

Climatic conditions are crucial in the luxurious world of the modern automobile. How long it takes to heat up a car in winter or how long the air conditioning needs to stabilize a pleasant interior temperature on hot summer days influences customers' buying patterns. Thus, Volkswagen performs thousands of tests every year to help development engineers improve the climatic conditions inside the passenger compartment. For that purpose, imc's SPARTAN measurement system is the top choice.

The following example shows some measurement curves acquired in an air-conditioned wind channel. The starting position is a temperature of 0°C both inside and outside of the car. The temperature measurement points are the driver's and the front-seat passenger's foot-room, chest-room and head-room as well as the outside the car. The temperature inside of one ventilation shaft was taken, too. In addition to the temperature measurement, voltage signals from the fans were also part of the Volkswagen development

engineers' program. The sampling rate of all signals is 100S/s.

The picture below shows the car's start up process. The desired temperature was 30°C. After a short heat-up procedure of approx. 8 minutes, a control mechanism to stabilize the temperature starts to work. Now the desired temperature has been nearly reached.

Apart from the ability to measure RTD signals as well as thermocouple signals, the system has to be able to measure a number of voltages. Due to the presence of different reference grounds, the system inputs are isolated. Voltages up to 50V can be measured directly. Another requirement for the imc system is its self-start capability. It can be used without a PC and the built-in display shows all measured values. A PCMCIA storage of 500 MByte stores the data. Online calculations such as the mean-value of all passenger compartment temperature measurement points can be performed with the system, as well.

