Safe power line transmission system using the existing wiring

Busch-Powernet® EIB
The new Busch-Powernet® EIB opens up a whole new range of application options for the Busch-Installationsbus® EIB. Wherever, in an existing wiring system, the installation of a separate new bus cable is not feasible, for whatever reason, using the existing 230/400 V mains wiring presents a whole new outlook. Retrofitting then even becomes possible without interrupting daily business: the overriding advantage for such buildings as private dwellings, hotels, educational establishments or public buildings.

Busch-Powernet® EIB will generate a wave of interest for retrofitting EIB technology in private dwellings. Here, as in many other existing buildings, retrofitting of wiring is no easy task. The Busch-Powernet® EIB makes modern, convenient, versatile installation in existing buildings a reality.
Busch-Powernet® EIB.
Completely innovative transmission technology.

Transmission technique: Spread Frequency Shift Keying (SFSK)

Transmission rate: 130 milliseconds.
That’s fast.
To guarantee safe data transmission via the powerline, a completely new transmission procedure has been developed for Busch-Powernet® EIB, guaranteeing a high degree of reliability under all typical powerline conditions. This transmission system is called SFSK - Spread Frequency Shift Keying.

The outstanding feature of this system is that the signals are transmitted using two separate frequencies. Pattern recognition technology and a sophisticated error correction method allow each signal received to be “repaired” at the receiver side, even in the presence of noise interference. If a data “telegram” is error-free, the receiver sends an acknowledge signal to the transmitter. This indicates the end of the transmission procedure. If the transmitter receives no answer, the transmission is repeated. Despite all the safety precautions, this procedure only takes approx. 130 ms. This leads to a message rate of seven per second. The transmission rate is around 1200 bit/s (baud). Busch-Powernet EIB can use 2 frequency bands for transmission in the range approved by CENELEC.

- Band A: 105.6 kHz / 115.2 kHz
- The transmission level is 116 dBµV.

The only restriction is that a maximum of 32,768 devices can be used per project, corresponding to the same number of household appliances.

Alongside the topographic limits, the following physical restrictions apply in practice:
- No operation across a transformer station.
- No operation on power lines with deviating power line parameters or tolerances (e.g. 110 V / 60 Hz).
- No operation on power lines using incorrectly suppressed devices.

Planning stage: With or without signal coupler / repeater

Normally, no additional planning guidelines need to be observed for Busch-Powernet® EIB installations, except the fitting of a filter. The main restriction is that the length of the cable between two corresponding bus participants should not exceed 500 m. If this distance is to be exceeded, a signal coupler / repeater will be required. The telegram structure of the Busch-Powernet® EIB changes when using the signal coupler / repeater. For this reason the existence of a signal coupler / repeater must be “registered” before starting programming.

Programming with ETS 2: all at the press of a button
To make full use of all the Busch-Powernet® EIB components, all units can be projected and programmed with the EIBA tool software (ETS 2) version 1.1 or higher. This programming is practical and easy to use.

Each Busch-Powernet® EIB unit is equipped with a programming button which should be activated when programming for the first time. The program LED confirms that the correct sequence has been adhered to. It is not necessary to reprogram a Busch-Powernet® EIB device when making subsequent changes.
Apart from being cost effective, this system is ideal for heavy-duty everyday use in schools, public buildings and industry and for added convenience in private dwellings.

**Powernet® - mains coupling** forms a physical and electrical link as well as the communications highway to an electrical installation.

**Sensors** provide information, such as switch and dim commands or physical readings in telegram form via the Powernet® EIB information network to the receiver units (actuators).

**Actuators** receive the telegrams sent by the sensors and convert the commands received into actions (e.g. switch, dim or display).

**Interfaces**

Depending on the version, interfaces provide the link to superordinate Busch-Powernet® EIB layers or to Busch-Installationsbus® EIB or the ISDN network.
Busch-Powernet® EIB.
Gets House Management lined up.

Structure
Up to 32,768 devices can be used in one Busch-Powernet® EIB project. It is not necessary to allocate these to lines and layers using couplers, as all Busch-Powernet® EIB devices are connected to one another via the existing mains wiring and have equal status.

Although not a necessity, it is advisable to subdivide complex Busch-Powernet® EIB projects. Up to 16 lines each containing a maximum of 256 devices in up to 8 areas can be defined, to ensure a logical structure.

To avoid overshooting and crosstalk with neighbouring Busch-Powernet® EIB projects, filters are installed and additional system ID's are sent with the data telegram.
Bus management: intelligent communication

Bus management has a decentralised structure. Important messages are treated with increased priority and processed first. Priorities, participant addresses and functions are entered via the PC or controller. The connection to other Busch-Powernet® EIB areas or even to other bus systems is achieved via interfaces. A special ISDN interface enables communication with the installation from any telephone or transfer of alarm messages.
Member of the
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