

LABCONTROL – ANALOGUE

The analogue communications system with 0-10 V DC or 2-10 V DC signals

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For measurement value and signal transmission between components of control system, TROX uses the common 0 - 10 V analogue communications system in widespread use of building automation and the field bus sector.

The systems between which a measurement variable is to be transmitted must be connected electrically via a direct line with two wires. Each line connection is for the transmission of exactly one measurement variable from one system to the other.

The measurements are transmitted via this line connection in the form of varying DC voltages (DC) in the range of 0 - 10 volts.

Many areas of analogue communication limit the voltage range for valid measurement values to 2 - 10 V DC to enable the recognition of faults in the line connection (e.g. cable breakage).

Thus, a faulty connection can be identified on the basis of a missing signal voltage of at least 2 volts.

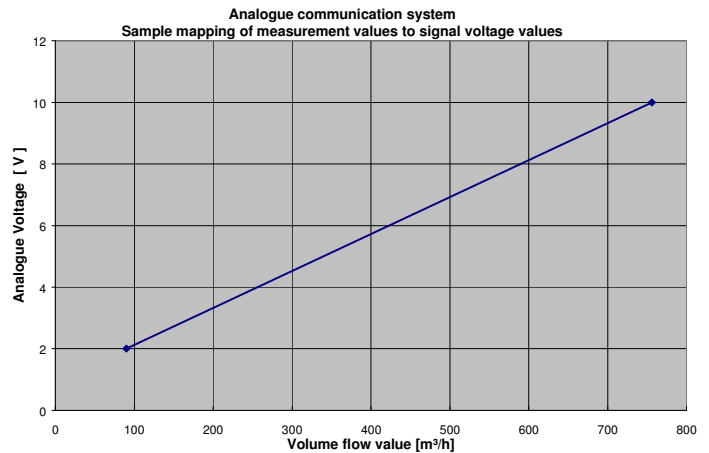
To ensure that both systems speak the same language regarding the value transmission, the value range of the transmitted variable is assigned to a certain voltage range when the system is commissioned.

The minimum and maximum measured values that will be transmitted are mapped onto minimum and maximum DC voltage values.

For example, the transmission of volume flows could be configured as follows:

Measurement value range	Actual volume flow value	Voltage signal
Minimum value to be transmitted	90 m ³ /h	2 V DC
Maximum value to be transmitted	756 m ³ /h	10 V DC

Further measurements are assigned to voltage signals within the fixed range by using intermediate values calculated on a linear scale. For clarity, this relationship is shown in the following illustration.



Advantages of analogue communications systems:

- Unambiguous assignment of the signal transmission path between two system components through a direct electrical line connection. The analogue output of the transmitting system is connected to the analogue input of the receiving system.
- Simple means of checking the transmitted measurement by measuring the associated analogue voltage with a multimeter.
- Simple means of detecting a faulty line connection (cable break) through missing measurement signal.

Disadvantages of analogue communications system:

When many different measurement values are transmitted or if many different system components need to communicate, the effort that goes into wiring in an analogue communications system increases dramatically.

As of a certain project size, it is therefore preferable to use a field bus system such as LON for communication. A field bus system electrically connects all system components with each other once via a two-wire line (LON) and with the aid of a communications protocol makes it possible to exchange a wide variety of messages via this medium. These messages can contain measurements, types of operation, or alarm or fault messages.