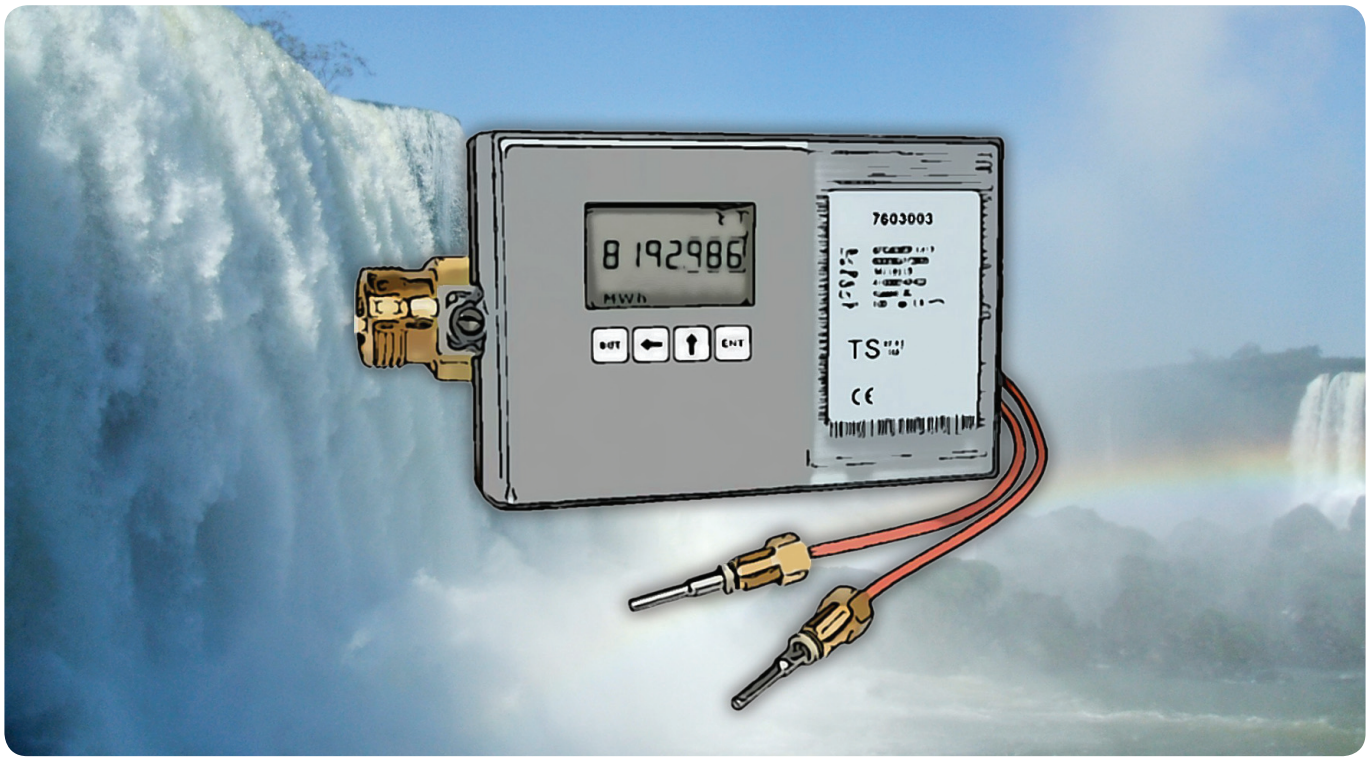
APPLICATION INFORMATION

Solutions for Gas and Water Meters



New electronic flow and heat meters have the advantage of microprocessor based technology. A good way to create a well optimized 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.

Flow meters

There are many variants in flow-meters, all with different concepts on how the flow is measured. Some examples of popular flow meter types include: Positive Displacement, Paddle Wheel, Differential Pressure, Turbine, Propeller, Coriolis, Electromagnetic, Vortex and Ultrasonic.

The signals from the flow sensor must be read in some way by the microprocessor, regardless of the principle used. This often involves filtering and amplification of week signals that might be differential. An ultrasonic sensor might for example also need a Fire-Pulse generator and a Time-to-Digital converter. A traditional mechanical meter detecting a rotation via optical or magnetic sensors might need signal shaping and encoding to calculate speed and direction. Some principles involve measuring absolute or differential pressure.

An analog ASIC realized as a Specific Component from SGA can take care of all the sensor specific functions and signal conditioning, making it sufficient to use a simple standard microprocessor. The standard microprocessor gives flexibility for future upgrades of the system. The Specific Component minimizes cost and size of the system.

specific components

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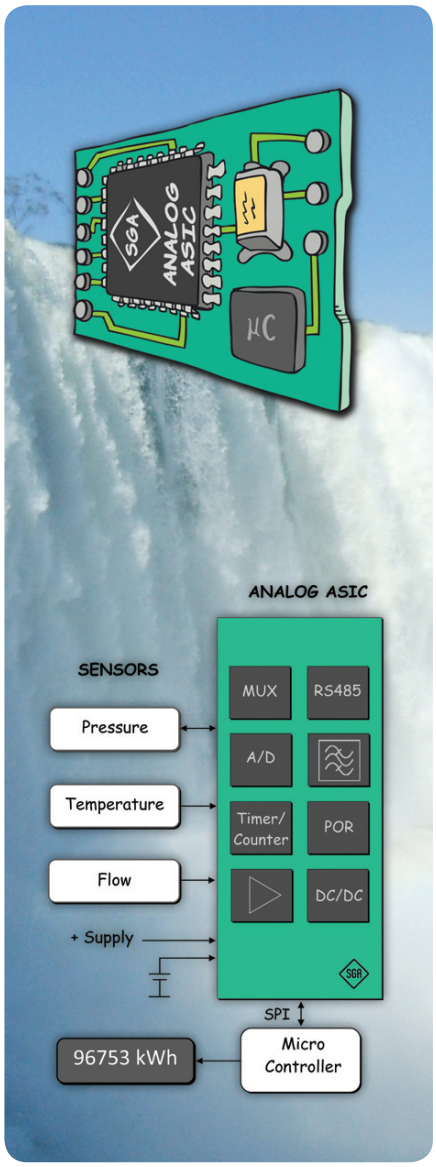

High Performance

Higher accuracy can be achieved by keeping sensitive analog functions outside the microprocessor. This will also 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 and a properly conditioned signal can reduce the resolution needed. A Specific Component from SGA developed for extremely low power consumption also guarantees a long battery lifetime.

Small Size

A Specific Component from SGA provides exactly what's needed in the application. External discrete components needed with standard solutions can normally be integrated, leading to a very small system footprint. The Specific Component can also be made configurable to allow programming of the inputs for different sensor types or measurements. This flexible approach minimizes the number of different hardware versions needed. In addition the design is better protected with an anonymous ASIC.

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 include DC/DC converters, LDOs, Watchdog, Power-On-Reset (POR), Battery Supervision and Supply Switch.

Communication between the microprocessor and the Specific Component can be done in many different ways but typically a serial interface like SPI is used. Drivers for RS485, RS232 or similar can be implemented allowing remote reading and communication with the meter.

Heat Meters

In addition to mass flow, heat (energy) meters measures the temperature difference between the inlet line and the return line. A Specific Component from SGA can measure ΔT with a very high precision and low current consumption. It can be made programmable to interface any type of RTDs (Pt100, Pt1000, …) and configured for both absolute and differential measurements.

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.

Contact SGA to see how we can help you

specific components

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