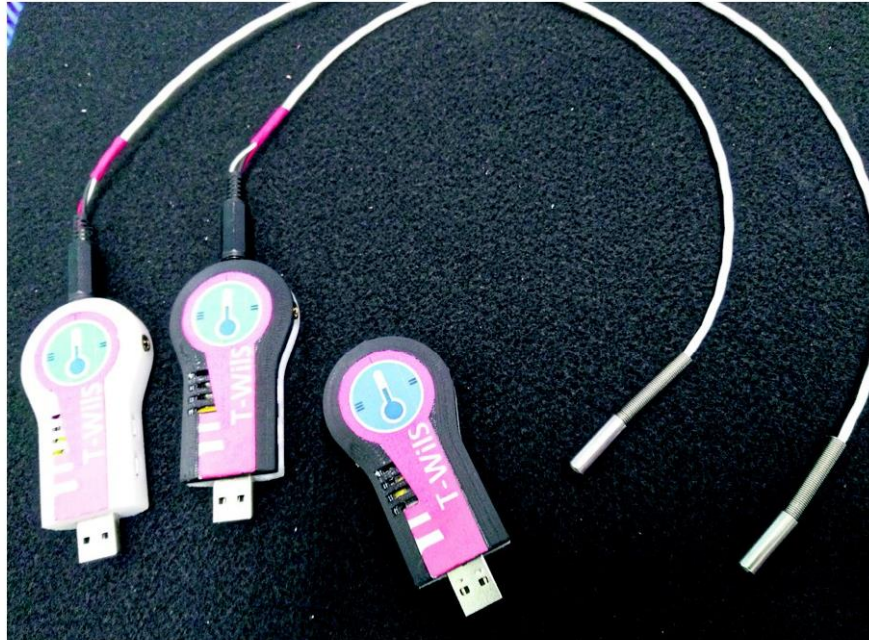


BRAVE NEW WORLD



Connected via Wi-Fi, a temperature sensor with wireless sensor on internet system is placed for temperature monitoring, and displayed the result on smartphone, tablet or PC.

Innovations allowing inanimate objects to 'talk' helps streamline food production and other industry efficiencies

STORY: SASIWIMON BOONRUANG

Thailand's agricultural, energy and medical sectors have seen efficiency improvements thanks in large part to the research and micro-electronics products produced by the Thai Microelectronics Centre (TMEC) under the National Electronics and Computer Technology Centre.

These innovations can be categorised into two major groups — technology platform and applications. Examples are Ion-sensitive field effect transistor (ISFET), temperature sensor, micro-electro-mechanical system (MEMS), and A Large Ion Collider Experiment (ALICE) collaboration project.

MEMS, for instance, has been applied in many types of sensors used in several industries such as automotive, bio-medical technology and telecommunications. In the logistics industry, micro-electronics technology plays a significant role in monitoring temperature. TMEC has realised the importance of the cold chain management, a temperature-controlled supply chain man-

agement, especially in the agriculture, medical, food, and energy.

So far the centre has developed a blood pressure sensor and equipment for measuring weather pressure for various sectors.

Rungtawee Piyaanjanjaratsri, TMEC's senior research assistant, noted that a team of researchers has developed a temperature data logger solution, which is being used at Siriraj Hospital and the Thai Red Cross Society to ensure that blood, vaccine and medication are kept at appropriate temperatures.

At Siriraj Hospital, the application of a temperature data logger also runs on a wireless system, allowing users to monitor the temperature on mobile devices.

"Comparing to imported equipment, our mobile temperature data logger system enables users to save a high cost," said Rungtawee, adding that the system was designed for ease of use as one piece of equipment can connect to four sensors.

TMEC also designed agricultural equipment using the internet of things technology

that allows a network of physical devices to collect and exchange data affecting plant growth such as light, temperature, and humidity.

A research team developed sensors to collect data on soil moisture in tomato and sugar cane farms in Suphan Buri and Nakhon Ratchasima provinces. The system

enables the farmer to water crops at the right quantity based on soil condition.

The smart farming system includes a soil moisture sensor, temperature and humidity sensor, solar sensor, water pressure sensor and chemical sensor.

Farmers can monitor the system and make adjustments 24 hours a day through a web-based monitoring program. The system monitors factors that affect plants and warns farmers to potential problems. The system can be applied to any type of plant.

"The application also helps farmers predict productivity for a whole year," said Montree Saenlamool, TMEC's assistant researcher.



Mobile temperature data logger system has been used at Siriraj Hospital to ensure that blood and vaccine are kept at an appropriate temperature.

“Innovation made by TMEC should enhance and modernise the agriculture sector

TMEC has been recognized internationally, participating in the ALICE (A Large Ion Collider Experiment), hosted by CERN — the European Organisation for Nuclear Research — in 2014, and has been approved as an associate member of the ALICE Inner Tracking System Upgrade project.

Science and Technology Minister Dr Pichet Durongkaveroj recently visited TMEC, saying he wants to see the centre expand its technology across clusters of industries, such as automotive, electrical appliances, telecommunications, agriculture and medical, in order to help streamline production and improve efficiencies.

According to the minister, TMEC as a primary organisation in micro-electronic technology research and development, should support Thailand's electronic industry in implementing the use of micro-sensor technology due to the growth of internet of things (IoT) technology.

“In agriculture, the innovation made by TMEC should enhance and modernise the agriculture sector as the centre is capable of working out a bigger scale of application that better serves the sector,” said Dr Pichet.



A function of soil moisture control system can be monitored via the intelligent web application monitoring.