INPUT-SIGNAL DELAY

Input-signal delay is a simple pick up delay provided in the majority of input circuits of input modules for binary input signals. Input-signal delays of approximately 5ms are customary.

INSTALLATION BUS

Installation bus systems have been specially designed for the direct connection of binary sensors and, in some cases, also actuators. Such systems cover the component level of sensor-actuator bus systems.

INTERBUS-S

A fieldbus system for sensor-actuator applications. Developed in 1985 by Phoenix Contact, the system has since been standardised (DIN 19 258) or presented for standardisation (Europe/Internationally). The Interbus-S employs a physical ring (hardware) and a sum-frame message (software). Since the sum-frame message is very efficient, the Interbus-S is very fast.

LAN

Local Area Network. A network in a geographically limited area, usually also associated with a single company / system. Fieldbus systems are LANs.

LINE

A line consists of a continuous bus cable to which the stations are connected without interruption in the cable.

LON

A LON (Local Operating Network) is a fieldbus system from the American company ECHELON. In 1990 together with Toshiba and Motorola (second source), Echelon developed the NEURON chip as the basis for this communication system. The neuron chip contains 3 separate 8-bit microprocessors which are programmed using LONTalk, a programming language similar to C. Data from the LON is used in LONTalk like variables that are automatically distributed over the network.

LSB

Least Significant Bit. The bit with the lowest value (usually 1).

MAP

Manufacturing Automation Protocol. MAP is a standard initiated by General Motors for local area networks in the industrial field. The MAP standard is based on the OSI reference model. MAP was originally defined for a broadband system with a transmission rate of 10Mbit/s. The token-bus protocol according in IEEE 802.4 is planned as the bus access protocol.

MASTER

A master is a station that is able to transfer data on the bus directly, i.e. it has bus access on his own. This is in contrast to a slave, which can send data only when requested to do so by a master.

MASTER-SLAVE SYSTEM

In a master-slave system, only one station, the master, has control over the bus. All other stations must constantly scan the bus and may send data on the bus only when requested to do so by the master.

MULTI-MASTER

A multi-master system may consist of two or more masters which are all able directly to access the bus. In any multi-master system, it must be agreed what is to happen if two or more masters access the bus simultaneously. Fieldbuses almost always employ a token-passing protocol or a priority-based access protocol (CSMA/CA). A straight collision-detection protocol (CSMA/CD) might, in extreme cases, completely block the bus and is therefore not used in fieldbus systems.

OPEN SYSTEMS

Open systems allow the formation of multivendor system, i.e. systems that use components from different manufacturers on the same bus.

OPTICAL FIBRE

Optical fibres are data-transmission systems with the highest known degree of immunity to interference. They are usually somewhat more expensive than copper-cable systems. They require slightly more complex cabling techniques and form a ring when used in fieldbus systems.

OSI REFERENCE MODEL

The reference model describes 7 different layers which may all be necessary for serial data transmission. Fieldbuses normally only require layers 7, 2 and 1. The levels are:

- Applications layer, i.e. the interface to the real application
- Presentation layer, i.e. the presentation of data
- Session layer, i.e. the opening of a data transmission session
- Transport layer, i.e. the formation of data blocks
- Network layer, i.e. the finder of the way for a specific data block through the network
- Data-link layer, i.e. bus access and data check (e.g. parity, CRC)
- Physical layer, i.e. the hardware (e.g. RS 485)

P-NET

P-Net is a sensor-actuator bus developed by the Danish company Proces-Data, Silkeborg. P-Net has now been submitted for European standardisation. P-Net employs a multi-master concept with a logical token (no message but time-controlled). The hardware is based on a ring. P-Net allows direct access to a number of segments and, for simplicity of use, provides only very few services.

PARITY BIT

A parity bit is added to the bits of a byte or a block in order to form an even (even parity) or odd (odd parity) number of '1' bits. The receiving station does likewise and then compares the result with the bit it has received.

POLLING

Polling means a cyclic data transmission between a master and his slaves. The master cyclically updates e.g. input and output signals of all slaves, i.e. the master 'polls' the slaves. Polling is not event controlled data transmission.