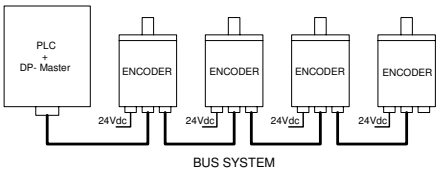
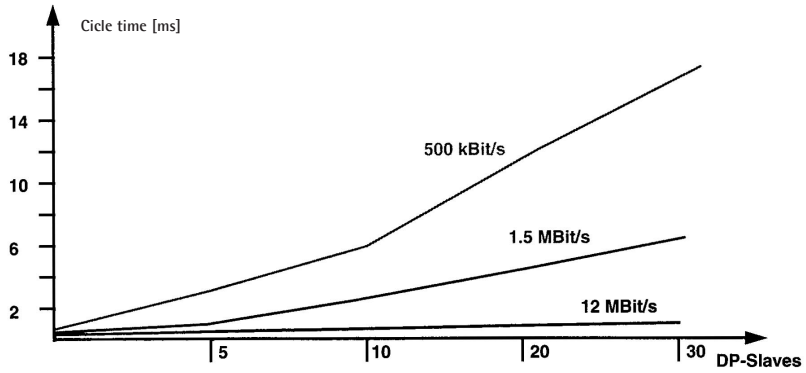
PROFIBUS-DP

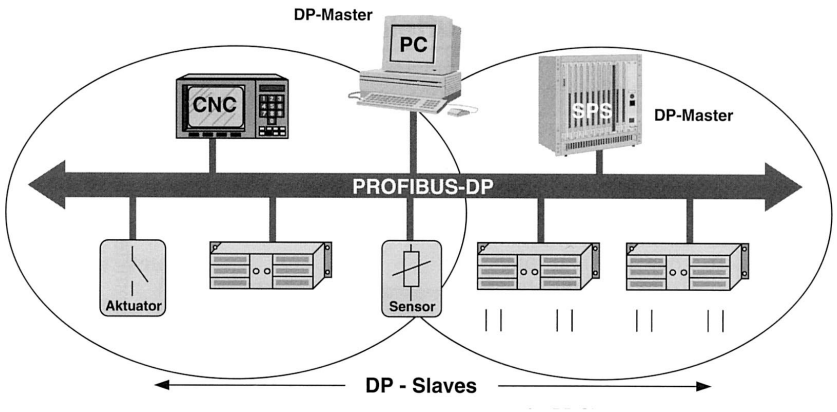
Profibus-DP is a communication system which consist of a Master or system manager, slave units and a two wire cable for data transmission.



The Master can connect up to 125 Slaves, divided into groups of 32, through a special two wire cable designed for high speed transmission up to 12 Mbits.



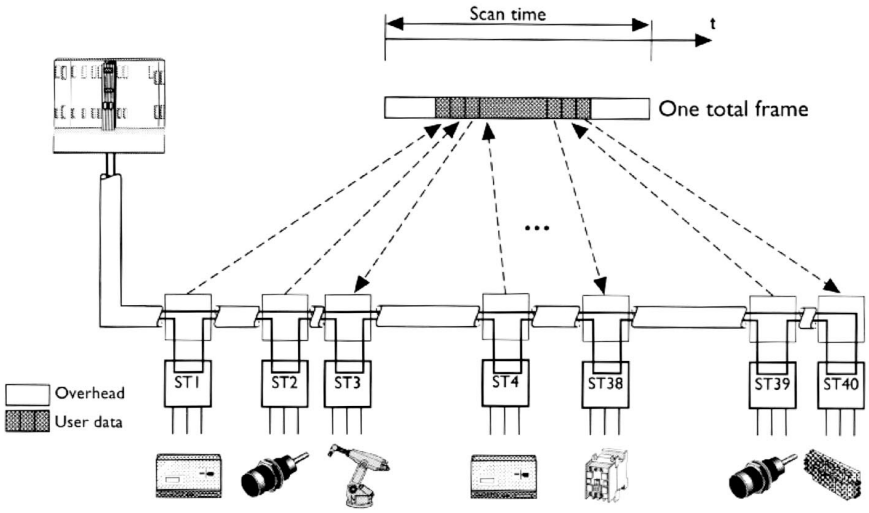
Slave units can be installed and recognized by the Master by means of the configuration file .GSE (or .GSD, .GSI depending upon the used language). This file contains all the information which are necessary for the identification and the communication with the Master. The information are e.g. vendor ID of the unit, supported transmission rates, dimensions of the exchanged data fields, set-up parameters, available diagnostic messages.



