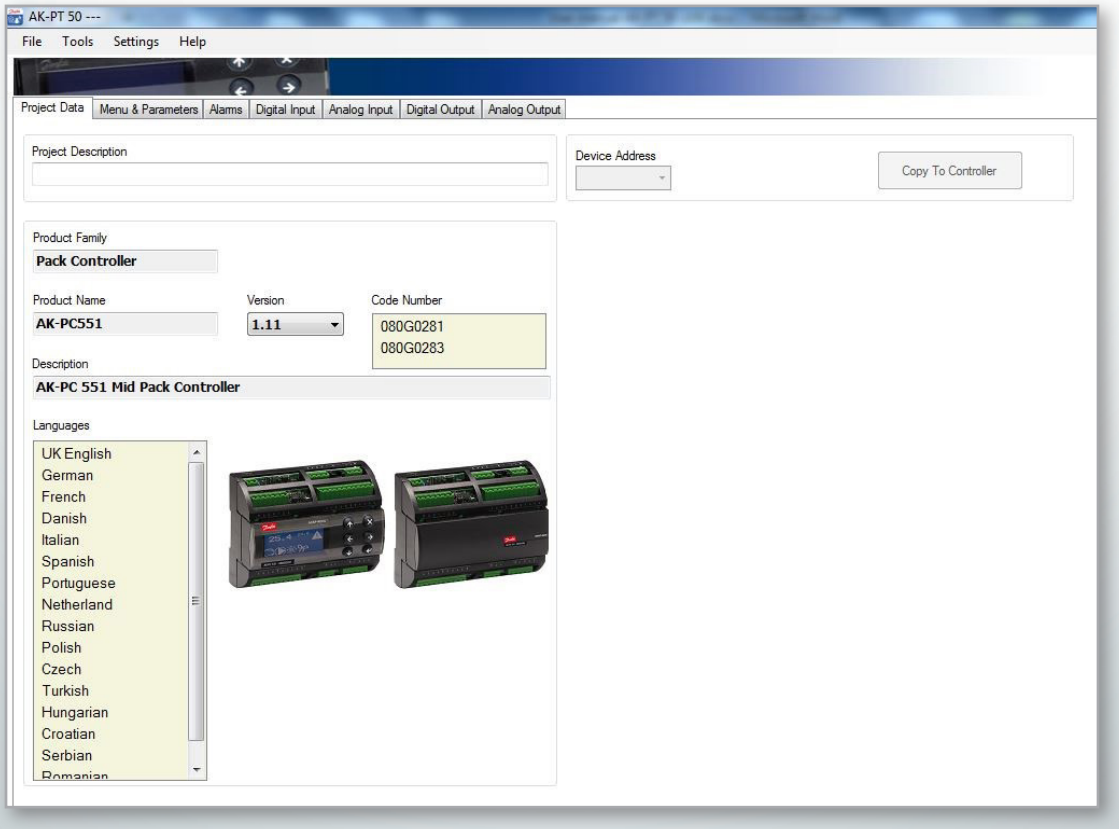
ENGINEERING
TOMORROW

User Guide

AK-PT 50

Programming tool for pack controller
Type AK-PC 351, 551, 572, 651, 651A

SW Ver. 4.04



Contents

1. Introduction

AK-PT is a software developed by Danfoss for managing parameter set-up of AK-PC 351/551/572/651 /651A pack controllers.

With a simple and intuitive user interface, AK-PT allows the complete configuration of all controller parameters. AK-PT can manage the controller parameters in an offline mode by creating new controller set-up projects or by opening previously saved set-up files. The AK-PT also supports direct live connection to controller for set-up, test and service purposes.

Parameter set-up files can easily be saved for later use and printed for documentation purposes.

New controller types or controllers with new software versions are easily supported by importing a controller package file provided by Danfoss

2. Minimum system requirements

Hardware requirements:

- Processor: Pentium 4, 3.0 GHz (or equivalent) or higher
- RAM: 1 GB
- Hard disk fixed: at least 100 MB free space
- An MMIMYK converter is required (order no. 080G0073) in order to connect a controller to the AK-PT
- RJ11 telephone connector cable (080G0075 – 1.5 m) for direct connection to AK-PC 551 / AK-PC 572 / AK-PC 651 / AK-PC 651A
- Furthermore a USB to Mini USB cable is required.

Software requirements:

- Operating system: Microsoft® Windows® 7 or newer

Important: the system must be accessed using the administrator account on the computer to correctly install the software.

3. Controller types handled by software

The AK-PT supports the following controller types:
AK-PC 351: Pack controller with up to four compressors
AK-PC 551: Pack controller with one or two suction groups and max. eight compressors
AK-PC 572: CO_2 MiniPack controller with up to three compressors on MT and two compressors on LT
AK-PC 651/651A: Pack controller with up to ten compressors

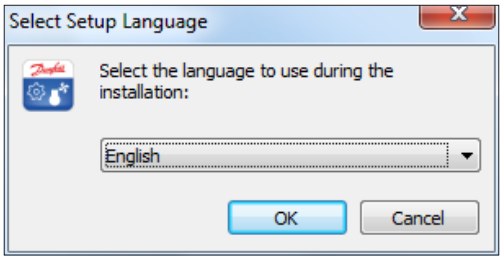
When AK-PT 50 has been installed, released software versions of these controllers will be supported.

New software releases will be supported by importing controller package files for the controller in question – please refer to the paragraph "Import new controller types" for further information.

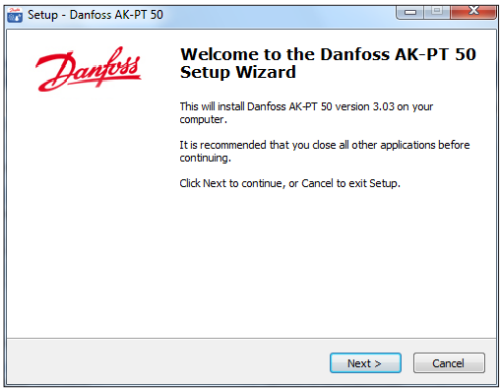
4. Installation

Once the AK-PT installation package has been unzipped, the installation process is initiated by double clicking the installation file. The installation package will guide you through the installation process.

