CAN Newsletter Online

TEMPERATURE MEASURING IN CARS

CAN-connectable sensors enable new functions

Preh (Germany) has equipped its temperature sensors with a CAN interface. They can be placed variably and can implement climate control algorithms.

(Photo: Adobe Stock)

No matter if warm or cold. Every person has their own individual temperature of wellbeing and this affects its behavior. As American psychologists found out during a test in South Carolina, the driving behavior of the test person changed if they froze slightly or if it was too hot. When it was very hot in the vehicle, they drove more aggressively and honked the horn much more often, if the vehicle in front did not start fast enough at a green traffic light.

The right temperature is therefore not only a question of comfort, but also one of safety. Air-conditioners installed in vehicles regulate the optimum temperature at all times. One of the challenges here is the continuous and precise monitoring of the interior temperature. In the past, fans and temperature sensors (NTCs) were used for this purpose. The indoor air was sucked in by the fan and flowed past the temperature sensor. Since various disadvantages were associated with this (relatively expensive, relatively large installation space requirement, fan noise, and limited service life), faness temperature sensors have been state of the art for about ten years.

The fanless temperature sensors used so far are mostly analog stand-alone solutions. This means that a sensor measures the temperature at three positions and provides it to a control unit. This then calculates the indoor temperature as a parameter for climate control. However, future customer requirements go even further as though they cannot be met with an analog component anymore. "Digitalization in the vehicle continues to grow faster and faster. In the meantime, LIN sensors are used. Thanks to this vehicle protocol language, we can also implement the calculation software directly in the sensor and thus 'relieve' the ECU", explained Claudia Guck from Preh.

Integrated in roof / headliner   Integrated in dashboard   Integrated in B-/C-pillar

Integrated in steering column   Integrated in mirror cover   Integrated in climate controls

CAN-linked temperature sensors can be placed far away from the air-conditioning ECU (Photo: Preh)

For future vehicle generations this will no longer be sufficient. A sensor communicating via LIN protocol is limited in terms of data volume and transmission speed. For this reason, the next sensor generations at Preh will also be available with CAN interfaces. A CAN-connectable sensor contains not only the software for temperature determination, but also the climate control algorithm. Due to the higher data throughput, significantly more functionality can be combined on a CAN temperature sensor.

There are also new possibilities for placement: As a stand-alone sensor, the temperature sensor can be adapted to the given contours of the interior design or installed in a design element invisible from the outside. The placement is not more determined by the position of the ECU.

In addition to the integration in user interfaces, a wide variety of installation positions for the temperature sensor have been tested and implemented in series developments, including in the B and C columns below the steering column, in the headliner, etc.

In cooperation with one carmaker, Preh is currently developing a sensor that does not only determine the temperature but also the humidity on the windshield. The sensor is placed at the bottom of the rear-view mirror. "The temperature and humidity sensor is optimally positioned directly on the windscreen. That way, we can quickly detect the humidity that is generated, such as during rain, and take measures to prevent the windscreen from fogging up. Due to the possibilities offered by the CAN-supported sensor, it is also possible to think about function extensions. Here one can imagine the control of the windscreen wipers, but also the integration of the automatic light function and the solar radiation in one and the same sensor," said Claudia Guck.

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