

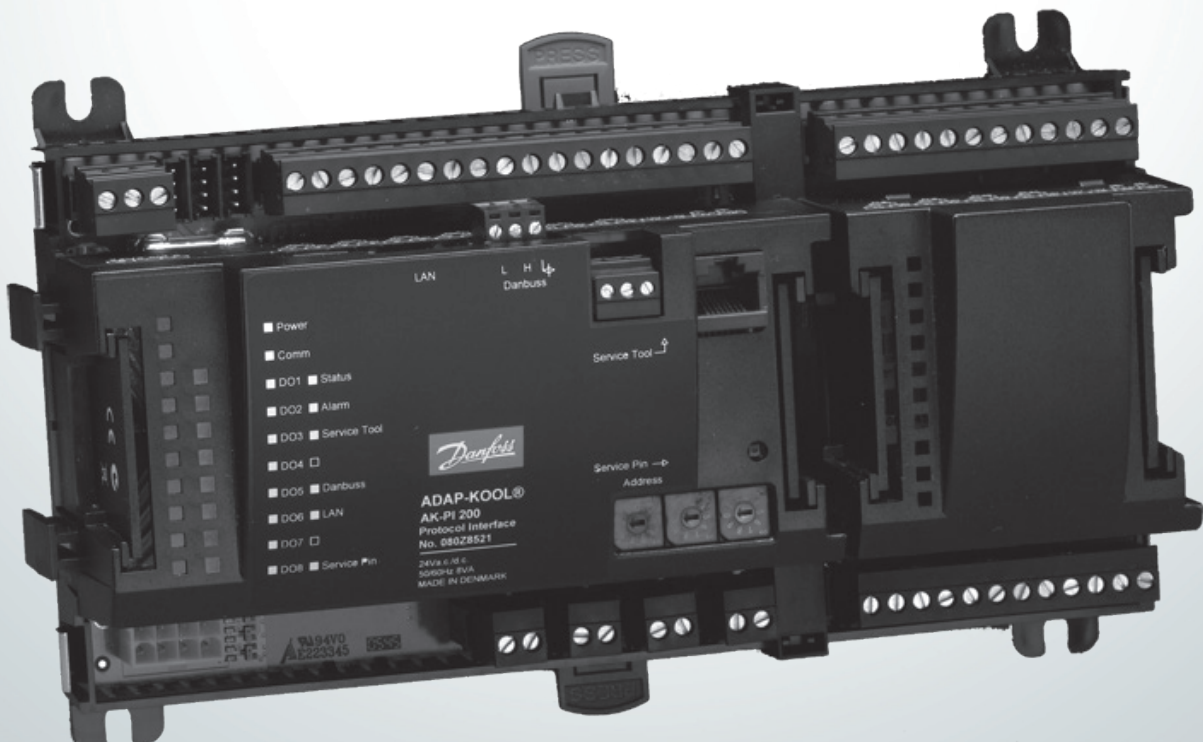
ENGINEERING
TOMORROW

Danfoss

User Guide

Protocol interface AK-PI 200

ADAP-KOOL® Refrigeration control systems



ЮГОВ - Проект

інженерно-виробниче підприємство

Офіційний дистриб'ютор
Danfoss в Україні



ugov.ua

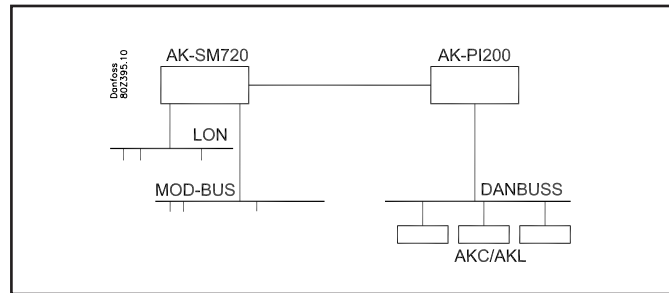
Introduction

Function

The AK-PI 200 is an intermediary link allowing AKC and AKL type controllers to be operated via a system manager, e.g. AK-SM 720. The actual operation of the controllers is carried out with an AK-ST 500.

