CTWINS

MULTIPLE REDUNDANT SENSORS

PATENT TECHNOLOGY

Patent No. 102024000001404-2024

CEAM© Control Equipment

Smart Elettronic Sensors Division

OBSERVATION

Over the years the importance of measurement sensors has gone from being something
accessory to something fundamental for the increasingly numerous monitoring and control data acquisitions, but above all for the increasingly widespread automations often unattended by anyone and also thanks to the spread of IOT systems, an ever-increasing demand for sensors has been created, which in this general context it becomes strategic to be able to count on increasingly reliable and precise products even at increasingly competitive prices.

The IDEA

After having studied the problem in depth, thanks to our know-how we have developed a new technology that represents the solution. In practice, taking inspiration from what has always been done in cases where greater security is desired, i.e. the sensor is doubled, even if in the end by carefully analyzing the result we obtain with traditional technologies we do not really obtain greater security, but often only a doubling of the cost and greater management difficulty, which ultimately translates into greater uncertainty, because except in the case of drastic breakage of one of the two sensors (a condition that rarely occurs), nothing warns us in the most frequent case in which the two sensors for a thousand reasons begin to generate different data, being impossible to understand which is the correct one?

OUR SOLUTION

Thus was born the patented CTWINS Multiple Redundand Sensors technology (Patent No. 102024000001404 - 2024).

The idea is to insert three or even more measuring elements in physical parallel into the body of a single sensor, all acquired individually by the innovative and
powerful electronic control system developed for these new sensors. Which in real time with extremely fast and sophisticated algorithms, which we will not explain here for reasons of space and company know-how, analyzes all the data received, compares them with the averages of the individual pairs and how a piece of data modifies an average, the system carries out further congruence checks and finally excludes from the calculation and therefore from the final measurement the sensitive element that no longer falls within the accepted tolerance that the user can configure beforehand and continues to operate with the average of the remaining sensors, which however, it is always a much higher level of safety than traditional sensors, while obviously signaling that it is operating in emergency mode.

The sensors with CTWINS technology are therefore usable and interchangeable with traditional sensors, all this control takes place automatically and independently within the smart sensors.

Thanks to CTWINS technology, now it is possible to rethink the sensors, especially the most critical and decisive ones in the various processes, where with a small additional investment it is possible to truly obtain higher levels of safety, unthinkable until now except with very expensive and very complex systems, up to currently reserved for the military and aerospace.

COMPARATIVE EXAMPLE OF INDUSTRIAL SENSOR

EXPLANATON

In the graphic alongside, a comparative example has been shown with on the left a measurement probe with traditional technology, therefore with only one sensitive element, while on the right an example of a probe with CTWINS technology which has three elements inside physically sensitive in parallel, but there could be even more.

But in both cases, as can be seen in the graph, the probes produce only one output, in the case of the traditional probe on the left, it is the only classic one, while in the CTWINS hypothesis on the right, there is always only one output but which is the result of a complex mathematical redundancy process, therefore in the event of a sensor anomaly, the probe continues to function correctly and the measurement will also be correct, furthermore the CTWINS technology, in addition to being more reliable, also allows maximum precision to be guaranteed possible over time, thanks to the principle of self-control that constantly carries out over time.

In the graphic example the type of size of the probes is not specified, simply because the CTWINS technology is transversal to all types of physical sizes so it makes no difference whether we are talking about a temperature or humidity or pressure or any other greatness.

Over time CEAM will make CTWINS available on all next generation smart sensors, starting from Temperature&Humidity which will be the first available...

COMPANY WITH QUALITY SYSTEM CERTIFIED ISO 9001:2015

CTWINS MULTIPLE REDUNDANT SENSORS

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DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 56954-2009-AQ-ITA-SINCERT

Initial certification date: 02 July 2009

Valid: 11 October 2021 – 02 July 2024

Expiry date of last certification cycle: 02 October 2021

Date of last re-certification: 15 September 2021

This is to certify that the management system of

CEAM CONTROL EQUIPMENT S.r.l - Sede Legale ed Operativa

Via Val d'Orme, 291 - 50053 Empoli (FI) - Italy

has been found to conform to the Quality Management System standard:

ISO 9001:2015

This certificate is valid for the following scope:

Design, production, installation and assistance of thermocouples, furnaces assembly of components for control equipments and system process regulations. Calibration service for temperature, pressure, humidity, electric resistance, voltage, current transducers and relatives industrial instruments and combustion analyzer

(IAF: 19)

Place and date: Vimercate (MB), 11 October 2021

ACCREDIA

For the issuing office: DNV - Business Assurance, Via Energy Park, 14 - 20871 Vimercate (MB) - Italy

Zeno Beltrami, Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV Business Assurance Italy S.r.l., Via Energy Park, 14 - 20871 Vimercate (MB) - Italy - TEL. +39 039 68 99 905 - www.dnv.it

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