

# Communication

## CANopen and DeviceNet

### CANopen (Controller Area Network) and DeviceNet

The CAN protocol was originally developed for the European automotive industry, so as to replace expensive cabling by an affordable network cable. Today, it is also used in the field of automation for transmitting process data between control systems, decentralized

I/O modules, drives, valves, etc. CAN features a high level of transmission security, since large portions of the monitoring mechanisms have been implemented directly in the CAN chip. DeviceNet and CANopen utilize the physical structure and the data transport mechanisms of CAN (Controller Area Network). The difference lies in the transmission protocols. DeviceNet and CANopen can be used correspondingly for the AC500 and AC31 controller series and for field-bus-neutral FBP devices (decentralized I/Os and intelligent switching devices), via the CANopen-FBP plug connector.

#### Data transmission

Two types of message have been defined: I/O data transfer and direct link. I/O data transfer is used for time-critical process data, while the direct link can be, for example, used for diagnostic messages.

#### Bus access for subscribers

The connection ID with the lower address has higher priority on the bus. Data is transmitted by the source, while the sinks (i.e. receivers of the data) have likewise been specified during the configuration phase.

#### CANopen

The bus operates on the master/slave principle with one master and up to 127 slaves. A shielded twisted-pair cable is used, according to ISO 11898. Cable lengths and transmission rates: from max. 40 m at 1 MBit/s to 1000 m at 20 kBit/s.

#### DeviceNet

The bus operates on the multi-master and/or the master/slave principle, with up to 64 bus subscribers. Two types of shielded twisted-pair cables are used: trunk cable for the main line and drop cable for the branch line.

# CANopen



Transmission rate	125 kBit/s	250 kBit/s	500 kBit/s
Max. cable length of trunk line Trunk cable	500 m (1610 ft)	250 m (820 ft)	100 m (328 ft)
Max. cable length of trunk line Drop cable	100 m (328 ft)	100 m (328 ft)	100 m (328 ft)
Max. cable length per branch line Trunk cable/Drop cable	6 m (20 ft)	6 m (20 ft)	6 m (20 ft)
Max. cable length total branch line Trunk cable/Drop cable	156 m (512 ft)	78 m (256 ft)	39 m (128 ft)

#### Diagnostics

Detailed diagnostic messages for rapid trouble-shooting are shown on the CPU display. In addition, the device status is indicated at the communication module by four LEDs.