(AKC and AKL controllers use the DANBUSS data communication system. The communication is controlled by a gateway, e.g. AKA 245.

In a solution with an AK-PI 200 and a system manager, the gateway should not be used.)



Application

The AK-PI 200 is used on systems where the system unit is an AK-SM 720 and where there are one or more controllers with DANBUSS data communication.

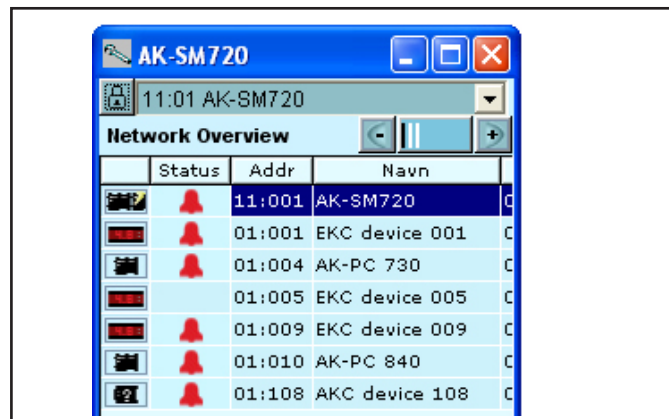
The unit links the communication to DANBUSS so that the system manager can present all the controllers on the system.

DANBUSS controllers are presented on an equal footing together with LON RS 485 controllers and MODBUS controllers.

All controllers can be viewed and operated from the system manager's network overview.

The solution can be used on existing systems where the majority are DANBUSS controllers and where it would be desirable to change the system operation to a browser-based interface instead of an AKM software interface.

Or it can be used on new systems where the majority might be controllers with LON communication and other individual controls can be AKC controllers.



Principle

The link between the system manager and the AK-PI 200 is via a TCP/IP.

In this very simple connection the two units can be connected to each other via a crossed cable.

This is where the IP addresses are set to static addresses.

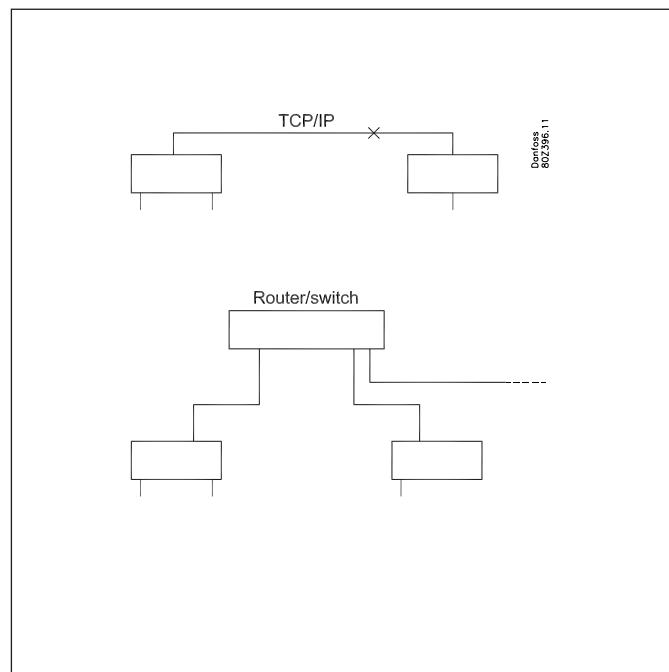
On larger systems or where there is also outgoing IP communication from the system, the connection must be made via a router.

Here the IP addresses can be dynamic, but if there is communication to the system from outside, they must be static.

If you are not sure whether you should select static or dynamic, abide by the following recommendation:

Dynamic is the easiest. Here the router itself allocates an address for the system manager and another for the PI unit. But you should only select this solution if the system is closed without a connection for an external operation interface.

