

CAN data transmission via a radio link

Company
Schildknecht AG
Haugweg 26
DE-71711 Murr
Tel.: +49-7144-89718-0
Fax: +49-7144-89718-29
office@schildknecht.ag

Link
www.schildknecht.ag

The Dataeagle 6000 by Schildknecht (Germany) is a device, which may substitute the cables in CAN networks. It is able to transfer CAN messages on the data link layer (ISO/OSI layer 2) in a bidirectional manner. Therefore, the data transmission does not depend on the used higher-layer protocol. The CAN messages are received, checked and acknowledged by the device. Then, these are forwarded to one (point-to-point) or several (multiple-point) receiving devices via a radio link. To relieve the radio link, a whitelist containing the CAN-IDs of the transmitted messages may be created. A direct modulation of the CAN signals via the radio link is not possible. The device supports bit-rates of 10 kbit/s, 20 kbit/s, 50 kbit/s, 125 kbit/s, 250 kbit/s, and 500 kbit/s. Transmission of the 11-bit and 29-bit CAN-IDs (identifiers) is possible. The radio unit comprises the technique for transmission via short distances e.g. via

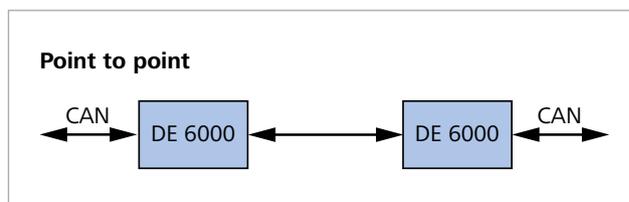


Figure 3: Point-to-point connection

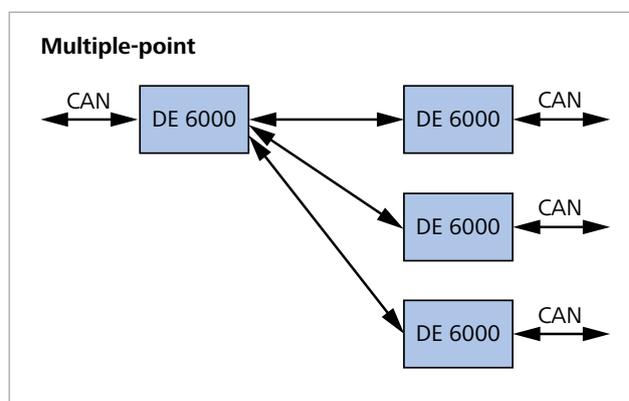


Figure 4: Multiple-point connection

Bluetooth (up to 500 m) and long distances via an 869-MHz (up to 3 km) link. The latency time (caused by radio transmission) of a Dataeagle device delays the signal transmission by ca. 2 ms.

The CAN-connectible Dataeagle 2000 version is

also available from the company. This does not transmit the messages in a 1:1 manner but extracts the data content of a CAN message and sends it to the another Dataeagle 2000 device (receiving partner). The receiving partner may also provide another network in- ▶



Figure 1: DE 6000 used with a CAN module by Helmholz on a S7 PLC



Figure 2: DE 6000 with a controller of Bernecker + Rainer coupled to a S7 PLC

interfaces such as Profibus DP, Profinet, and Modbus. Thus, the unit works as a protocol converter via a radio transmission. For example, by means of the unit, information from a Profinet-capable S7 PLC (programmable logic controller) by Siemens (Germany) may be transferred to a CAN-capable PLC by Bernecker + Rainer (Austria) via a wireless link. Different radio transmission technologies are possible. The linking is independent of the transmission technology. The common memory area is transmitted. The compact version of the unit (DE 2000 compact) provides 18 digital

I/Os, six analog inputs (0 V to 10 V) and six analog outputs (0 V to 10 V).

Lifting device for heavy loads

The CAN-connected Dataeagle 6000 (DE 6000) was used in a heavy-load lifting facility from the German lifting system manufacturer Krah. The incorporated electronics was developed by E.R.S (Germany). The facility is able to lift, position and move loads weighting several tons. Therefore, four independent legs (each equipped with a PLC) are controlled and synchronized via a wire-



Figure 7: Electric control cabinet for a leg of the lifting facility



Figure 5: Lifting device for heavy loads



Figure 6: Lifting facility applied in Russia

less link. The PLC is from Bernecker + Rainer. It uses CAN for internal communication and the DE 6000 for the radio transmission. The latter transparently transmits data via a 2,4-GHz Bluetooth connection every 20 ms from a master leg to the three slave legs. Thereby, the current leg positions are permanently exchanged and supervised. This shall be done to avoid the shifting of the load. Former, without this safety function, severe accidents and damages to persons were happened. Since several years, the Bluetooth transmission has proven to be non-sensitive to disturbances if compared with the WLAN, Zigbee, Nanonet or DECT wireless technologies. Figure 6 shows a lifting facility used in Russia. The system heaves and moves tones of loads. Such systems are applied for raising the tall loads, because no crane may be used in these cases. For raising tasks two legs and for transportation tasks four legs of the system are used and synchronized.

to-machine) applications. Beside the data transmission it enables data storing in the cloud and also message transmission to the smartphones via Twitter. For the latter function the appropriate input of the PLC has to be activated.

Olga Fischer

For M2M applications

The Dataeagle 7000, which can also be delivered with a CAN interface, was designed for M2M (machine-