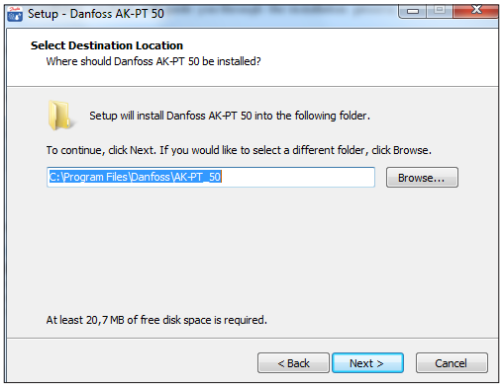
1: Select language for installation



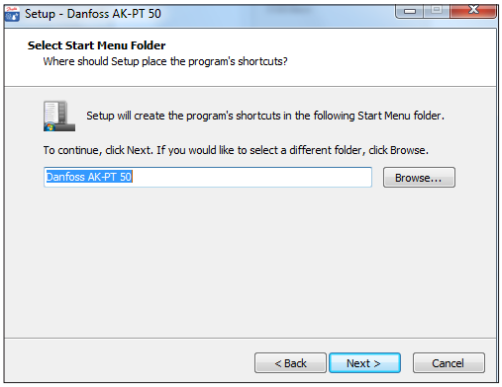
2. Welcome screen



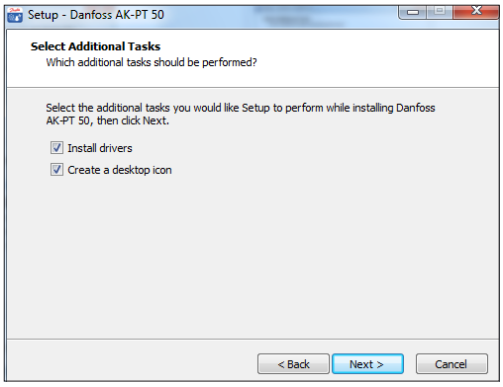
3. Select directory for program installation



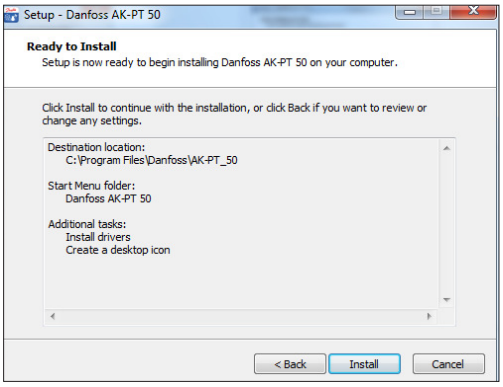
4. Give name to short cut on desktop



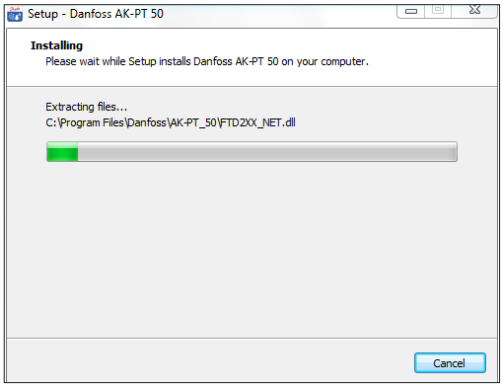
5. Install drivers



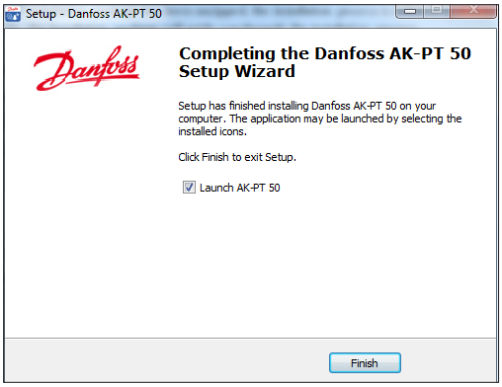
6. Installation summary screen



7. Installing program



8. End of installation

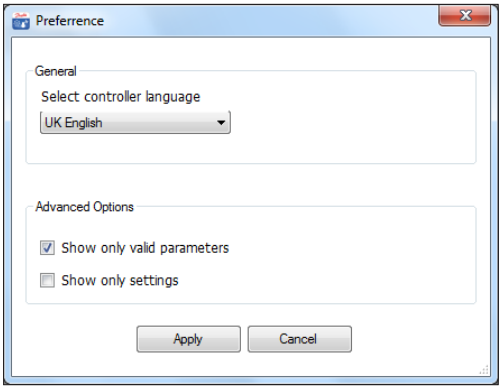


After having finished installation, a short cut to start the AK-PT is created on the desktop and in the program menu:

Once the program is installed, it will launch the AK-PT for the first time (unless this option has been de-selected during the installation process.

5. First time start-up

When starting the program for the first time, a pop-up window will appear in order to fill in user preferences for the software – please refer to the screen example below:



Select controller language
Here you can select in which language controller menus and parameter texts are to be presented. The drop box will give the possible language options for the supported controllers.

If a preferred language is not supported by a particular controller, the menu and parameter texts will be shown in English.

Please be aware that the AK-PT software itself only supports English text.

Advanced options
The advanced options are used when presenting controller menus and parameters.

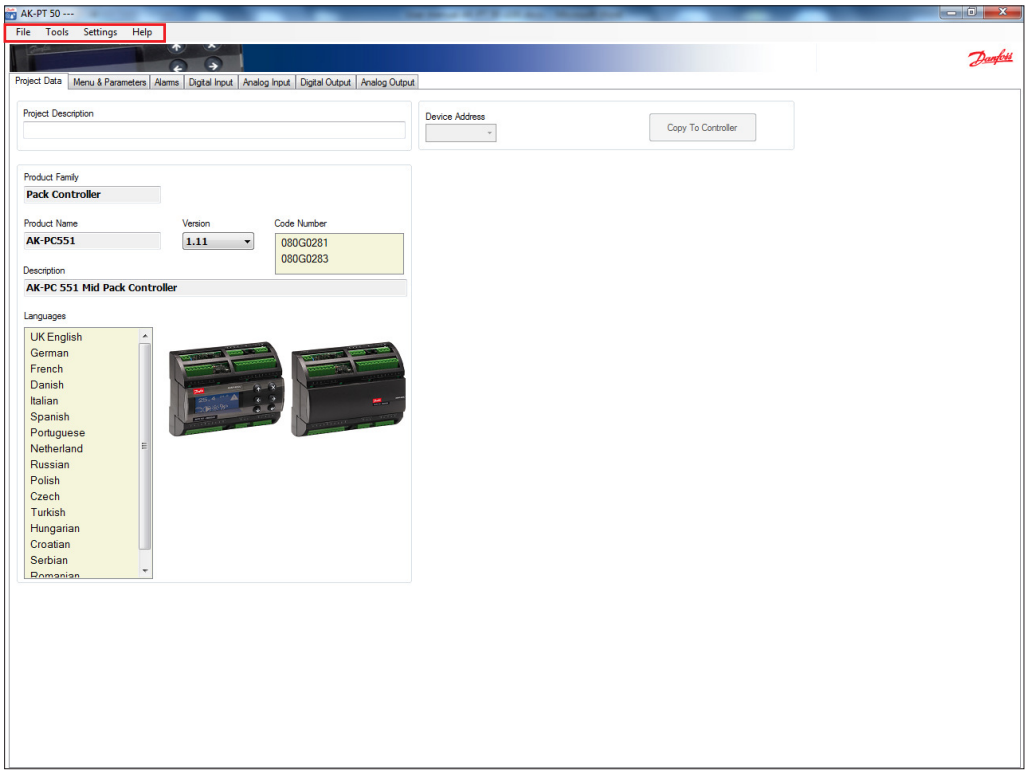
By setting a check mark in "Show only valid parameters", the AK-PT will only present parameters that are valid for a given set-up of a controller i.e. if only four compressors are set up, only parameters for the four compressors are shown. If no check mark is set – all parameters will be shown at all times.