With static you must obtain a couple of addresses yourself at the local IT department and you must also set the addresses yourself in the two units. This solution must always be used when the system is operated by an external service company, e.g. for log collection, alarm management or service.



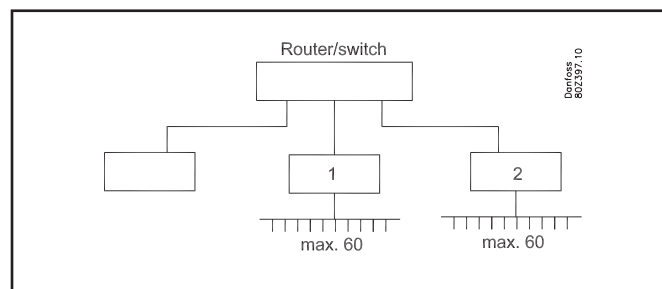
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Number of controllers

Up to 60 controllers can be connected to a single AK-PI 200. If there are more than 60 controllers, two AK-PI 200 units should be used.

Up to two AK-PI 200 units can be connected to a single system manager, in other words up to 120 controllers on the DANBUSS communication. If there are two AK-PI 200 units, the connection to the system manager is led via a router or a switch.



Addresses

In principle there are three types of addresses:

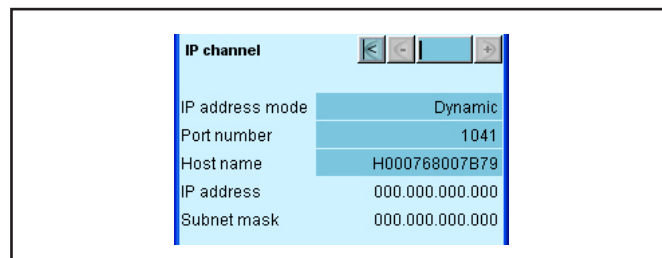
IP addresses

Both the system manager and the AK-PI 200 must have an IP address set.

The address can be either dynamic or static – the desired value is selected with a setting. If static is chosen, an address must also be set.

If the system can be accessed externally, the setting in the system manager AK-SM 720 must always be set to static so that the external connection always recognises the address and can communicate with the unit.

(The IP address is set in a menu).



Network addresses

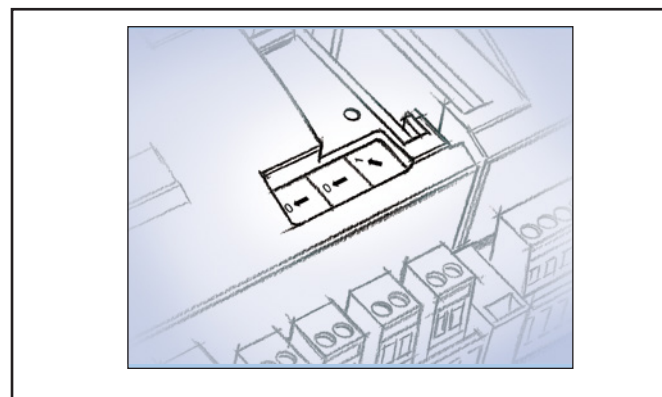
There must always be one and only one master system manager on a network. This is defined with the address setting = 1. This system manager controls the communication to all the other controllers on the network. The PI unit is perceived as a controller on the network and its address can be viewed in the IP list. (Up to two PI units can be connected to the system manager, which is master - i.e. has address =1)

(You set the network address on the front of the system units and on the front of the PI units.)

Set the system manager to address 1.

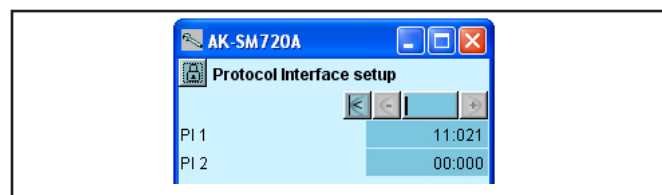
If there are several system managers (slave network), set these to addresses 2 to 10.

Each PI unit is set with a separate address. Select 12 or higher, e.g. 21.



