

# Eljo Installationbus-EIB

The Eljo Installationbus consists of a two-wire bus cable and connected bus-adapted installation units, such as sensors, electrical units, and system components. Eljo Installationbus units are certified by EIBA according to European Installation Bus (EIB) standards.

Sensors convert information and send it out on the bus cable in the form of "data telegrams". Sensors could include rocker switches and binary inlets for the connection of potential free contacts.

The electrical units receive data telegrams and convert these to connection and dimmer signals. Examples of electrical units are breakers, dimmers, and analogue outlets.

System-units and components are needed to operate the system. These are primarily current supply for generating bus voltage, connectors for bus sections, and interfaces for connecting programme-units.

The bus' two-wire cable carries both information and electricity for the bus unit's electronics. The bus cable is connected to each bus-unit.

## System information

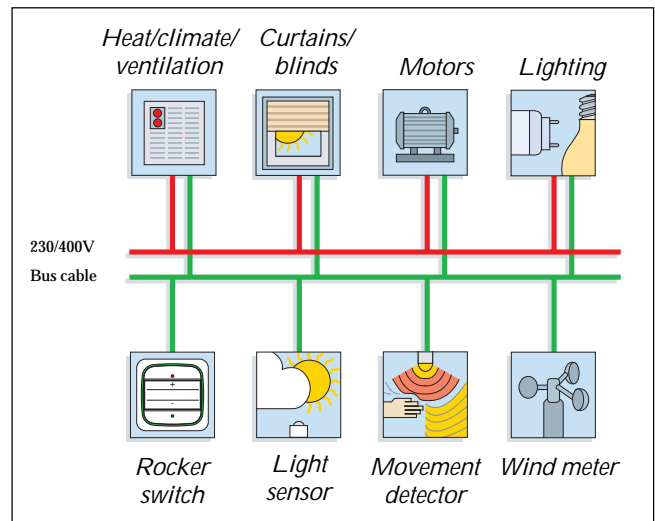
Task-specific sensors and units are selected and consist of bus connectors and application modules with corresponding application programs.

The application programs are part of Eljo's product database and are loaded with projection and operational start-up software ETS from the serial interface in a PC down via the bus and into the participants. Eljo's product database can be obtained free of charge on request.

The Eljo Installationbus is a decentralised bus system. Each unit has its own micro-controls. The units can communicate directly via the bus, without a central unit. All units are equal bus participants (multi-master operation).

The CSMA/CA method is used to avoid telegram collisions and data destruction.

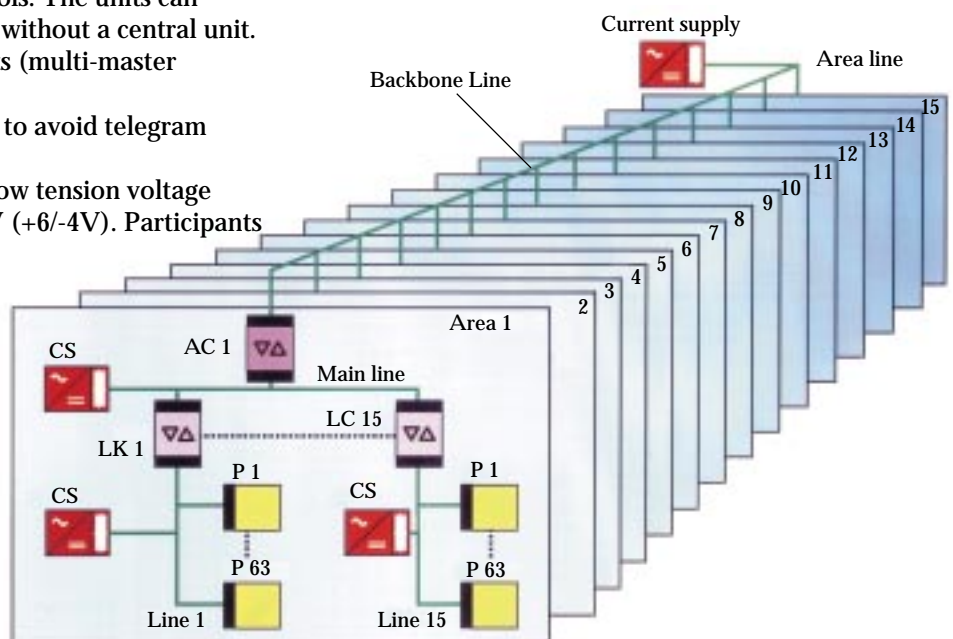
The Eljo Installationbus runs on low tension voltage SELV. The bus voltage is DC 24V (+6/-4V). Participants using under 20V are disconnected from the bus. Data transfer takes place at a speed of 9.6 kbit/s.



