DANFOSS
A84B1290.10

Interface for DANBUSS
Data communication system

What is DANBUSS

Danfoss has developed a complete DANBUSS data communication system which is based on the well-known standards.

Danfoss would like to spread the knowledge of this data communication system and offer it for use in other units than Danfoss' own. This brochure contains a description of the basic principles of the system.
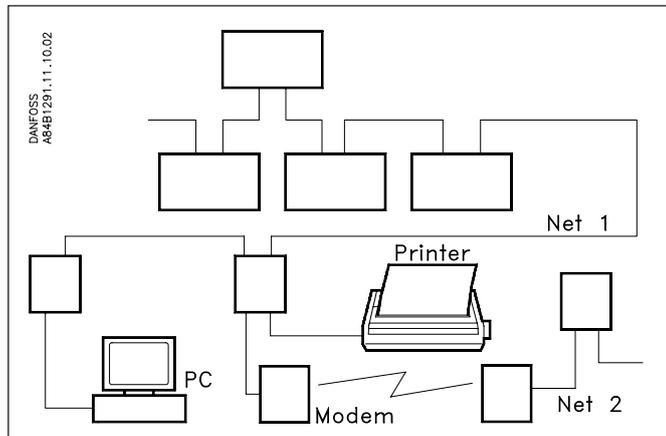
The DANBUSS data communication system is a connecting link between a number of independent units, so that information can be exchanged between them.
Typical information includes:
- settings in a unit
- sundry measured data
- error alarm messages
- control of operation

In principle this exchange of information can take place because each unit has its own built-in electronic components and software. These built-in electronic components and software will then transform the unit's own data into a data signal that can be transmitted through a two-core cable.

Who is the boss?
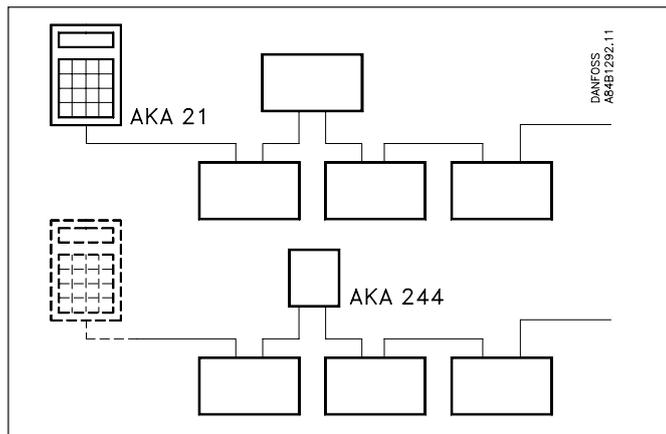
In a communication system it is important that law and order is maintained, so that information will not be sent around in wild confusion. This is achieved by assigning one of the units the role of master. It will now be the master's role to allot the various units "time to speak", one by one, so that: information can be transmitted and received - acknowledgements of receipt can be sent - receipts can be received - after which the "time to speak" is concluded. This leading role can be assigned to two unit types: control module type AKA 21 which is normally used for small systems. This module will here automatically take on the role as master. In larger systems a gateway type AKA 244 should be mounted. This gateway will then assume the role as master.

With whom can the system communicate?
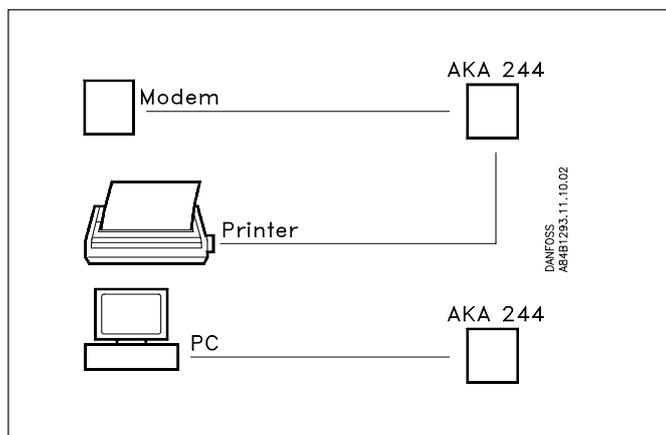
DANBUSS is a communication system in itself and will continue the general communication, even if a unit in the network drops out.
In addition to the normal commmunication, the system can also communicate via the telephone network (modems), send alarms to a printer or be connected to a PC.

When such connections are made, the data signals have to pass through a gateway type AKA 244. In this gateway the signals are converted, so that the different systems can understand each other. DANBUSS can for instance understand the modem system, and vice versa, and DANBUSS can understand the PC system, and vice versa.

How are other controllers and systems connected to DANBUSS
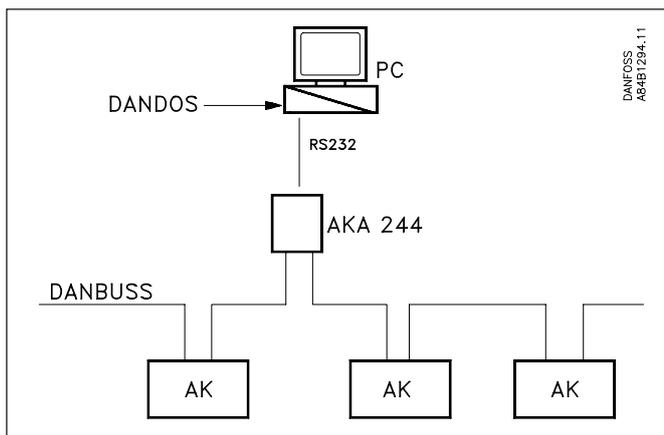
A system is shown here where communication is required between a PC programme and DANBUSS.