Interconnection

When setting the system manager, a menu must also be set in which the relevant AK-PI 200 chooses the network. The system manager then knows the way to the different DANBUSS controllers. The system manager must be version 1.20 or later.



Controller addresses

All controllers on the same network must have different addresses. In other words, all controllers that are connected to a system manager on either:

- the LON communication
- the MODBUS communication or
- the DANBUSS communication.

Start with the addresses on DANBUSS. They must be set with a DIP switch and cannot be set to higher than 120.

The addresses on the LON and MOD buses can be set higher. No more than 200 controllers can be connected to a system manager.

DANBUSS communication:	Address options 1 to 120
LON communication:	Address options 1 to 999
MODBUS communication:	Address options 1 to 247
Max. number of controllers: 200	

Installation

Preparing controllers on DANBUSS

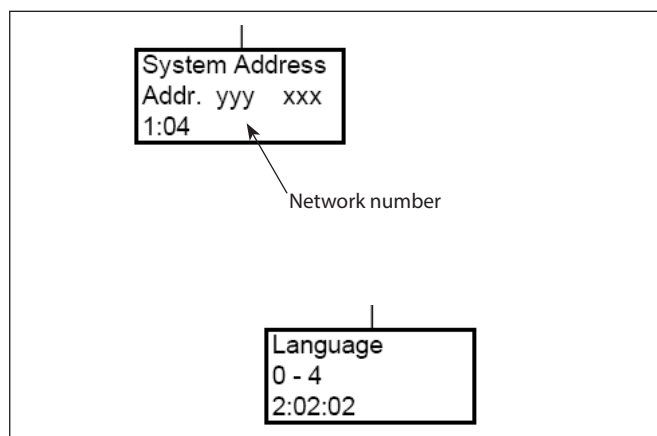
In an existing system

If it is an existing system in which the controllers have previously been connected to a gateway, the pairing (network number) with the gateway is registered so it can be set in AK-PI 200.

1. Register the network number for the later setting.

In a new system

1. Set the address of the controller
2. Switch it on if it is not already on
3. Set the desired language in the controller (connect the AKA 21 and set the language selection menu. Disconnect the AKA 21 after entering settings).



Preparing TCP/IP connection

The AK-PI 200 must have a connection to the system manager – both physically and with a software setting. This can take place in one of the following ways:

1. Connection

- a) Direct connection (only used if there is not an external connection via a router).

The cable between the two units must be a crossed cable. (A static IP address is always used here.)

- b) Cables from the units are connected to a router or to a switch. (A dynamic or static IP address is used here.)

2. Setting

a) Router

- Dynamic: There are no settings in the router
- Static: A static address range must be set in the router

