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SPE Industrial Partner Network announces the winners of the Single Pair Ethernet Design Competition 2023

5 winners from over 70 submissions - the winners of the SPE Design Competition have been announced and their projects were awarded at SPS 2023.

Nuremberg - 14/11/2023 --- In March 2023, the SPE Industrial Partner Network launched the Single Pair Ethernet Design Contest. The aim of the competition was to support exciting pilot projects based on Single Pair Ethernet. The competition was organised by the SPE Industrial Partner Network, together with the HARTING Technology Group, Würth Elektronik eiSos, Sparkfun, Analog Devices and Digi-Key. The best solutions in the three categories Best Industrial Application, Most Sustainable Application (Environmental) and Maker Scene were awarded live at SPS 2023.

The Single Pair Ethernet Design Contest, organised by the SPE Industrial Partner Network e.V., was launched in March 2023. The aim of the competition was to identify and award prizes to the best pilot projects based on Single Pair Ethernet. After submitting and reviewing their project idea, the applicants received an SPE developer board from Sparkfun Electronics as a common basis for development. The type of application was not fixed. Prizes were awarded in the categories Best Industrial Application, Most Sustainable Application (Environmental) and Maker Scene. In total, the evaluation committee received over 70 project ideas, 21 of which made it to the final evaluation. On 14 November, live at the SPS trade fair in Nuremberg, the winners were presented and awarded.

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Category: Best Industrial Application

WINNER: BELDEN DEUTSCHLAND GMBH

Project: IO-Link to SPE 10BASE-T1L Gateway

The LioN-H is a Mini IO-Link Master with Single Pair Ethernet, supporting the 10BASE-T1L Standard for data transmission up to 1 kilometer. It's a concept study which was made at BELDEN to show, how to easily integrate standard I/O and IO-Link signals into a SPE network with EtherNet/IP. Therefore, it has two cordsets for the connection of standard inputs, standard outputs or IO-Link signals. In addition, it has a power connection with an M12 L-coded cordset as well as an SPE uplink cordset for the connection to a switch or PLC.

Category: Most Sustainable Application (environmental)

WINNER: MAGNETIC COMMUNICATION CORP.

Project: Control system for farming via SPE

Magcom presents the closed-loop Single Pair Ethernet (SPE) system aimed at environmental conservation, harnessing the capabilities of SPE for long-distance data transmission, robust connectivity, and efficient energy usage.

Temperature and humidity data can be stored and managed locally and accessed on mobile devices. From a remote location, a mist diffuser (an example of cooler in the field) can be activated manually or automatically when the temperature exceeds a preset limit. This system enhances efficiency and facilitates data-driven decision-making by not only monitoring but also by taking immediate actions.

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Based on the game changing technology, the system can be customized to suit various applications in fields such as medicine, infrastructure, plant engineering, surveillance systems, agriculture, and wind energy and so on. Magcom leverages its Discrete Magnetic Technology (DMT®) to carry out your demands for increased automation efficiency and a more sustainable future.

In the MAKER SCENE category, prizes were awarded to the three best solutions that were not tied to any specific subject areas or fields of application. They were intended to illustrate what is technically possible with SPE, even outside of typical industrial applications.

Category: Maker Scene

1. PLACE: SCOTT RAPSON | ELECTRIC UI | ST. PETERS, SOUTH AUSTRALIA

Project: Deep-sea sensor node / New PD and PSE function board

The project evaluated the practicality of using SPE as a single cable solution for marine research sensor node tethers by implementing a custom 10Base-T1L and Power Over Data Line (PoDL) board using the Sparkfun MicroMod form-factor.
The SPE implementation was packaged with a 200m depth-rated enclosure with custom backplane PCB, 3D printed mounts, and an ESP32 to manage high-resolution pressure and temperature sensors.

To demonstrate the sensor node in the field, it was non-invasively mounted to a jetty next to a local dive reef and allowed real-time sensor review and recording at the surface.

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Category: Maker Scene

2. PLACE: MD. KHAIRUL ALAM | DHAKAR, BANGLADESH

Project: Control system for drinking water tanks in residential buildings

All multi-storied buildings have one or more water tanks on the rooftop for distributing water on all floors. The main reservoir is placed in the ground and is usually filled by the utility supply. An electric pump pumps the water from the reservoir to the water tank on the rooftop. In most of the buildings in Bangladesh, the system is manual and a person manually turns off the pump when the water tank becomes full. This manual process always creates a waste of valuable water and indirectly creates a waste of electricity. An automatic system can solve the problem and save a large amount of water and electricity by automatically turning off the pump when the water tank becomes full and turning it on again when the tank needs to reload.

The project tries to solve the problem by an automatic system and the main problem was establishing a reliable communication between the water tank on the rooftop and the water pump on the ground. Finally, the problem was solved by Single Pair Ethernet Communication. SPE can be the most suitable communication technique for communicating from rooftop to ground for a multistoried building as single-pair ethernet can reliably work for more than 1 km.

Category: Maker Scene

3. PLACE: JULIAN BLANCO |NORTH STONINGTON, CT, UNITED STATES

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Project: Acustic Monitoring Buoy

The goal of this project is do basic underwater acoustic monitoring. The bottom unit consists of 4 hydrophones, a temperature sensor, depth sensor, an acoustic data acquisition system from Applied Ocean Sciences, and a Single Pair Ethernet transceiver.
Messages from the bottom unit will be transmitted up the tether to a surface buoy where a radio (cell or xbee TBD) can pass the message to shore.

The winners were awarded at the annual press conference of the SPE Industrial Partner Netzwerk e.V. and were presented with their prizes and certificates by the association's board.

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Image:

The proud winners at the award ceremony at SPS 2023 - Svenja Litz from BELDEN Deutschland GmbH, Jennifer Lai, Dennis Lee CTO, Jon Yeh all from MAGNETIC COMMUNICATION CORPORATION

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Via the partner network:

The SPE Industrial Partner Network is based in Rahden in Westphalia and is an equal alliance of companies that promote Single Pair Ethernet technology as the basis for rapid and successful growth of IIoT. The aim of the association is to establish SPE on the market as a new Ethernet technology in the sense of a comprehensive ecosystem with all necessary components.

We also see ourselves as a partner of the Industrial Ethernet user groups and would like to support them in the adaptation of this new "physical layer" for PROFINET, EtherNet/IP, CC-LinkIE, for example.

The bundling of competences of the individual companies should give users an investment security to invest in this technology. Other interested companies are welcome to become new members. Shaping the future together - talk to us!

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