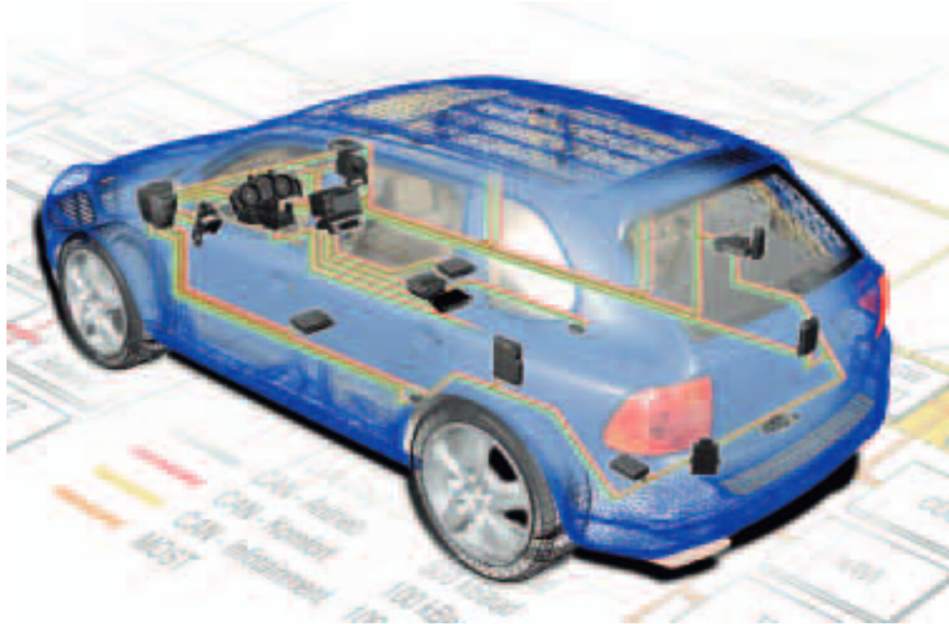


Networked Systems in the Cayenne

Communication and Data Transmission



A fully networked system takes care of all electronic data exchange in the Cayenne.

With its move into the Sport Utility Vehicle segment, Porsche simultaneously struck out on a new path in terms of communication and data transmission between electronic control units in a vehicle. This path is embodied in the new optical-based technology (MOST: Media Oriented Systems Transport) which was used in the Cayenne in addition to the more familiar network architectures. Its MOST-based infotainment system makes Porsche one of the first constructors to offer a scalable and modular concept in this area.

The tide of digitalization has brought with it a wealth of data from various sources that must be transmitted and exchanged within a vehicle. Chassis and security systems (automatic transmission, brake system, etc.), comfort electronics (air-conditioning system, ParkAssist, etc.) and infotainment (navigation, radio, telephone, etc.)

are reliant on electronic information, indeed they are controlled by this data. Traditional electronic concepts would not be able to cope with the high requirements that the Cayenne demands in this area, so Porsche installed a fully networked system, in which some 40 control units take care of a comprehensive range of tasks.

To ensure that the control units can communicate perfectly with one another, suitable transmission technology and a practical system architecture was required. To this end, Porsche decided to break down the complex vehicle electrical system into more manageable subsystems, in which each electrical control unit was classified accord-

ing to specific aspects. Environmental conditions (installation location), security issues (error protection, real-time), data transmission capacity, operational relevance and the specific electrical properties of the unit were among the criteria applied. On the basis of this classification, the vehicle was divided into electrical units, into the main vehicle segments and vehicle sub-segments. These units are linked to one another via special gateway control units and can thus exchange data. The main vehicle segments include the areas of drive, comfort and infotainment. They are equipped with what are called system busses, which were selected in line with the relevant requirements. In addition to

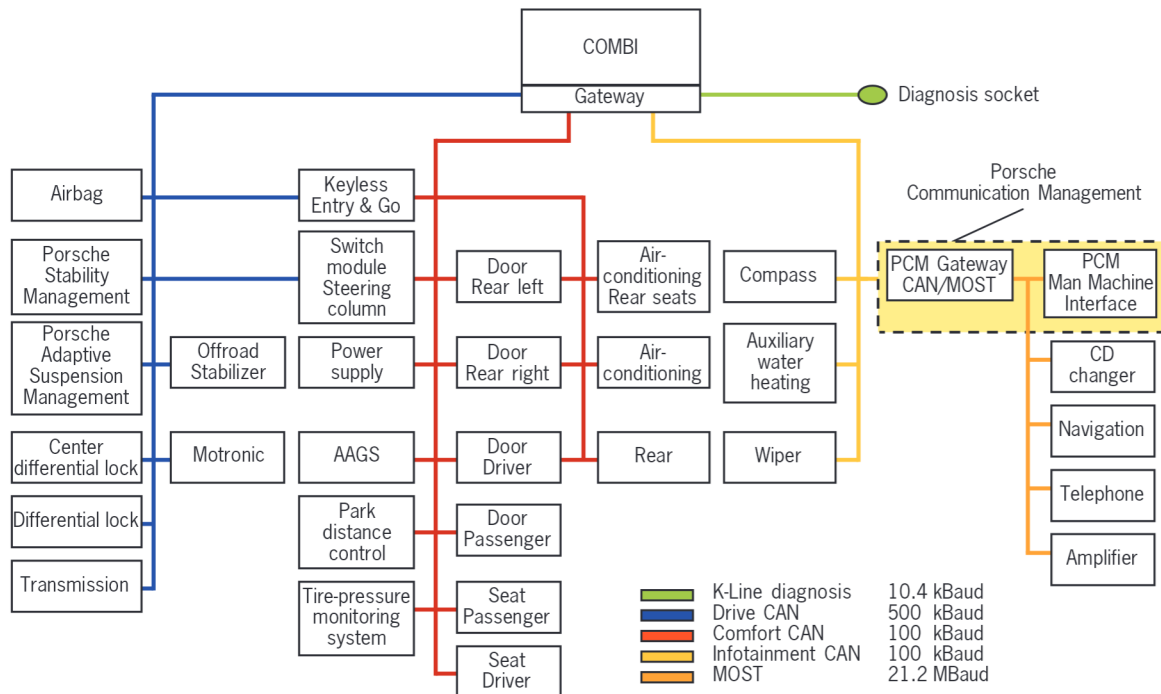
these system busses, there are also a number of sub-bus segments which connect the sensors and actuators locally.

Controller Area Network (CAN): Basic networking technology

CAN is used in the Cayenne as the basic technology for the drive and comfort segments. The different requirements in these areas call, inter alia, for different CAN physical layers. The CAN (Class C) used in the drive segment works at a transmission rate of 500 kBit/s and is operated via a high-speed physical layer. It supplies, for example, the automatic transmission or brake systems with the information they require. In the comfort segment the

CAN (Class B) works with a transmission rate of 100 kBit/s and controls, e.g. the air-conditioning system or the ParkAssist. Here a low-speed physical layer is used.

The physical layer chosen depends on the desired transmission rate, the wakeability of the bus system and its error tolerance and error traceability. For example, a wakeable system requires a decentral network management system that allows the system to be woken by defined components in an event-controlled manner. In contrast, the drive segment is only activated upon ignition.



Position and arrangement of networks in the Cayenne for the drive, comfort and infotainment segments