By setting a check mark in "Show only settings", the AK-PT will only present settings in the "Menu & Parameters" tab when running in offline mode. In online mode all readouts are always shown.

The preferences can be changed later via the "Settings" → "Preference menu" (Ctrl + P).

6. Functional menus

The functional menus are placed in the top left corner of the screen – please refer to the screen below:



6.1 File menu

New
Start a new project by selecting a particular controller type with factory default settings. When a controller type is selected, AK-PT will by default open the latest software version of this controller type.

Open
Edit a previously saved controller set-up.

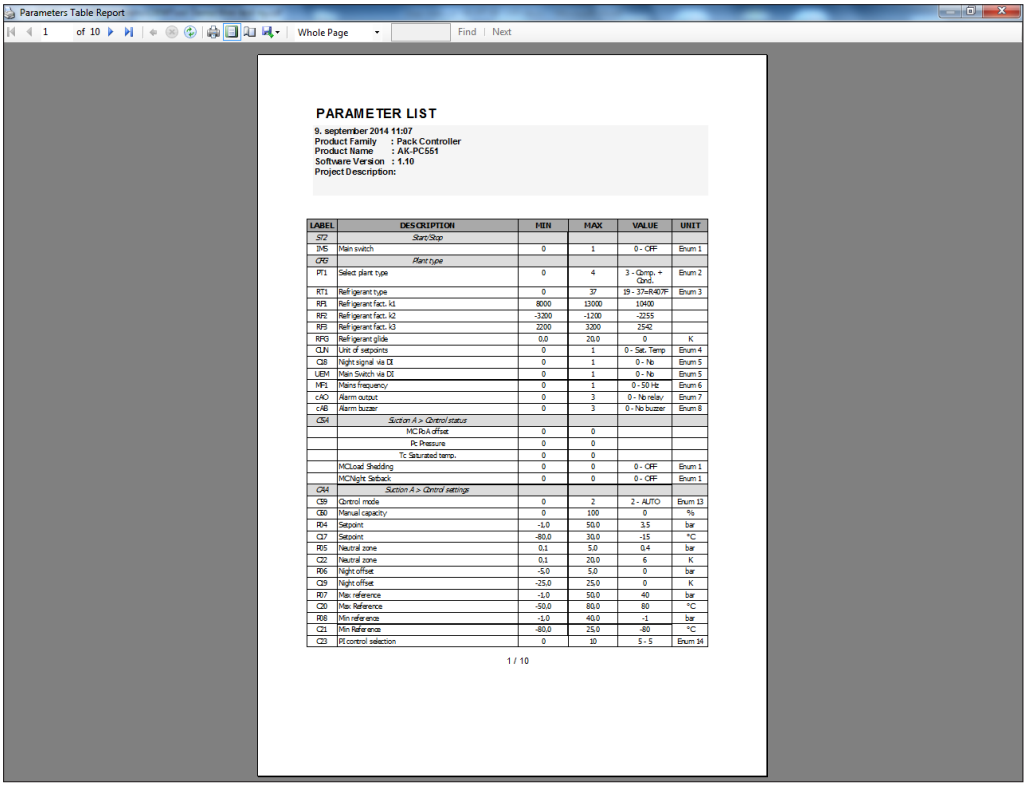
Service and test
Generates an online communication with a controller via a connection to the MMIMYK gateway. The AK-PT shows actual values from the connected controller, and settings are written directly to the controller. Please refer to the section "Connect controller to AK-PT" or the tutorial "How to set up and service a controller online" for further details.

Disconnect
Disconnect the communication to an online controller. It is possible to continue editing the parameters offline.

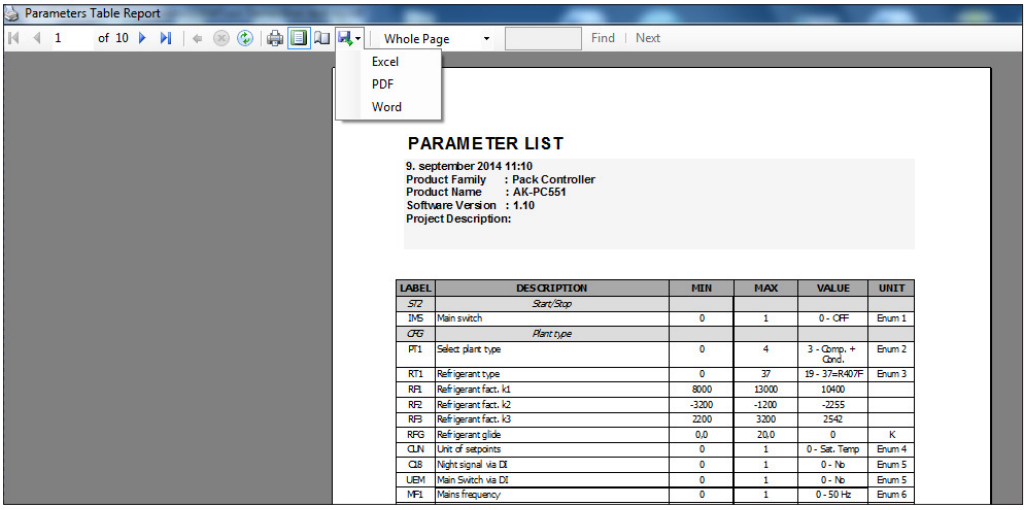
Save and Save as
Save the actual controller set-up in a file.
In order to easily identify set-up files it is recommended to include the controller type name and software version in the file name.

Print and export settings

Printout of the controller settings.
Initiating printout brings up a print friendly presentation of the controller parameters and IO configuration – please refer to the screen example below:



From the toolbar it is possible to print out the settings or to export the data to excel, PDF or Word format – please refer to the screen example below:



Recent projects

List of the recently used controller projects.