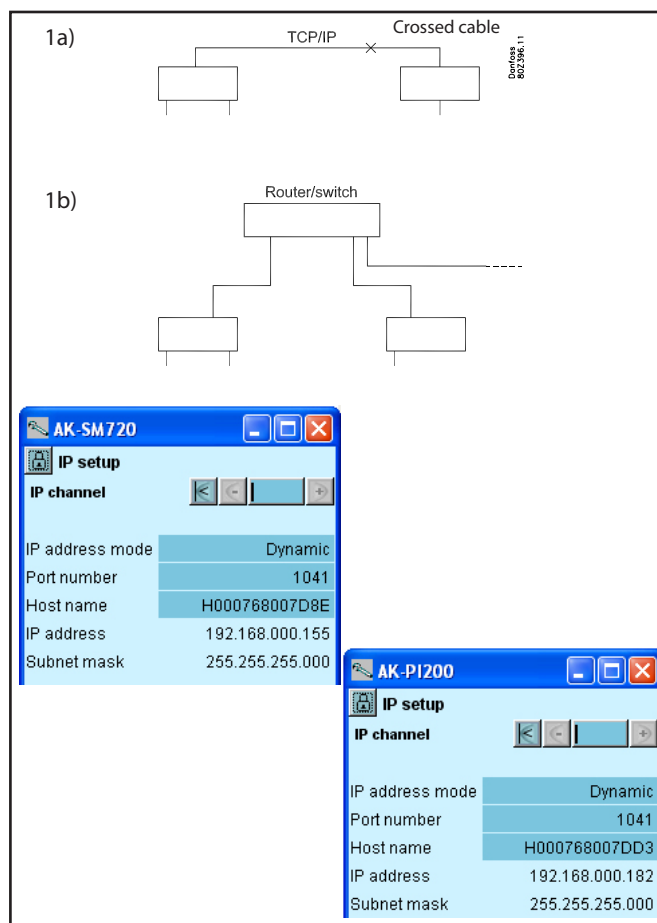
b) AK-SM 720

- Select static if the connection between the system unit and the AK-PI 200 is with a crossed cable or there is an external connection to the system. Then set the IP address (an IP address must be obtained from the local IT manager).
- Select dynamic if it is a closed system and the two units are connected to a router or a switch.

c) In the AK-PI 200 the IP address is set either to static or to dynamic.

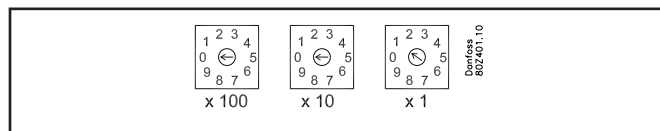
- Select static if the connection between the system unit and the AK-PI 200 is with a crossed cable. Then set the IP address (an IP address must be obtained from the local IT manager).
- Select dynamic if it is a closed system and the two units are connected to a router or a switch.

3. If a router or switch is connected, it must be turned on.



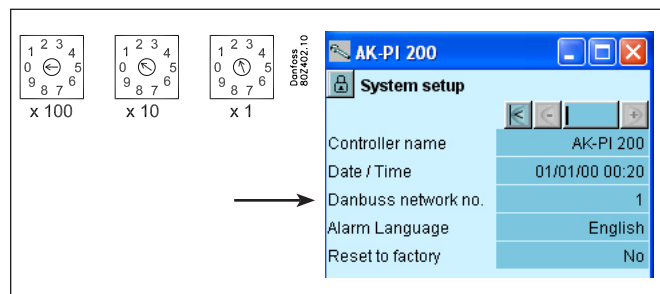
Preparing the system manager

1. Set its address on the front to 1 (there must always be a system manager with address 1 on a network (1=master)). If there are several networks and thus several system managers, they must have addresses 2 to 10.
2. Connect the controllers to the two data communications, LON and MODBUS. Switch on the controllers and set an address in each controller. Addresses may not be duplicated – not even with addresses on the DANBUSS network.
3. Apply power to the system manager
4. If a static IP address is used, this must be set
5. Enter the system manager's service PIN



Preparing the AK-PI 200

1. Set its address on the front (e.g. to 12)
2. Apply the power
3. If a static IP address is used, this must be set
4. Set network number for the DANBUSS group.
(In previously version (1.0x) of AK-PI 200 the number is not visible but is fixed programmed to 1. If it is a updating of AK-PI 200 to version 1.1x it must be set to 1.)
5. (You can activate the "Service PIN" function at this point.
If you do, this means you do not have to start the scan function in the next point.)



Perform the first scan

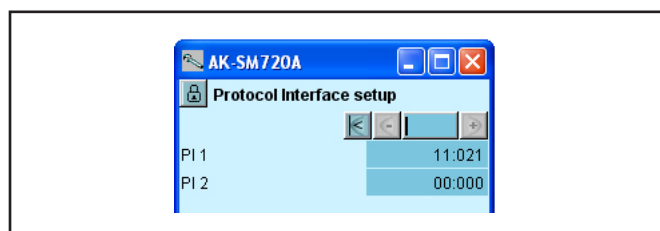
1. Start the scan function in the system manager – wait for the results
(the controllers on the LON and MODBUS communication will now be located and visible in the network overview).
2. Go to the next page of the network overview, which details the IP registrations.
Check that the AK-PI unit is registered.



