lamaPLC Communication: InterBus

InterBus is a serial bus system which transmits data between control systems (e.g., PCs, PLCs, VMEbus computers, robot controllers etc.) and spatially distributed I/O modules that are connected to sensors and actuators (e.g., temperature sensors, position switches).

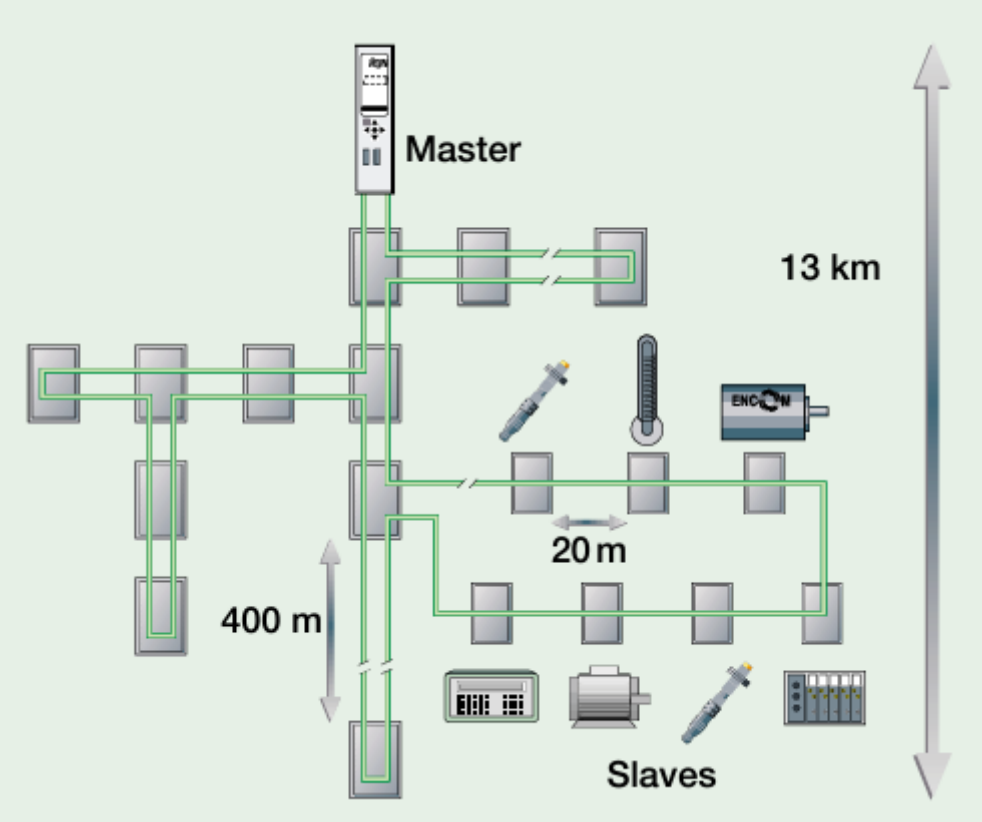
The InterBus system was developed by Phoenix Contact and has been available since 1987. It is one of the leading Fieldbus systems in the automation industry and is fully standardized according to European Standard EN 50254 and IEC 61158.

At the moment, more than 600 manufacturers are involved in the implementation of InterBus technology in control systems and field devices.

Since 2011 the InterBus technology is hosted by the industry association Profibus and Profinet International.

Topology and Structure

In terms of topology, Interbus is a ring system, i.e., all devices are actively integrated in a closed transmission path. Each device amplifies the incoming signal and sends it on, allowing higher transmission rates at longer distances. Unlike other ring systems, the data forward and return lines in the Interbus system are led to all devices via a single cable. This means that the general physical appearance of the system is an “open” tree structure. A main line exits the bus master and can be used to form seamless subnetworks up to 16 levels deep. This means that the bus system can be quickly adapted to changing applications. Topology Flexibility The Interbus master/slave system enables the connection of up to 512 devices, across 16 levels of networks. The ring is automatically closed by the last device.

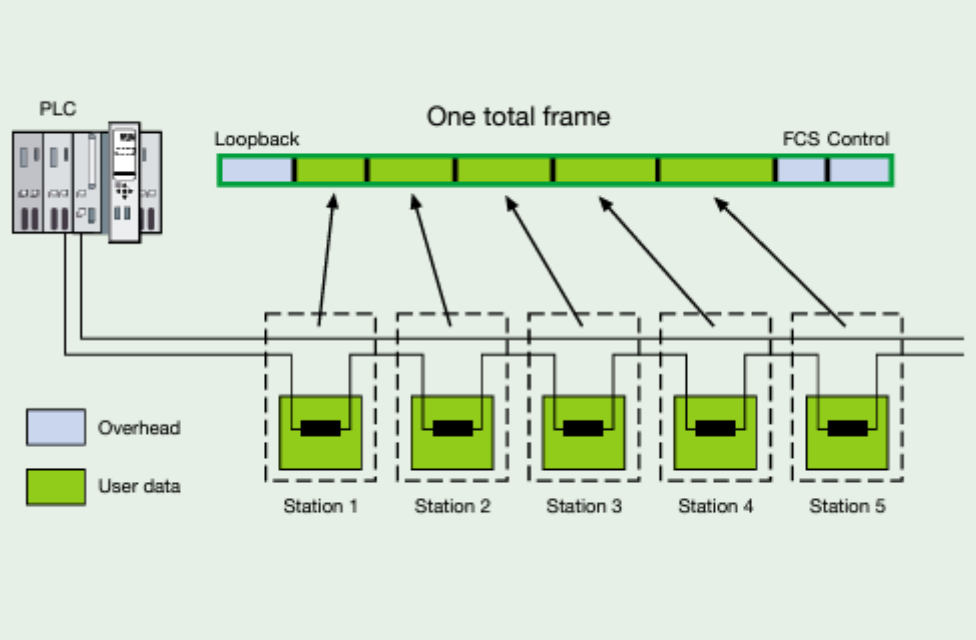


Data Transmission

Interbus is the only bus system working according to the summation frame method that uses only one protocol frame for messages from all the devices. In this master/slave access method, the bus master acts as the coupling to the higher-level control or bus system. The method provides a high level of efficiency during data transmission and enables data to be sent and received simultaneously (full duplex operation). With this data transmission method, Interbus ensures constant and predictable sampling intervals for setpoints and real time control values. In summation frames, which consist of the header, the loop-back word, and data save and end information, data from all the connected I/O devices is grouped together in a block.

The additional information that is required is transmitted only once per cycle. In practice, this method can be described as a register, which is formed by the devices that are connected in a ring system. In Interbus this consists of a number of binary memory cells, which push digital information from cell to cell to clock pulses. Each device has a certain number of buffers assigned to a preset number of cells for different tasks, e.g., data input and output for the process. Additional registers monitor the data transmission for errors.

An Interbus device contains three registers that are connected in parallel. I/O data is transferred using the data register. The type of Interbus device is defined in the identification register. This enables the bus master to identify the devices and the bus topology, as well as to carry out addressing. Data is saved using the CRC16 register (cyclic redundancy check), where correct data transmission is checked.



Sources

Wikipedia (here)
InterbusClub.com: Interbus PDF

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