Exit

Close the AK-PT program.

6.2 Tools menu

Import controller file
Import a controller package file (CPF/CDF) for a new controller type. A new controller package file must be imported when Danfoss releases a new software version of a supported controller. Please refer to the paragraph "Import new controller types" for further details. New CPF/CDF files can be found on the Global Product Support site.

Auto configure IO
This function is only available offline. It will automatically assign all enabled IO functions to inputs and outputs of the controller. Please refer to paragraph "Auto configuration of inputs and outputs" for further details.

Note: For the AK-PC 351 and AK-PC 572 controllers, all input and output functions are automatically assigned to the controller inputs and outputs and they cannot be changed.

6.3 Settings menu

Preferences
Set up preferred language for presentation of controller parameters.
By setting a check mark in "Show only valid parameters", the AK-PT will only present parameters that are valid for a given set-up of a controller i.e. if only four compressors are set up, only parameters for the four compressors are shown. If no check mark is set – all parameters will be shown at all times.
By setting a check mark in "Show only settings", the AK-PT will only present settings in the "Menu & Parameters" tab – readouts are not shown.

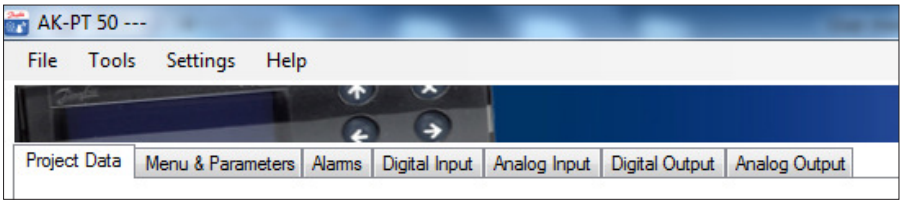
6.4 Help menu

About
Information about software version and build number of AK-PT.

7. Controller main screens

Before we go to the details of how to work with controller settings, the main screens and screen elements are explained here.

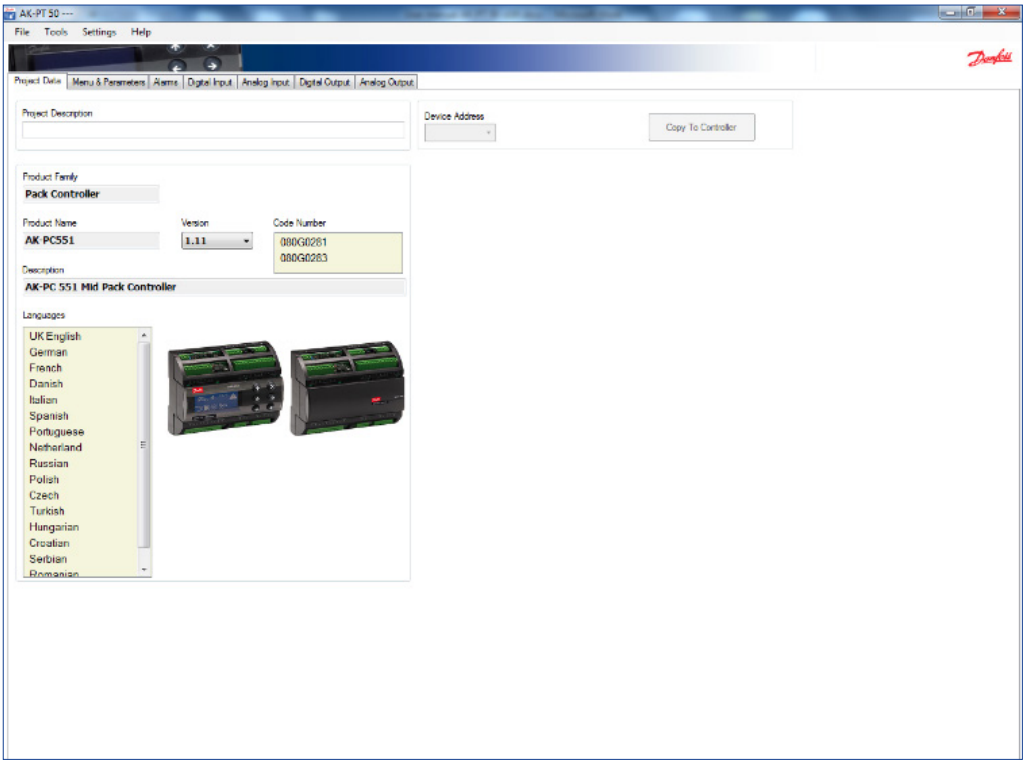
You can navigate through the controller main screens via the tabs placed on the top of the page – please refer to the screen details below:



The screen elements of the controller main screens are explained below.

7.1 Project Data screen

This screen is used to see the properties of the controller set-up project you are working on. It also allows you to copy settings to the controller:



Screen elements:

Project description
Editable text field used to make a custom description of the controller set-up project.

Product family
Readout of the product category of actual loaded controller type i.e. pack controller.

Product name
Product type of controller loaded e.g. AK-PC 351, AK-PC 551, AK-PC 572 or AK-PC 651/651A.

Version
Drop-down box for selection of software version of the controller (only available in offline mode). Please be aware that when starting a new project, the loaded controller set-up will always be for the latest software version. Via the drop down box it is possible to select an earlier software version if required.

Code number
Text box showing code numbers of the controllers that comply with the loaded controller type in question.

Description
Text field giving more detailed description of the loaded controller type.

Languages
List of languages supported by the loaded controller.

Device address
The device address field will show the network address of a controller connected to the AK-PT via the MMIMYK gateway.

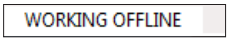
However, if the connected controller is not compliant (wrong controller type or wrong software version) with the controller loaded in the AK-PT, the device address field will not show any address.

Copy to controller
Press button to copy the actual settings from the AK-PT to a connected controller.

The button is only enabled if a compliant controller is connected to the AK-PT.
If the connected controller is not compliant (wrong controller type or wrong software version), the "Copy to controller" button will not be enabled (Grey).

Note: Do not start the programming before the main screen is shown on the controller. If the controller has not been programmed before, it should say "No application configured".

