Technical Article

As the Wind Blows! Thewindop.com Uses MSP430 MCUs to Measure Real-time Wind Speed

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The extreme sport of kite surfing is only possible when the wind is just right, which is why several years ago the team at thewindop.com set out to solve the problem of obtaining finer spatial resolution for real-time wind speed. They would regularly drive 40 minutes to the beach to go kite surfing and too many times they would discover the wind was weak or too gusty. This meant a wasted journey. They needed point of interest, real-time, high-resolution wind speed data and it was simply not available. The team first looked into buying GSM/3G wind meters, but quickly realized the costs of large-scale deployment were prohibitive, so they began to build their own.

Over the past two years they have refined their design to create the ultra-low-power data sampler that is cAno™, which uses an MSP430™ microcontroller (MCU), to track and measure wind speed in real-time.

What Is cAno™ from TheWindop.com?

cAno™ is a solar powered autonomous data sampling device, created to make point of interest data available in real-time, so users can decide how best to spend their time, or to assist in environmental monitoring such as crop harvesting, safety in the workplace etc. In order to be able to do this, the sensor system needed to be low-power, low-cost and accurate. Right now, cAno™ is used as a wind meter to provide real-time data feeds from the beaches the team likes to kitesurf on.

What Makes the cAno™ Stand Out from Its Competitors?

Our wind meters only need sunshine and cell phone coverage to operate. They are ready to operate out-of-the-box wherever you want to put them. If there is no cell coverage, you can easily use Iridium. This is key, as we want to target “point of interest” sites, generally with limited connectivity and power options.

They are truly standalone autonomous data collection units. Various sensors can be added; it can also act as a sensor hub using XBee and the cAno™ 2, our next generation device, will further expand this function.

Why Did You Choose TI’s MSP430 MCU for Your Product?

We had some experience using the MSP430G MCU series and the low-power tools were good. We were very impressed with the low-cost MSP MCU LaunchPad™ development kits. All of this helped lower the financial barrier of entry and made the MSP430 MCU family very attractive.

Added to that was the benefit of the MSP430 MCU's low-power nature, multiple serial communication options and integrated Ferroelectric Random Access Memory (FRAM) architecture. The MSP430FR5969 MCU was a real game changer with the AES engine and more FRAM technology, which combines the best of Flash and static random-access memory (SRAM). It solved a lot of problems for us.

Where Do You See Your Technology/solution Going in the Next Five Years?

The world of connected sensors is exploding and I think there will be massive integration of all the required functions into one or two IC solutions. This will result in lower power, lower cost and smaller sized devices. Additionally, support and deployment of multiple radio standards will make variable rate bandwidth more affordable. The opportunity for access to real-time data streams is huge, so I can see thewindop.com project expanding into other types of real-time data sensing applications, indeed we already have plans to do so.

Resources:

- You can view the high-resolution data feeds right now at www.thewindop.com.
- Learn more about MSP430FR5969 MCU from this datasheet.
- Order now and get started developing with the MSP430FR5969 MCU LaunchPad development kit.

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