## Topology

The Eljo Installationbus is divided into sections with a hierarchical structure. The smallest unit is the line. A line contains a maximum of 64 bus participants (D) and a current supply with outlet. (SF). Through line couplers (LC), which are connected together via a main line, up to 15 lines can be connected. These form an area. In larger installations, up to 15 areas be connected via an area couplers (AC). The main lines and area lines require their own power supply with outlet.

More than 14,400 bus participants can be connected to the Eljo Installationbus if all lines and areas are put into use.



AC: Area coupler  
LC: Line coupler  
P: Participants  
CF: Current supply

# Connection of units

The bus installation units consist of:

1. Bus connectors
2. Application modules
3. Application programs

Information which is to be processed reaches the bus connector via the bus. This sends and receives data, ensures the supply of power to the electronics, and stores important data, e.g. its own physical address. The bus connector also stores the application program with its own parameters and group addresses. The application module and application program define the bus participant's function. The application program and application module must be tuned to each other. The functioning of a unit is guaranteed only on condition that the bus connector, application module, and application program originate from Eljo.

### Units in Trend design

These units are supplied complete and consist of inset (application module and bus connector integrated into

a unit), supporting frame, 1-compartment Trend frame, and bus connection clamps (exception: room thermostat PI flush where the application module and flush mounted bus connector are ordered separately). The supporting frame is screwed onto a mounting box or surface box and the inset and Trend frame are then snapped onto the supporting frame.

### Units in Decora design

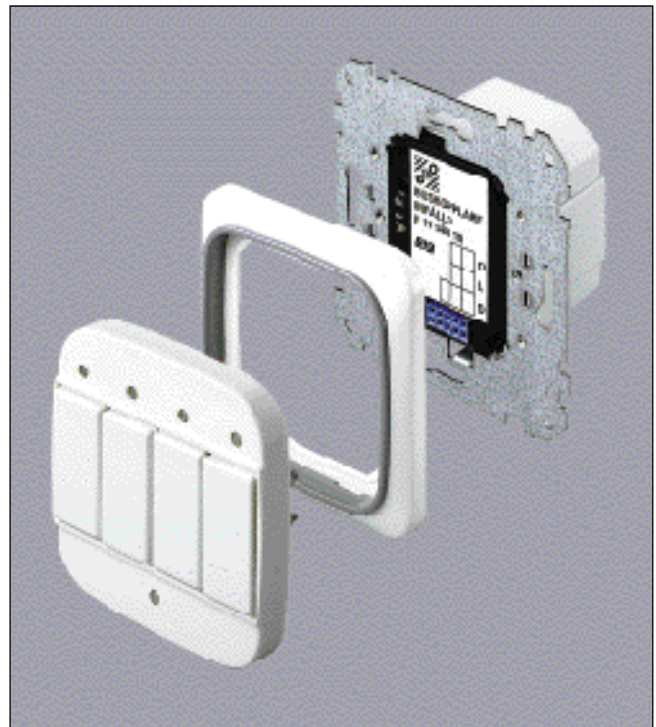
The application module and bus connector are of stick-in design. The application module, flush bus connector, and Decora frame are ordered separately. The bus connector is fitted into the mounting box or surface box and the application module and Decora frame are then pressed on over the bus connector.

### Units in flush (not design products), surface and built-in designs

The units have integrated design with bus connector and application module in a single casing. The bus connection is supplied with bus connecting clamp.



*Eljo Installation bus - EIB in Trend design*



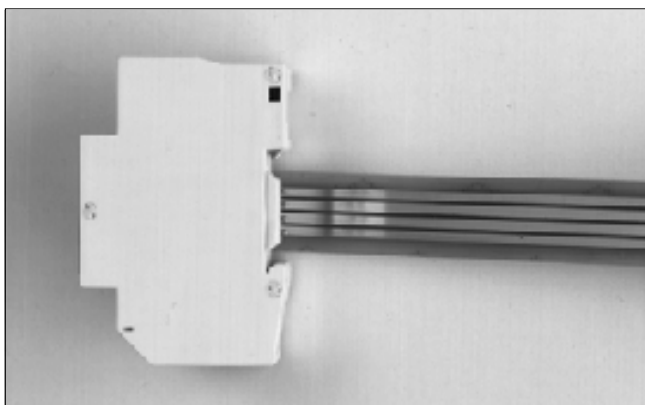
*Eljo Installation bus - EIB in Decora design*