Controller connection status
The controller connection status can be found at the lower left corner of the screen.
When working offline, the connection status readout will show "working offline":

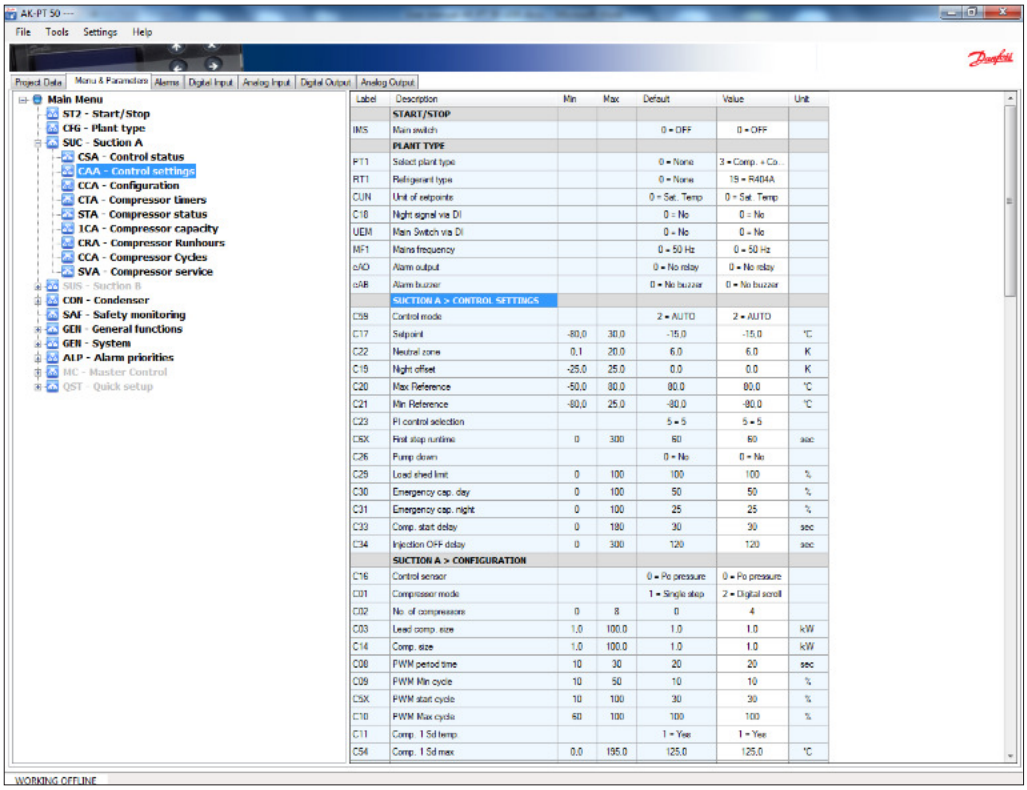


When working online (service and test), the connection status readout will show "Working online":

If communication is lost while online (service and test), the connection status will show "Working online", but with a red flashing indication for lost communication. You will still be able to work with the controller parameters offline.

7.2 Menu & Parameters screen

This screen is used for setting all application parameters for the controller:



Screen elements:

Menu tree
The left side of the screen shows the controller menu tree with menu and sub-menu groups.
By selecting a menu, the parameter table on the right side of the screen will navigate to the selected menu.

Parameter table
The right side of the screen shows the complete list of application parameters for the controller.

Parameters that can be written are shown with black font colour. Parameter values can be changed by clicking the value field and changing the value. The value will be accepted by navigating to another field or by pressing "Enter".

If you have selected only to see valid parameters (see preferences), the parameter table will only show the parameters that are valid for a given set-up. So the table will be dynamic.

Parameters that are read-only or status parameters are shown with grey font color.

If you have selected only to see settings (see preferences), the parameter table will only show writable parameters.

Note: In general it is recommended to configure the controller by following the sequence of the menu groups. Start from the top menu and continue down through the menu groups. The reason being that some settings might enable new menu entries or parameters placed lower in the menu structure.

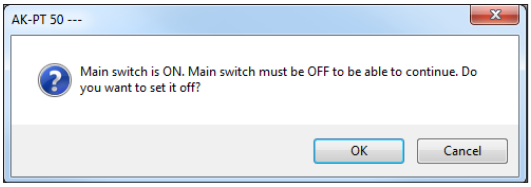
It is a good idea to start by setting the parameter "Unit of setpoints" in the Plant type menu. This parameter defines whether control reference setpoints are using (Saturated) Temperature or Pressure units.

Tool tip
Right mouse click in the parameter table brings up a "Find" option (Ctrl + F).

This allows you to quickly find parameters or menus that fit the typed-in text phrase.

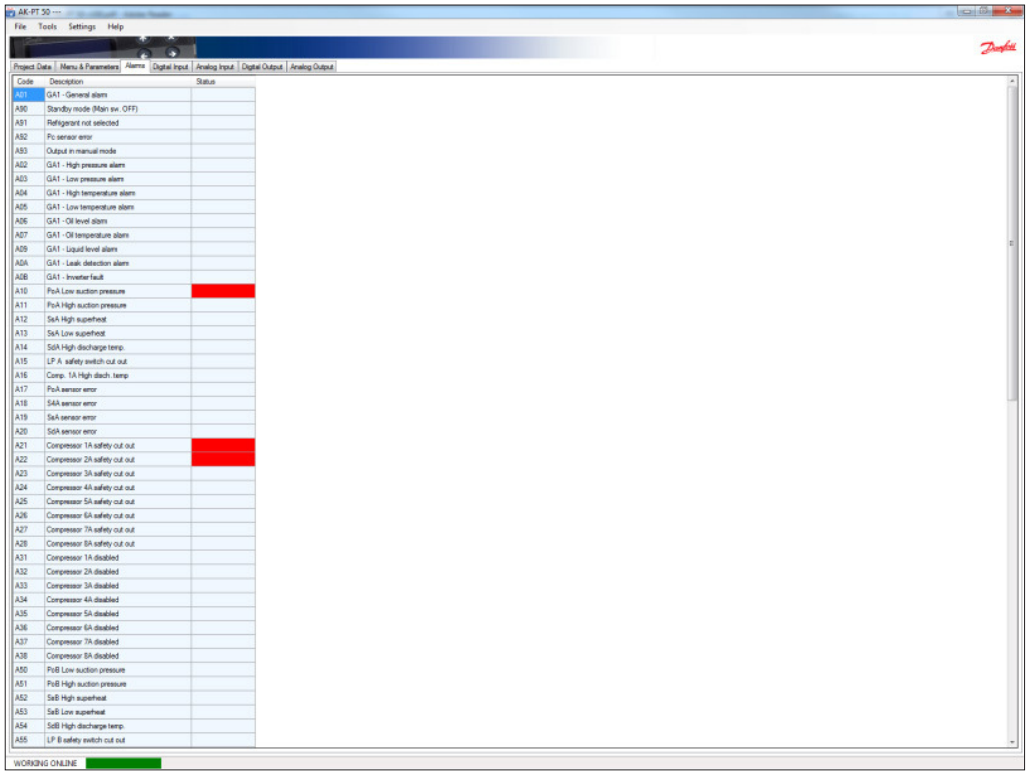
Online mode
In online mode, the menu tree is used to select a controller menu and the parameter table only shows the parameters that belong to the selected menu. This is done in order to increase data refresh speed (the AK-PT does not have to read all parameters from the controller).