Interconnection

Define which AK-PI 200 unit the system manager should recognise (several units can be registered but the system manager with address 1 can only control two units).

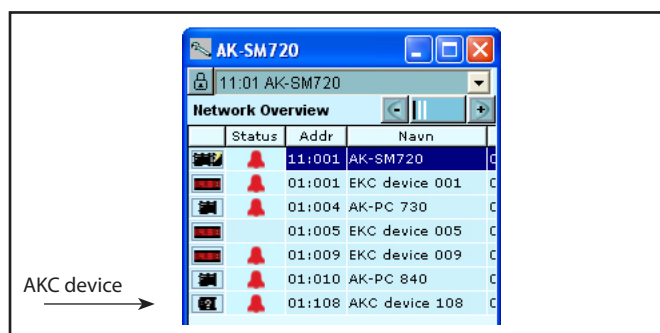
1. There is a menu in the system manager in which settings must be entered. Go to the Setup menu/Protocol interface (the system manager must be version 1.20 or later).
2. Select the address of the AK-PI 200, which is to be connected to the system unit.



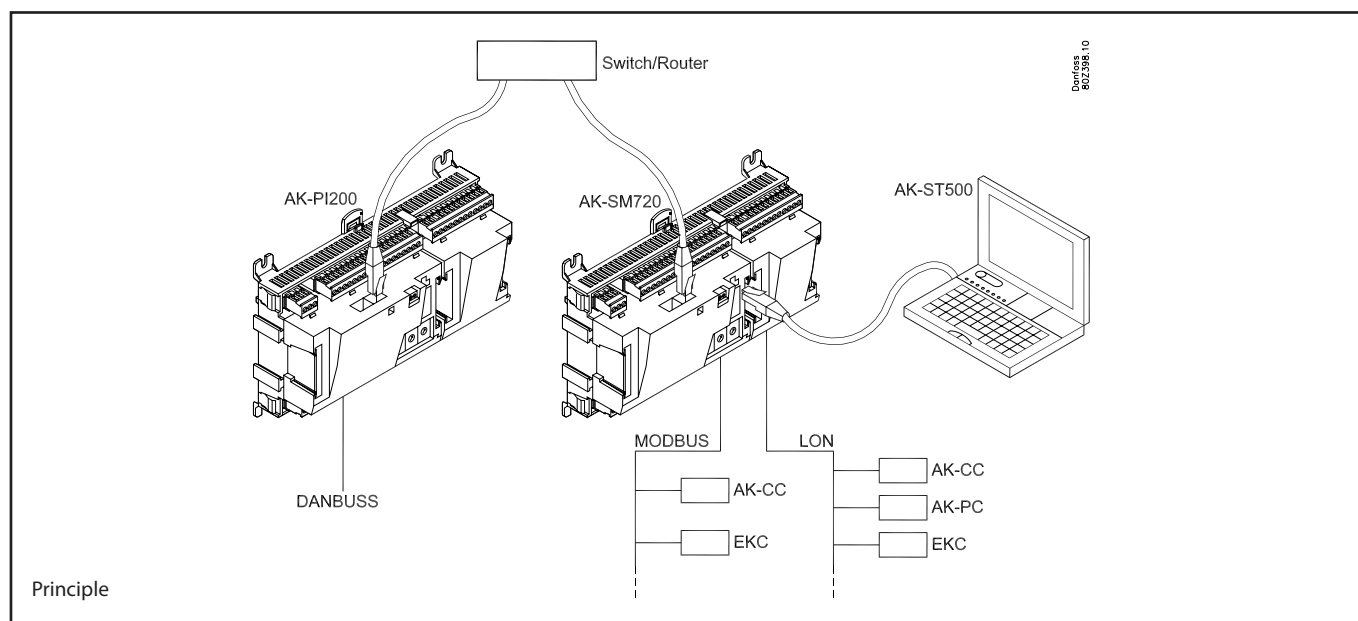
Perform scan number 2 and locate the DANBUSS controllers

1. Perform a new scan of the system manager. Wait for the results.
(All controllers will now be located.)

See the system manager manual for further installation.