Units for DIN rail

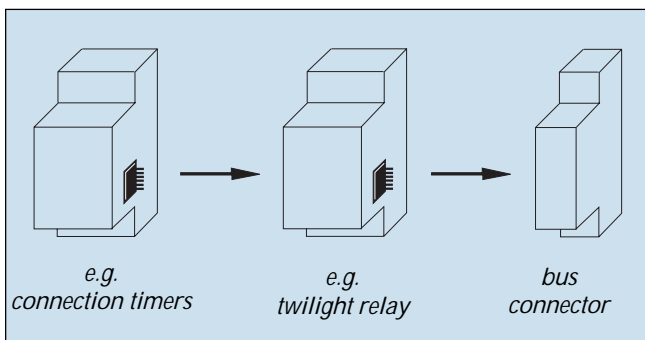
**DIN-K:** Integrated design with application module and bus connector in a single casing. Fitted to DIN rail EN50022-35 (various heights). The bus connection made with a bus connection clamp (included). No data rail is required.



**DIN:** Integrated design with application module and bus connector in a single casing (exception: bus connector DIN). Fitted on DIN rail EN50022-37x7.5. The bus connection made via a spring contact pin on the underside of the unit to a data rail glued into the DIN rail.

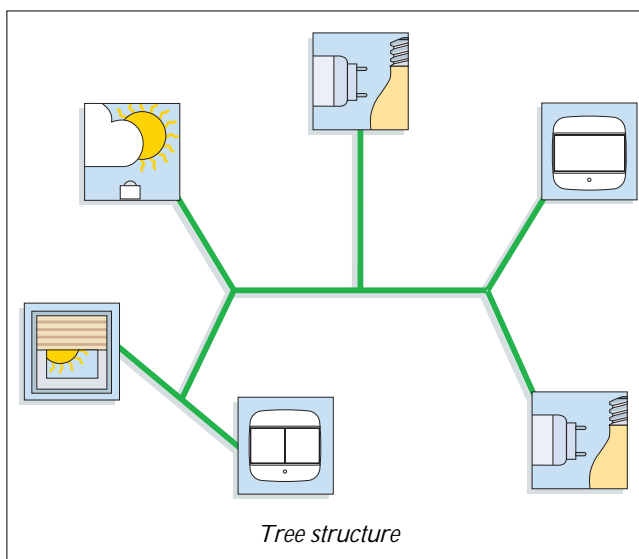
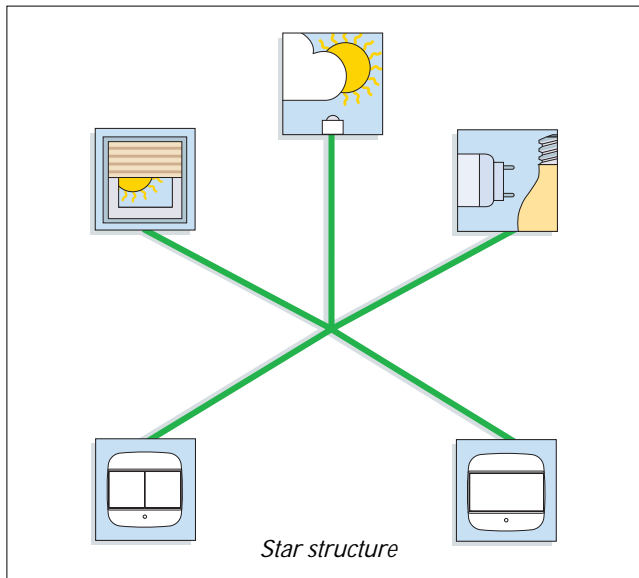
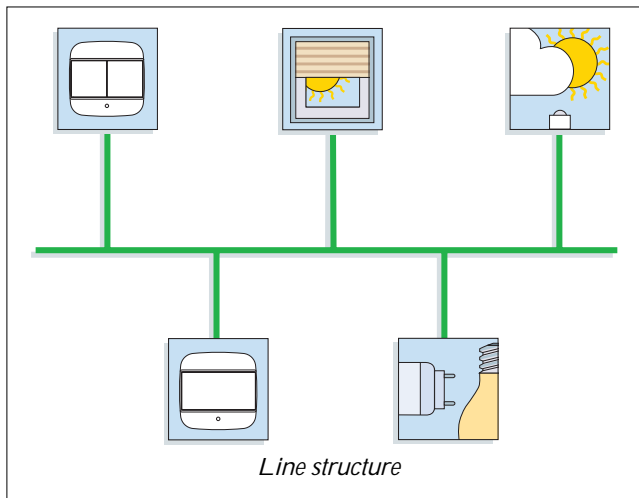


**DIN-S:** Application module and DIN bus connector have a stick-in design and are ordered separately. The application module is pressed on from the left of the DIN bus connector or other DIN-S unit. A maximum of four channels can be connected to a DIN bus connector. Fitted on DIN rail EN50022-35x7.5 and bus connection takes place via bus connector's spring contact pin to data rail.