In online mode, many configuration parameters are protected from being changed while Main switch setting is ON. Trying to change a protected setting will result in a pop-up window requesting to set Main Switch OFF in order to change the protected setpoint – please refer to the screen below:



7.3 Alarms screen

This screen shows the list of controller alarms:



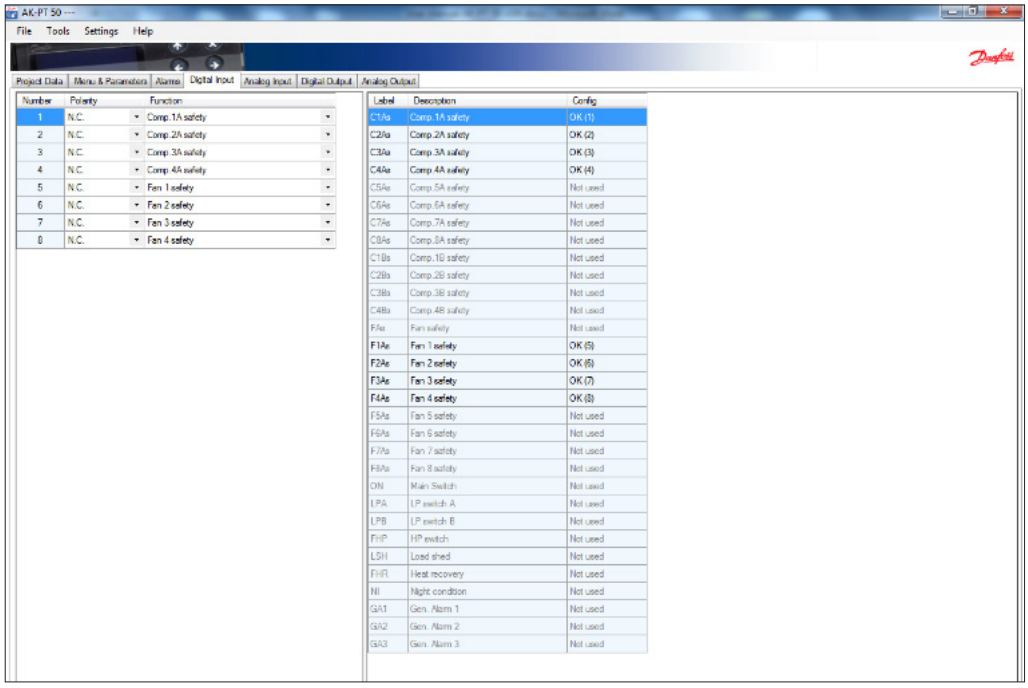
Screen elements:

Alarm list
In offline mode the screen will only list the possible alarms.

Online mode
In online mode the list will show which alarms are active on the connected controller. A red status field indicates that the alarm is active.

7.4 Digital Input screen

This screen is used to configure all digital inputs of the controller:



Screen elements:

Complete list of digital input functions
The table on the right side of the screen shows the complete list of possible digital input functions which are supported by the controller.

Input functions that are shown with black font colour are functions that are enabled through the parameter set-up in "Menu & Parameters". In this example, four compressor safety inputs and four fan safety inputs have been enabled.

Input functions that are shown with grey colour are not used for the given controller set-up.

List of digital inputs on the controller
The table on the left side of the screen shows the digital inputs on the controller. In this example the controller has eight digital inputs.

For each of these digital inputs you must select one of the enabled functions and whether it is set to NO (Normally Open) or NC (Normally Closed) action.
- NO means that the function is active at closed digital input.
- NC means that the function is active at open digital input.

Note: For the AK-PC 351 and AK-PC 572 controllers, all input and output functions are automatically assigned to the controller inputs and outputs and they cannot be changed.

How to configure the digital inputs of the controller
By clicking the "Function" drop-down box at a digital input, you can select which of the enabled input functions that must be associated with this digital input of the controller. In this example the safety monitoring input of Compressor 1 has been associated with digital input no. 1 of the controller.

When an enabled input function has been associated with a digital input on the controller, the "Config" field of the input function will show OK and in brackets it will show the number of the digital input it has been associated with:

Label	Description	Config
C1As	Comp.1A safety	OK (1)

If an enabled input function has NOT yet been associated with a digital input on the controller, the "Config" field of the input field will show "Missing":

Label	Description	Config
C1As	Comp.1A safety	Missing

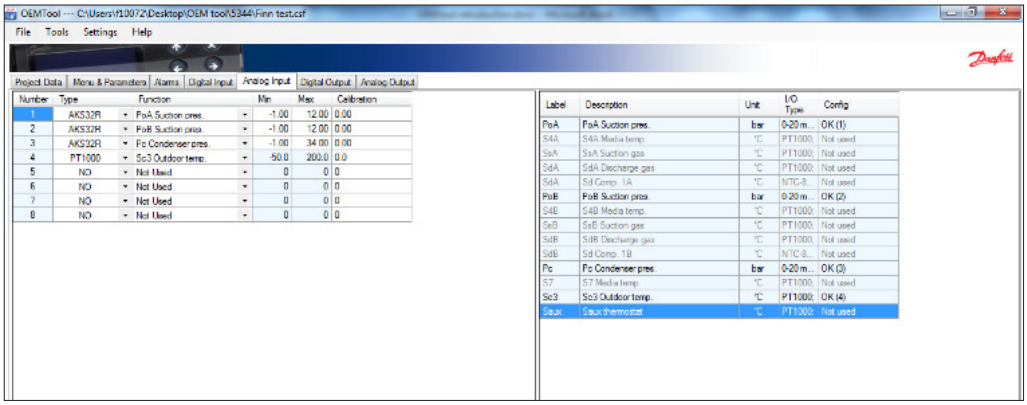
So in order to check whether all digital inputs have been associated with a digital input of the controller, just run through the "Config" column and check that all enabled input functions have an "OK" mark and no "Missing" mark.

Online mode
In online mode (service and test) with a connected controller, the controller digital input list is extended with an extra column that shows the actual status of the digital input – please refer to the screen below:

Number	Polarity	Function	Value
1	N.C.	Comp.1A safety	OFF
2	N.C.	Comp.2A safety	OFF
3	N.C.	Comp.3A safety	OFF
4	N.C.	Comp.4A safety	OFF
5	N.C.	Fan 1 safety	OFF
6	N.C.	Fan 2 safety	OFF
7	N.C.	Fan 3 safety	OFF
8	N.C.	Fan 4 safety	OFF

7.5 Analogue Input screen

This screen is used to configure all analogue inputs of the controller:



Screen elements:

Complete list of analogue input functions
The table on the right side of the screen shows the complete list of possible analogue input functions which are supported by the controller.