To establish contact between the PC programme and an RS232 input on DANBUSS, the interface between the two systems is entered in the PC's software.

This interface may consist of a software component called DANDOS. This software is installed in the PC's operating system, DOS, and a software part will then have to be developed that can communicate with DANDOS. The development will be based on the data contained in DANDOS and DANBUSS.
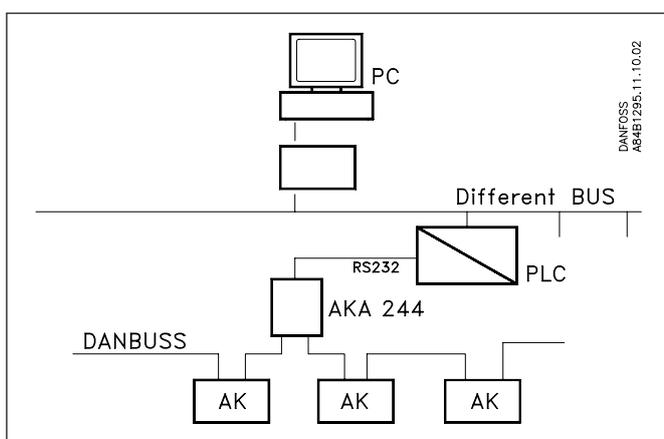
A system is shown here where there is communication between two bus systems ("Another BUS" and DANBUSS).

Here the interface between the two systems must be entered in, say, the software of a PLC.

The interface must be developed separately and be based on the data contained in DANBUSS. The nature of the interface will depend on PLC type and make.
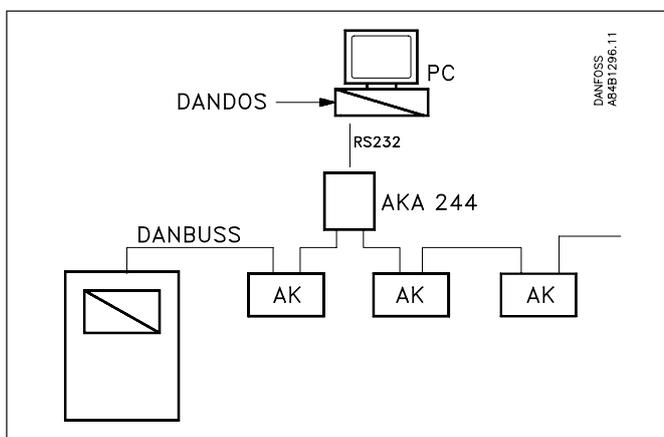
A system is shown here where there is communication between a PC programme and DANBUSS as well as communication between DANBUSS and another controller which is not a Danfoss controller.

Two interfaces have to be entered here. One in the PC's software and another in the controller (hardware and software).
The interfaces may consist of a software part called DANDOS and a hardware and software part in the relevant controller(s).
DANDOS software is installed in the PC's operating system, DOS. The interface in the controller consists of a developed hardware and software part. The development is based on the data contained in DANDOS and DANBUSS.

Advantages in also using DANBUSS

- **One communication bus only**
  With this you achieve that:
  - installation costs are reduced to a minimum
  - the daily operation can be carried out from one PC programme
  - collection of data and alarm control are simplified

- **Well-defined interface for exchange of data**

- **Large components programme that has been "developed" for DANBUSS**

- **Protection of the communication can be arranged with a ring connection (protection in case of a cable breakdown)**

- **Communication bus with both LAN and WAN**

General technical information

Structure	ISO's OSI model (Open Systems Interconnection)	Number of networks	256
Interface	RS485 (Interface can be established with RS232, e.g. PC and modem via gateway)	Power supply	5 Vd.c. (external connections only)
		Cable ends	To be provided with resistors
Topology (wiring)	Bus. Two-core conductors, twisted in pairs	Addressing	In Danfoss AKC controllers via dip switch
System layout	LAN and WAN (single network/ several networks)	Synchronisation	Asynchronous transmission
		Bus access	Token allotment from master with cyclic access
Protection against cable breakdowns	A ring buffer module can be installed	Access time	35 ms / unit (not load)
Transmission reliability	99,998%	Communication control	Alarm is sounded for newly entered addresses and for lost addresses
Amplifier required	- When cable lengths exceed 1200 m - For each 25 connected addresses - When galvanic isolation has to be performed	Speed	4800 baud
		Datagram size	127 bytes. Max. message = 115 bytes
Number of units per network	124	Communication form	Master to slave, slave to master and slave to slave

List of literature

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                    This brochure
                  DANDOS literature
        DANBUSS          |    AKA 244
  Installation Instructions |   Manual
   Document on hardware with technical description
                   "Contract"
Technical document | DANDOS software | Software documentation | List of parameters AKC
on software        |                 | 8-10 documents         | controllers
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