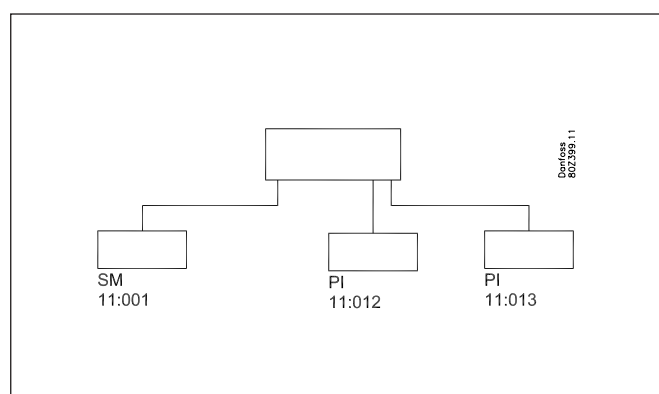


Requirements and terms



- The installation of the data communication must be carried out as specified in the guide to the RC8AC.
- The terminations must be in order.
- Language options in an AKC controller
When data is retrieved and sent to the AK-PI 200 and then on to the system manager and operation software, it will appear in the language selected in the controller.
If the wrong language is displayed, the AK-PI 200 must be restored to factory settings and an associated file on the PC must be deleted.
(C:\Program files\ADAP-KOOL\Service tool\Data\Cashe\Code no).
The whole process must then be repeated, but this time with a different language selected.
- Network addresses
Here is a small summary of the networks and addresses that can occur:
11:001 is the master system manager
11:002 to 11:010 are slave networks controlled by 11:001 (the figure "11" keeps track of the networks and cannot be changed).
11:012 to 11:999 are addresses for units on the network. The units can be AK-PI 200 units or wireless units, or they can be controllers in which the data communication takes place via TCP/IP.
1: xxx will be controllers that are registered under the master system manager.
2: xxx will be controllers that are registered under slave network number 2.

- Up to 60 AKC controllers can be connected to a single AK-PI 200.
- Up to two AK-PI 200 units can be connected to a single system manager.
- Up to 20 different types of AKC controller can be connected.
- **There must not be a gateway or an AKA 21 connected to the DANBUSS communication – it is the AK-PI 200 that controls the communication to the controllers.**

