


# Components

A wide range of components for markets like industrial, consumer and medical including the best brands for microcontrollers, audio products and crystal oscillators. TOP-electronics can offer products for all applications, especially when lower power, high accuracy and easy implementation is required.

Voice control systems are growing in popularity, like controlling an elevator by voice, white goods and other home automation systems. This requires the need for far-field voice control modules, microphones and speakers, and an applications microcontroller.

- Microcontrollers
- Real Time Clocks
- MOSFETs
- Crystal oscillators
- Resettable fuses
- Bluetooth chips
- Audio codecs
- Voice control modules
- Buzzers
- Speakers
- Microphones
- Enclosures



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# Connectors and Cables

The category Connectors and Cables includes all kind of connectors and cables used in a variety of demanding environments, including industrial control systems, telecommunications, test- and measurement systems and medical applications.

In the category Connectors you can find audio jacks, board to board, DC jacks, HDMI, memory sockets and mini PCI sockets. And also RF, Pogo, RJ11, RJ45, Sim card sockets and USB connectors.

In de category Cables you can find cables for data (USB, ethernet), power cables and of of course RF cables. Depending on quantity tailor-made precision connection and cable solutions can be created.

- Cables
- Cables assemblies
- Connectors
- Terminal blocks
- Mini PCI sockets
- Card holders
- Sim card sockets



# Motion Control

In applications such as production lines and laboratory equipment where power, efficiency, and accuracy of movement are of vital importance, the products of the motion control category are required. The products deal with moving individual parts of the machine or device in a controlled manner.

The category Motion Control includes all products directly related to motor control: such as chips and modules to drive motors, stepper-, BLDC motors and servo systems. To have a good control loop the use of encoders will be very helpful.

- Motor drivers
- Motion controllers
- Motors
- Servo systems
- Encoders



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# Power Conversion

The task of all power conversion products in the Power Conversion category is to process and control the flow of electrical energy by supplying voltages and currents in a form that is optimally suited for user loads.

This category offers a wide variety of cutting-edge converters for DC DC power and AC DC power for industrial, medical, transportation and consumer applications. The form factors are open-frame, enclosed, power adapters and DIN-rail with power outputs up to 3000W.

- AC DC External
- AC DC Internal
- DC DC Converters
- DIN Rail Power Supplies
- Power Filters



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# Precision Analog

In this category you can find industry-leading power analog innovation for applications requiring high precision control of current, voltage and speed in the industrial, defense and aerospace, medical and semiconductor capital equipment markets. The product families include power operational amplifiers, PWM amplifiers and precision voltage references.

Product form factors include monolithic ICs, board-level "open frame" modules, and hybrid designs that can deliver up to 50A of continuous output current and voltage supply operation ranging from 5V to 2500V, can achieve slew-rates of 3000V/ $\mu$ .

- Power Operational Amplifiers
- PWM Amplifiers
- Voltage References

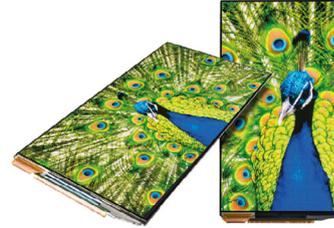


# Displays and Embedded Computing

A wide range of technology for all kinds of markets and applications can be found in this category. The portfolio goes from small TFT, OLED or E-Ink displays for battery-powered applications to huge information panels to show a lot of content. A capacitive touch-screen helps to control the application better. In combination with a SOM with a high-end ARM processor or other MCUs a whole system can be created.

The embedded systems are designed to perform a dedicated function, either as an independent system or as part of a large system. By offering a wide range of LCD displays, industrial displays, touch technologies, and embedded computing products, TOP-electronics has the ability to offer customers significant performance advantages in the market, together with significant cost and lead-time reduction.

- Monochrome modules
- TFT modules
- Resistive and capacitive touch
- PMOLED and AMOLED
- E-Ink



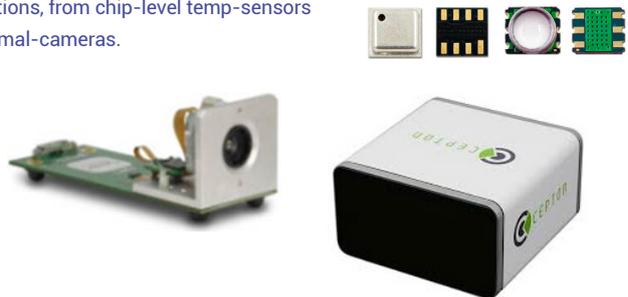
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## Sensors

Sensors are used in everyday objects such as a vacuum robot in your house, climate controlled offices and autonomous cars. For applications where temperature, motion, gas, humidity need to be measured.

TOP-electronics offers a broad range of solutions, from chip-level temp-sensors to high-end Lidar systems and compact thermal-cameras.

- Lidar
- Thermal cameras
- Motion sensors
- Encoders
- Temperature sensors
- Humidity sensors
- CO2 sensors
- Pressure sensors



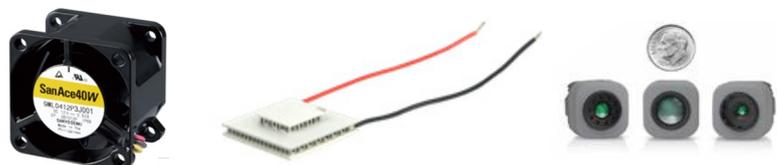
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## Thermal Management

All electronic devices and circuitry generate excess heat and thus require thermal management to improve reliability and prevent premature failure. The category Thermal Management includes products directly related to the several techniques for cooling, including various styles of heatsinks, thermoelectric coolers, forced air systems and fans, and others.

A range of OEM Thermal Camera Cores for integration into your system are also part of our product portfolio when temperature needs to be visual in for example Test & Measurement, Security Surveillance, Public Safety, Outdoor Recreation and IoT applications.

- Thermal cameras
- Cooling fans
- Peltier elements
- Heatsinks



## TOP-electronics is...

- a specialized distributor and representative
- technology provider for more than 15 years
- focused on customer requirements
- partner of hightech world-leading manufacturers
- providing professional technical and logistic support
- globally present with offices around the world



## Global local partner

With offices in the Netherlands, France, Germany and Hong Kong to support the EMEA market and the USA for North and South America, TOP-electronics is able to provide global technical and logistics support in local markets.

By support we mean a high level of technical support in product selection and design, as well as logistic support during production.

The TOP-team loves to connect technology and engineers, working together as partners and finding the best solutions. Starting at the development and transforming the idea into a prototype with the goal of bringing the design into production.

With a diversity in product groups, technically driven experts and manufacturers who provide the latest electronic solutions, the TOP-team can help creating your innovation.

*So let us know when you have an idea. We are happy to support!*