Analogue input functions that are shown with black font colour are enabled through the parameter set-up in "Menu & Parameters". In this example four sensor inputs have been enabled.

Input functions that are shown with grey colour are not used for the given controller set-up.

List of analogue inputs on the controller
The table on the left side of the screen shows the analogue inputs of the controller. In this example the controller has 8 analogue inputs.

For each of these analogue inputs you must first select one of the enabled functions via the drop-down box.

Once the function has been defined, the sensor signal can be defined in the "Type" field.

Finally, if the selected function requires a pressure transmitter sensor, the Min. and Max. pressure ranges (Bar) for the pressure transmitter must be defined.

Note: The analogue inputs on the controller might support different sensor signals. For AK-PC 551 current signals of 0 – 20 mA or 4 – 20mA are only supported on analogue inputs 1-4. So if you wish to use such a signal type for the suction pressure, the suction pressure senor must be defined on analogue inputs 1-4 (please refer to the User Guide of the controller in question for these details).

How to configure the analogue inputs of the controller
By clicking the "Function" drop-down box at an analogue input, you can select which of the enabled input functions that must be associated with this analogue input of the controller. In this example the suction pressure for suction group A has been associated with analogue input no. 1 of the controller:

Number	Type	Function	Min	Max	Calibration
1	AKS32R	PoA Suction pres.	-1.00	12.00	0.00

When an enabled input function has been associated with an analogue input of the controller, the "Config" field of the input function will show OK and in brackets it will show the number of the digital input it has been associated with:

Label	Description	Unit	I/O Type	Config
PoA	PoA Suction pres.	bar	0-20 m...	OK (1)

If an enabled input function has NOT yet been associated with an analogue input of the controller, the "Config" field of the input field will show "Missing":

Label	Description	Unit	I/O Type	Config
PoA	PoA Suction pres.	bar	0-20 m...	Missing

So in order to check whether all analogue inputs have been associated with an analogue input of the controller, just run through the "Config" column and check that all enabled analogue input functions have an "OK" mark and no "Missing" mark.

Note: For the AK-PC 351 and AK-PC 572 controllers, all input and output functions are automatically assigned to the controller inputs and outputs and they cannot be changed.

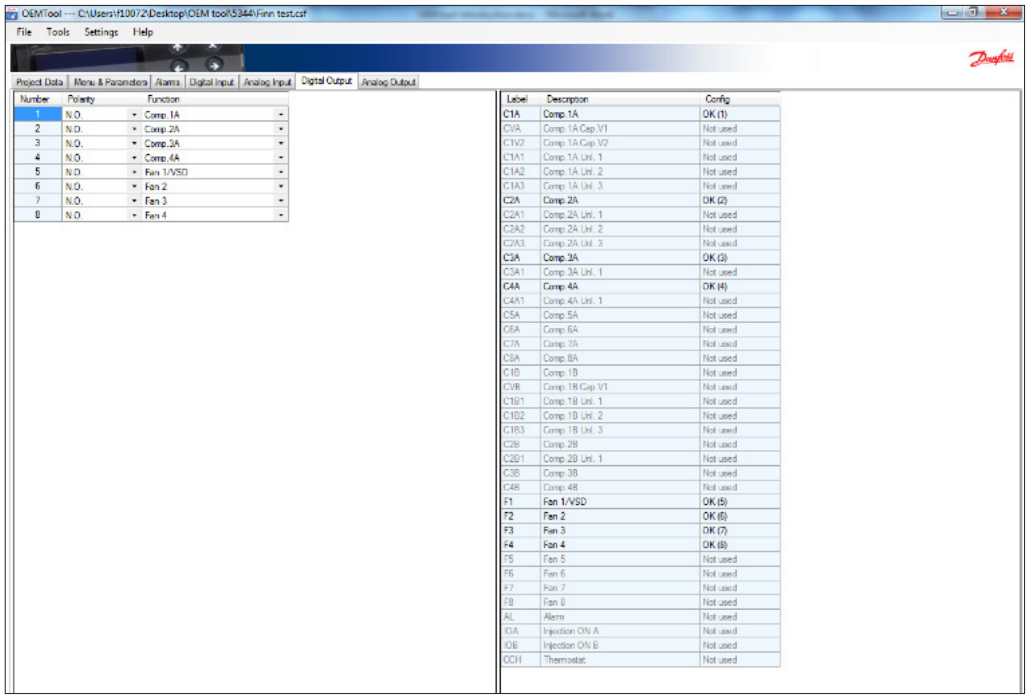
Online mode
In online mode (service and test) with a connected controller, the controller analogue input list is extended with an extra column that shows the actual status of the sensor signal – please refer to the screen below:

Number	Type	Function	Min	Max	Calibration	Value
1	AKS32R	PoA Suction pres.	-1.00	12.00	0.00	3.77
2	AKS32R	Pc Condenser pres.	-1.00	34.00	0.00	11.86
3	PT1000	Sc3 Outdoor temp.	-50.0	200.0	0.0	24.6
4	PT1000	Not Used	-500	2000	0	*****
5	NO	Not Used	0	0	0	*****
6	NO	Not Used	0	0	0	*****
7	NO	Not Used	0	0	0	*****
8	NO	Not Used	0	0	0	*****

Pressure signals are read out in Bar and temperature signals in degree Celsius.
Defective or not used sensor values will be shown as stars.

7.6 Digital Output screen

This screen is used to configure all digital outputs of the controller:



Screen elements:

Complete list of digital output functions
The table on the right side of the screen shows the complete list of possible digital output functions which are supported by the controller.

Output functions that are shown with black font colour are functions that are enabled through the parameter set-up in "Menu & Parameters". In this example four compressor and four fan outputs have been defined.

Output functions that are shown with grey colour are not used for the given controller set-up.

List of digital outputs on the controller
The table on the left side of the screen shows the digital outputs on the controller. In this example the controller has eight digital outputs.

For each of these digital outputs you must define the function and whether it is set to NO (Normally Open) or NC (Normally Closed) action.

- NO means that the function is active at activated relay.
- NC means that the function is active at deactivated relay.

Note: The digital outputs of the controller might support different functions. As an example AK-PC 551 and AK-PC 651 have solid state outputs on DO5 and DO6, so only these outputs support functions with high switch rates, such as pulse width modulated capacity valves for Digital scroll, Copeland Stream and Bitzer Ecoline CRII compressors - please refer to the User Guide of the controller in question for these details.