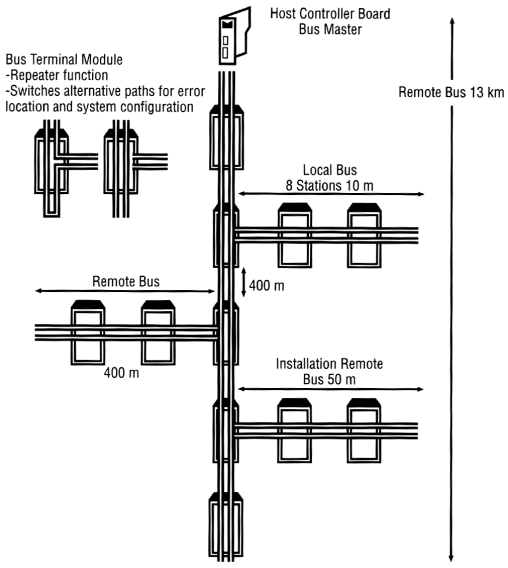
The PROFIBUS-DP network has a tree structure and the main branches are represented by the units and/or sub-networks managed by other Masters.
In order to indentify a unit of the network, users can assign a "DA" address to each unit which is communicated to the Master during it's initialization.

INTERBUS-S

This fieldbus has been worked out as a non proprietary sensor and actuator fieldbus. InterBus-S is a Master-Slave system where communication between the devices is done by means of a single-message containing information for/from all devices (added messages telegram).



In this way a very high efficiency is obtained because the part of the message which doesn't contain information but only data for transmission control is reduced to the minimum.
A network can connect up to 512 devices on a max. length of 400 mt. or up to 13 km by using a signal repeater. The typical transmission rate (baudrate) is 500 Kbit/s.



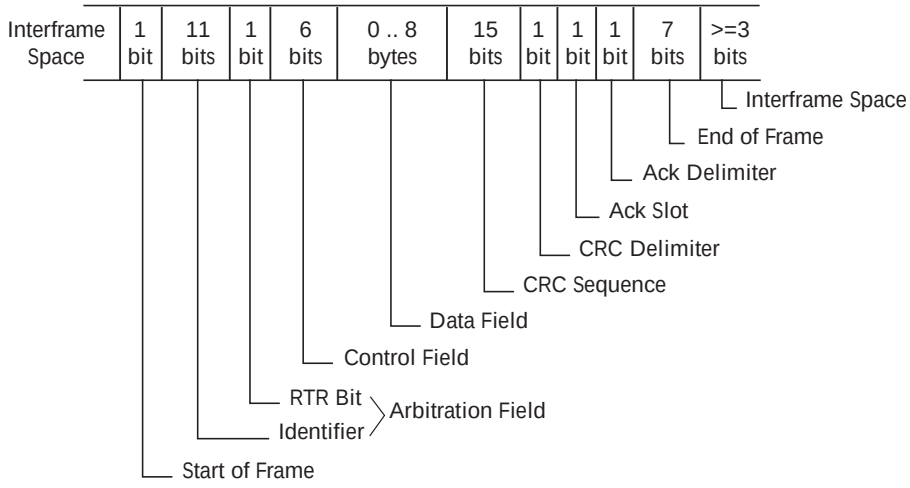
InterBus-S devices are distinguished in 4 different profiles, from 1 to 4. The differences are the length of transmitted data (1 and 2) and the possibility both to receive and to transmit data (3 and 4).
Profibus for example distinguishes only between programmable and not programmable devices (class 2 and 1).

CAN AND DEVICENET

The CAN protocol was originally developed by Bosch and Intel for the automotive industry and is now largely diffused in the industrial automation market as well.
CAN is a multi-master system that allows messages to be delivered to multiple devices simultaneously. An identifier field in the data provides the means for multiple priority levels (used in arbitration), more efficient transfer of I/O data and multiple consumers.
CAN is used as the basis of the DeviceNet standard and defines the base level communications protocol and the hardware. The table shows the relative levels of CAN and DeviceNet protocols. CAN is a basic data link protocol while DeviceNet is an application-level protocol.

DeviceNet Protocol	ISO Application (Layer 7)
CAN Protocol	ISO Data Link (Layer 2)
Physical Layer	ISO Physical (Layer 1)
Transmission Media	ISO Media (Layer 0)

As shown in the diagram, the data contained in each frame can be up to 8 byte long. In case two or more nodes try to access the network simultaneously, CAN uses a unique non-destructive bit-wise arbitration mechanism. This CAN-specific feature allows resolution of collisions without loss of bandwidth or resending of data by the higher priority node.



DeviceNet is a network with up to 64 nodes (CAN max. 32) and a baudrate depending on the networks length of max. 500 kbit/s (CAN max. 1 Mbit/s). The system can be set up as peer-to-peer, master/slave or both. Data is accessible to every component of the system simultaneously in order to provide a very efficient use of the network bandwidth.