Wiring

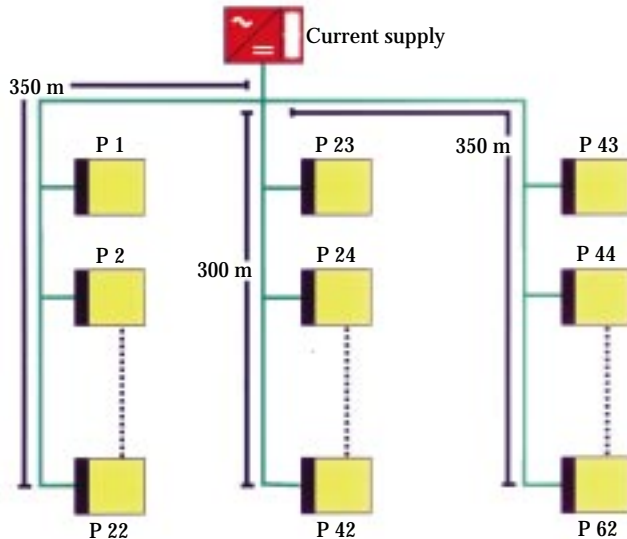
Wiring can be carried out with a line, star, or tree structure or in any combination of these structures.



## Wiring length

When installing bus wiring, the following values must be observed:

- Max wiring length between voltage supply and bus participants: 350m
- Max wiring length between two bus participants: 700m
- Total length of wiring in one line: 1000m



### Wiring specifications:

The following types of wiring can be used as bus wiring:

Type	Construction	Placing
<b>YCYM</b> <b>2 x 2 x 0,8</b>	EIBA guideline (Base: DIN VDE 0207 and 0815) Wire red (+EIB) black (-EIB) yellow (reserve) white(reserve)	<b>Fixed installation:</b> In dry, damp, and wet spaces, surface, flush, and in pipes. Outdoors, if protected from direct sunlight.
<b>J-Y (St)</b> <b>Y 2 x 2 x 0,8</b> in EIB-design*	DIN VDE 0815 (Base: DIN VDE 0915) Wire red (+EIB) black (-EIB) yellow (reserve) white(reserve)	<b>Fixed installation</b> In dry and damp operational spaces, surface, flush, and in pipes. Outdoors, flush.

\* The DIN VDE 0829 standard specifies 4 kV as the value for test-voltage for a further test between wiring and external surface areas according to DIN VDE 0472 part 508. It can be expected that this value will be changed to 2.5 kV within the framework for European harmonisation.

If the bus wiring's second, yellow-white (reserve) wire pair is used, the following points should be noted:

- Only SELV low voltage is permitted.
- Max. permitted permanent current 2.5A (short-circuit and overload protection required).
- Speech transference is permitted, but not as telephone wire in public telephone network.
- There must be no erroneous exchanging in the wiring used.

## Summary of system data

Transfer medium:	Twisted pair cable
Functions:	Connection, control, regulating, display, measuring, indicator, monitoring
No. of participants in one line:	64
No. of lines per area:	max. 15 + 1 main line
Number of areas:	max. 15
Bus wiring:	Standard telecommunication circuit, J-Y (ST) 2x2x0.8, and/or MSR-wiring, YCYM 2x2x0.8. One wire pair for signal transfer and voltage supply. One wire pair as reserve
Length of wire per line:	max. 1000 m
Distance participant-voltage supply:	max. 350 m
Wiring structure:	Line, star or tree structure, or combinations thereof
Addressing:	Individual units or functions
Bus management:	Multi-master operation, i.e. each participant is equal, no central unit. Decentralised accessibility, CSMA/CA principle (collision detection and resolution without loss of telegram)
Transfer technology:	Serial telegram transfer, baseband, Twisted pair technology, symmetric transfer
Transfer speed:	9.6 kbits/s
Feed voltage:	DC 24V (+6/-4 V), short-circuit protection, low voltage protection (SELV), 100 ms buffered
Operating temperature:	-5°C to +45°C
Disturbance (EMV)	Standards and guidelines according to IEC and VDE

## Addressing

For EIB addressing, a distinction is made between the physical address and the group address. The **physical address** is the equivalent of the bus participant's name and is given as "Area. Line. Participant" (e.g. 5.4.23). **The group address** establishes the identity of the bus participants. With the exception of servicing and programming measures, a participant is always called up via its group address/es. The group address is divided into up to 15 main groups, each with a maximum of 2048 sub-groups. This is denoted by the structure "Main group/Sub-group" (e.g. 1/127).