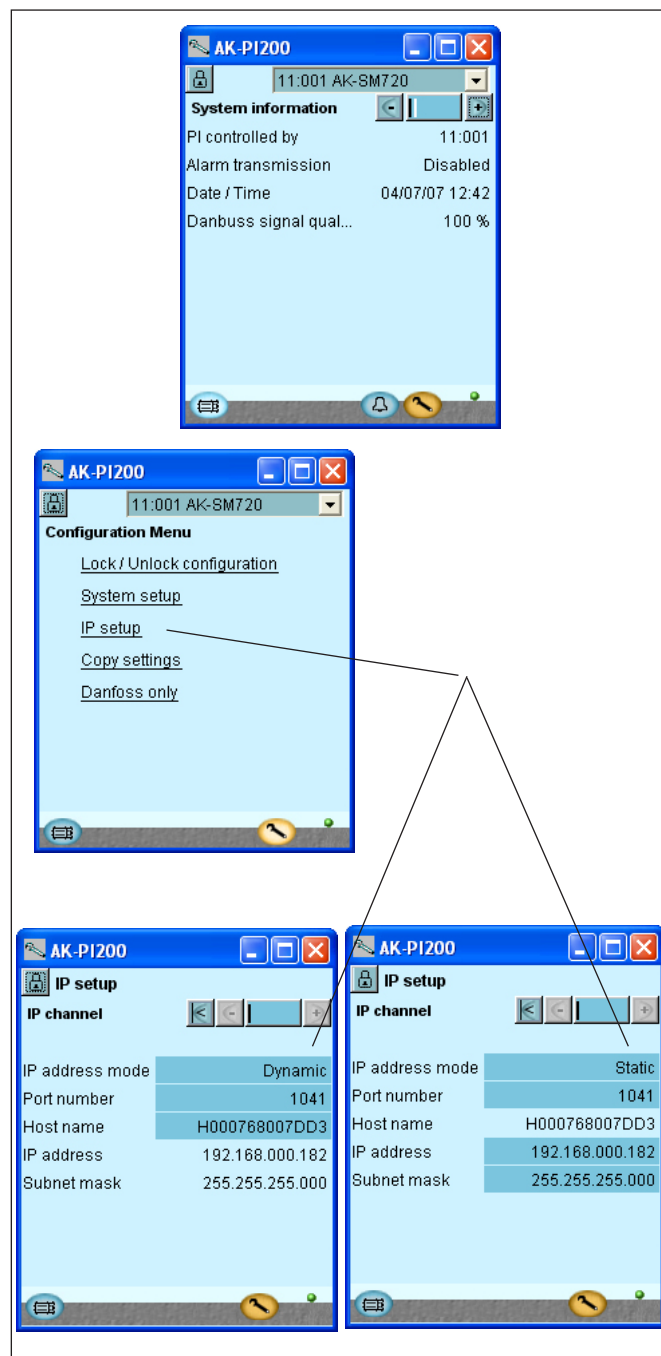


The overview display will show the following:

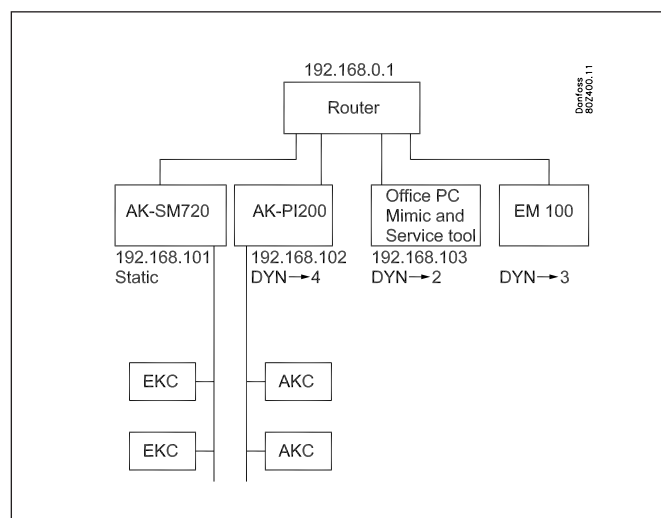
- The address of the system manager that AK-PI 200 is connected to
- The status of the alarm transmission
- Date and time
- The quality of the DANBUSS communication signal

The configuration display gives access to the following:

- The configuration lock is only used if a static IP address is to be set.
- Under "System setup" you can give the unit a name
- IP settings can be entered



Examples of IP addresses




Ordering

Type	Function	Application	Language	Code no.
AK-PI 200	Protocol interface	Intermediary link between system manager and controllers with DANBUSS data communication	English, German, French, Italian, Dutch, Spanish, Portuguese, Danish, Swedish and Finnish	080Z8521

Accessories	Transformer module 230 V / 115 V to 24 V		
AK-PS 075	18 VA	Supply	080Z0053

Data

Supply voltage	24 V a.c. +/- 20%	
Power consumption	AK-PI 200	12 VA
Ambient temperature	During transport	-40 to 70°C
	During operation	-20 to 55°C, 0 to 95% RH (non condensing) No shock influences / vibrations
Enclosure	Material	PC / ABS
	Density	IP10, VBG 4
	Mounting	For mounting on wall or DIN rail
	Weight	Approx. 600 g
Approvals	EU low voltage directive and EMC requirements are complied with	LVD tested according to EN 60730 EMC tested Immunity according to EN 61000-6-2 Emission according to EN 50081-1
	UL 873, c 	UL file number: E166834

