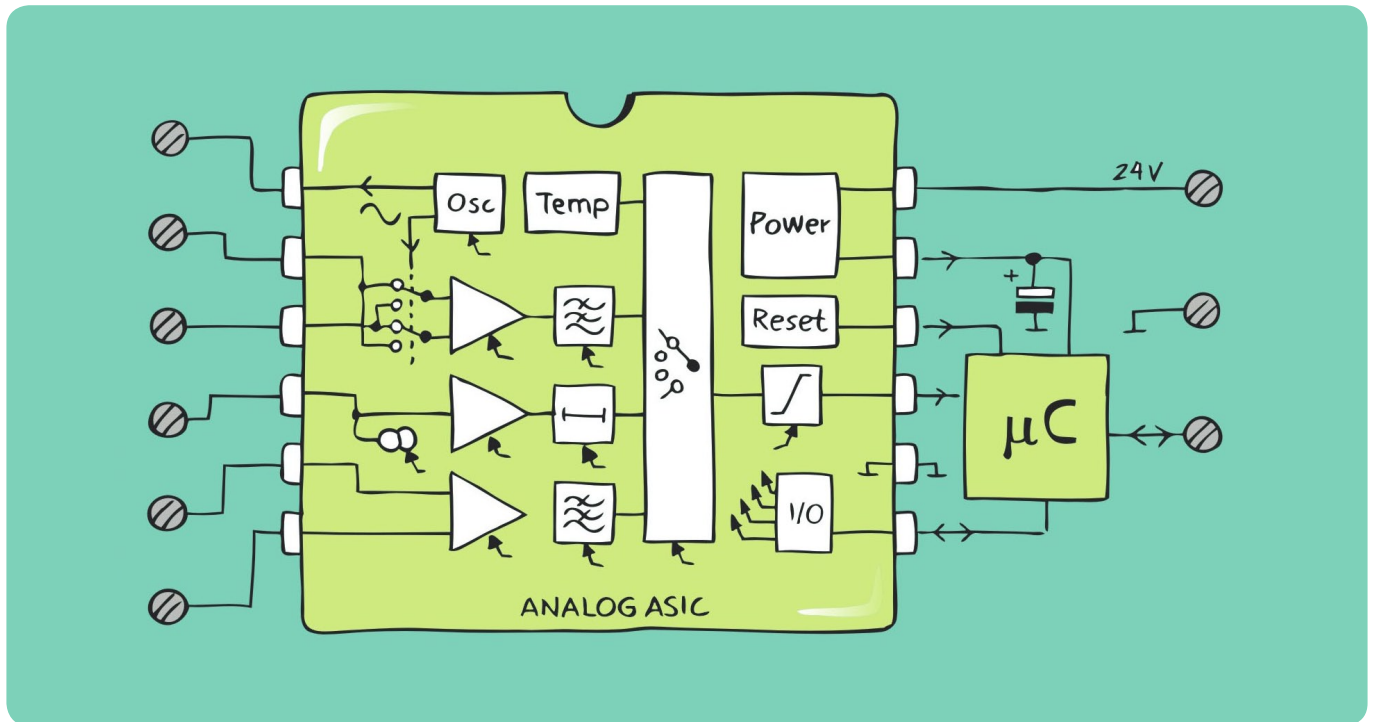




# Minimum Microcontroller System



**A good way to create a well optimized microcontroller system is to integrate support and signal conditioning functions in one analog component.**

**This approach combines the flexibility of a microcontroller solution with the high level of integration in an ASIC.**

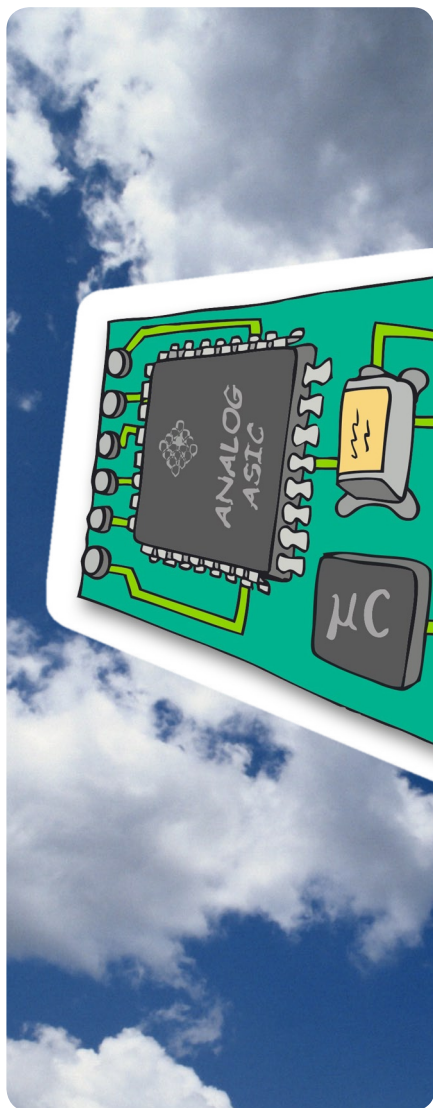
Many industrial electronic systems rely on the performance of a microcontroller. The interaction with the world outside the system does however call for additional analog functions.

A well optimized solution is when an analog ASIC realized as a Specific Component from SGA performs signal conditioning and provides support functionality to the microcontroller. The standard microcontroller gives flexibility for future upgrades of the system. The Specific Component minimizes cost and size of the system.

### Proper Partitioning

A microcontroller is a very well integrated component. Many brands and versions are available and there is a constantly ongoing evolution towards more computational power and versatility for each Euro spent. Upgrading of a system is often performed by the introduction of a new microprocessor generation.

Other functions around the microcontroller will call for several additional components of different complexity. This includes support functions but also the application



dependant analog signal processing to make input and output signals fit the microcontroller.

These functions are perfect examples of what can be integrated in a Specific Component.

A system partitioning with a standard microcontroller and a Specific Component that interfaces to the surroundings enables a very compact solution.

#### Signal conditioning functions

It is likely that wisely performed analog signal conditioning of input signals will lower the performance demands on the microcontroller.

The signal range of an analog input signal can for example be adapted to fit well to the input range of an A/D converter within the microcontroller. A properly conditioned signal may well reduce the need for A/D converter performance from 12 to 10 bit resolution.

Another example is when working with modulated sensor signals. Analog demodulation outside of the microcontroller will greatly reduce the need for computational power within the microcontroller.

#### Support functions

All microcontrollers will need support functions to work in their applications. Such functions are also very good examples of what can be integrated in a Specific Component. Some examples are:

- Generation of microcontroller supply voltage from raw power
- Power on reset based on actual measurement of the system supply
- Output drivers for communication or other functions

#### The SGA solution

Both application specific analog signal processing and microcontroller support functions can be integrated in one analog ASIC.

This way of combining a microcontroller with an analog Specific Component from SGA is a very effective way to create a small and versatile system.

#### ***Tell SGA about your microcontroller system***