User report Noffz - short version

INDUSTRIAL ROBOTS AS AN UNUSUAL MEASURING TOOL FOR TESTING RADAR SENSORS

More and more radar sensors are being installed in modern cars today. These increasingly complex sensors must be tested and calibrated during production in order to deliver reliable results during operation. NOFFZ Technologies GmbH develops and produces test and automation systems for these tasks. Industrial robots from Mitsubishi Electric are used as unusual measuring equipment that ensures high precision in movement.

The challenge

Automated testing and calibration of radar sensors

Sensors based on radar or other technologies play an important role in modern motor vehicles. This is because they support the driver with assistance systems for semi-autonomous or autonomous driving. Modern radar sensors are complete systems, sometimes consisting of dozens of radar antennas and integrated signal processing. Due to this complexity, they have to be tested and calibrated as part of quality assurance. The medium-sized company NOFFZ Technologies GmbH has developed the Universal Tester Platform (UTP) for this task, which the company sells worldwide. The exact positioning and movement of the radar sensors in the test chamber is particularly challenging. In the first versions, the test specimens were tilted in two directions in order to simulate the horizontal and vertical position of an object to be detected. However, this separate adjustment of azimuth and elevation no longer fulfils the increased requirements of modern radar sensors. The test object must therefore be able to move around both axes simultaneously in order to simulate that the entire field of view is covered.

Solution

Industrial robots as measuring equipment

NOFFZ decided to enable the movement of the test specimen using an industrial robot from Mitsubishi Electric's MELFA-FR series. The task of moving the test specimen within the system as required places high demands on the robot used. Absolute accuracy and repeatability were particularly important. In the systems, the robot is used more or less as a measuring device. The mathematical centre of the sensor (centre of rotation) must always be at the centre of the rotational movements during the calibration run of the test specimen in the test system. In addition, the robot movement and calibration program must be precisely synchronised, which is why NOFFZ uses a real-time controller to control the robot directly. An embedded system calculates the path movements for the robot from the required movements of the radar sensor in the measuring chamber.

Result

Universal system

The radar sensor is calibrated directly during the test. The calibration parameters are written to the sensor module, in which a DSP is installed in the more complex radar sensors. The sensor is then usually tested again. The entire process takes between a few seconds and a good minute. The UTP software is designed in such a way that the measurement task can only be created by parameterization. The customer therefore no longer needs to program the system once it has been commissioned.

Quote

"For our universal tester platform, we use open systems wherever possible, which is why we also rely on the robots from Mitsubishi Electric, which offer an open interface for control."
Markus Solbach, Managing Partner, NOFFZ GmbH

Characters with spaces: 3311

If you are interested in the long version (9083 characters with additional images), please contact Silvia von Dahlen (see press contact)!

Author

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Weitere Informationen:

Videolink: https://www.youtube.com/watch?v=Wz48bXb2HyQ

Produktseite: https://www.noffz.com/testsysteme-anlagen/universal-tester-plattform/catr-radartestsystem-utp-5069/

Images

ME_Noffz_Bild 1.jpg: Source NOFFZ

The Universal Tester Platform **UTP** from NOFFZ tests and calibrates radar sensors that are used in automotive applications, for example.

ME-Noffz_Bild 5.jpeg: Source Noffz

Up to 10 sensors are already installed in modern cars today. And the trend is rising!

ME_Noffz_Bild 6.jpg: Source NOFFZ

"With our Universal Tester Platform (UTP), however, we have created a modular system with a high degree of standardisation," says Markus Solbach, Managing Director of NOFFZ Technologies.

About NOFFZ

As an owner-managed company, NOFFZ has been developing test and automation systems for a wide range of products from various industrial sectors since 1989. What began in the basement of their own home is now a globally active and well-known manufacturer with currently more than 250 employees: at the company headquarters in Tönisvorst near Düsseldorf and at eight other locations in Germany, the USA, China, Mexico, Hungary and Serbia. NOFFZ's intelligent solutions are established in the automotive and telecommunications industries as well as in the application areas of IoT (Internet of Things), consumer electronics, smart homes, medical technology and the semiconductor industry.

www.noffz.com

About Mitsubishi Electric

With over 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric is a globally recognised leader in the manufacturing, marketing and sales of electrical and electronic equipment for information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, mobility and building technology, and heating, cooling and air-conditioning technology. In line with its corporate philosophy of "Changes for the Better", Mitsubishi Electric strives to be a global leader that enriches society with technology. With around 146,500 employees, the company achieved consolidated sales of 36.7 billion US dollars* at the end of the financial year on 31 March 2022. Sales offices, research companies, development centres and production facilities are located in over 30 countries. Mitsubishi Electric has been represented in Germany since 1978 as a branch of Mitsubishi Electric Europe. Mitsubishi Electric Europe is a wholly owned subsidiary of Mitsubishi Electric Corporation in Tokyo.

**Exchange rate 122 yen = 1 US dollar, as at 31 March 2022 (source: Tokyo Foreign Exchange)*

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