How to configure the digital outputs of the controller
By clicking the "Function" dropdown box at a digital output, you can select which of the enabled output functions that must be associated with this digital output of the controller. In this example, Compressor 1 has been associated with digital output no. 1 of the controller:

Number	Polarity	Function
1	N.O.	Comp.1A

When an enabled output function has been associated with a digital output of the controller, the "Config" field of the output function will show OK and in brackets it will show the number of the digital output it has been associated with:

Label	Description	Config
C1A	Comp.1A	OK (1)

If an enabled output function has NOT yet been associated with a digital output on the controller, the "Config" field of the output function will show "Missing":

Label	Description	Config
C1A	Comp.1A	Missing

So in order to check whether all enabled digital output functions have been associated with a digital output of the controller, just run through the "Config" column and check that all enabled output functions have an "OK" mark and no "Missing" mark.

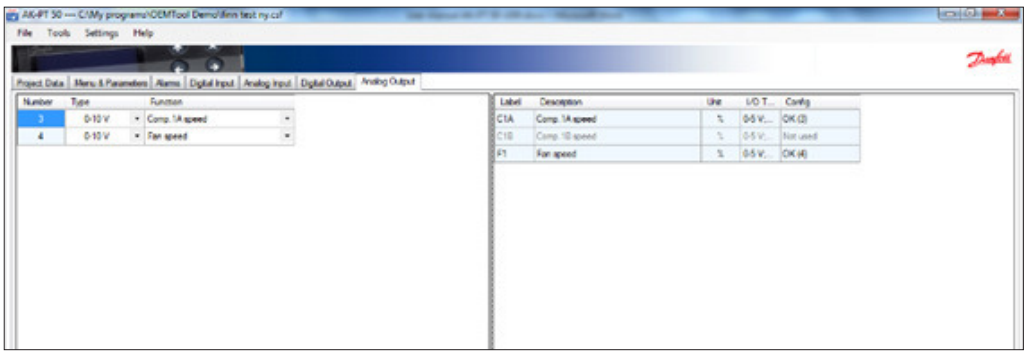
Note: For the AK-PC 351 and AK-PC 572 controllers, all input and output functions are automatically assigned to the controller inputs and outputs and they cannot be changed.

Online mode
In online mode (service and test) with a connected controller, the controller digital output list is extended with two extra columns that enable manual override of the output (test) and which show the actual status of the digital output – please refer to the screen below:

Number	Polarity	Function	Override Mode	Value
1	N.O.	Comp.1A	AUTO	OFF
2	N.O.	Comp.2A	AUTO	OFF
3	N.O.	Comp.3A	AUTO	OFF
4	N.O.	Comp.4A	AUTO	OFF
5	N.O.	Fan 1/VSD	AUTO	OFF
6	N.O.	Fan 2	AUTO	OFF
7	N.O.	Fan 3	AUTO	OFF
8	N.O.	Fan 4	AUTO	OFF

7.7 Analog Output screen

This screen is used to configure all analogue outputs of the controller:



Screen elements:

Complete list of analogue output functions
The table on the right side of the screen shows the complete list of possible analogue output functions which are supported by the controller.

Output functions that are shown with black font colour are functions that are enabled through the parameter set-up in "Menu & Parameters". In this example Compressor speed and Fan speed outputs have been defined.

Output functions that are shown with grey colour are not used for the given controller set-up.

List of analogue outputs on the controller
The table on the left side of the screen shows the analogue outputs on the controller. In this example the controller has two analogue outputs.

For each of these analogue outputs you must define the function and the type of output signal (0-5V or 0 – 10 V).

How to configure the analogue outputs of the controller
By clicking the "Function" drop-down box at an analogue output you can select which of the enabled output functions that must be associated with this analogue output of the controller. In this example, Compressor 1speed function has been associated with analogue output no. 3 of the controller.

Number	Type	Function
3	0-10 V	Comp.1A speed
4	0-10 V	Fan speed

When an enabled output function has been associated with an analogue output of the controller, the "Config" field of the output function will show OK and in brackets it will show the number of the analogue output it has been associated with:

Label	Description	Unit	I/O Type	Config
C1A	Comp.1A speed	%	0-5 V;...	OK (3)

If an enabled output function has NOT yet been associated with an analogue output of the controller, the "Config" field of the output function will show "Missing":

Label	Description	Unit	I/O Type	Config
C1A	Comp.1A speed	%	0-5 V;...	Missing

So in order to check whether all enabled analogue output functions have been associated with an analogue output of the controller, just run through the "Config" column and check that all enabled output functions have an "OK" mark and no "Missing" mark.

Note: For the AK-PC 351 and AK-PC 572 controllers, all input and output functions are automatically assigned to the controller inputs and outputs and they cannot be changed.

Online mode
In online mode (service and test) with a connected controller, the controller analogue output list is extended with three extra columns that enable manual override of the output (test) and which shows the actual status of the analogue output – please refer to the screen below.

To make an override:
Set "Override mode" to "Manual" and then set override value – please be aware that the override value is set in percent of the selected output signal. If the output signal type is selected to 0 – 10 V and the override value is set to 10%, the output measured will be 1 V.

Number	Type	Function	Override Mode	Override Value	Value
3	0-10 V	Comp.1A speed	AUTO	0.0	0.0
4	0-10 V	Fan speed	AUTO	0.0	0.0

7.8. Auto configuration of all inputs and outputs - offline

Auto configuration of all inputs and outputs is a time saving feature that allows AK-PT to configure all inputs and outputs of a controller in one operation.

Auto configuration of inputs and outputs can only be used in offline mode (does not work when in Service and test mode).

Auto configuration of all inputs and outputs can be initiated via the menu "Tools" → "Auto configure IO".

Procedure for using auto configuration of inputs and outputs:

1. Set up the controller parameters in the "Menu & parameter" screen.
2. This will enable different input and output functions used by the controller i.e. if four compressors have been set up, four digital output functions will be enabled for compressor 1-4. The enabled IO functions are shown with black font colour in the IO screens - please refer to the previous pages containing the input and output screens.
3. Selecting the function "Tools" → "Auto configure IO" will automatically assign all enabled IO functions to inputs and outputs of the controller. The assignment of IO functions to inputs and outputs of the controller will follow the same rules and priorities as when using the wizard set-up of the controller from the display. Please refer to the User Guide for the specific controller type to find exact rules and priorities.
4. Check that all enabled IO functions have been assigned to controller IO by checking the status in the "Config" column. It has to say "OK" like shown on the screen below. If it says "Missing", the reason will be that too many IO functions have been enabled compared to the number of IO on the controller.

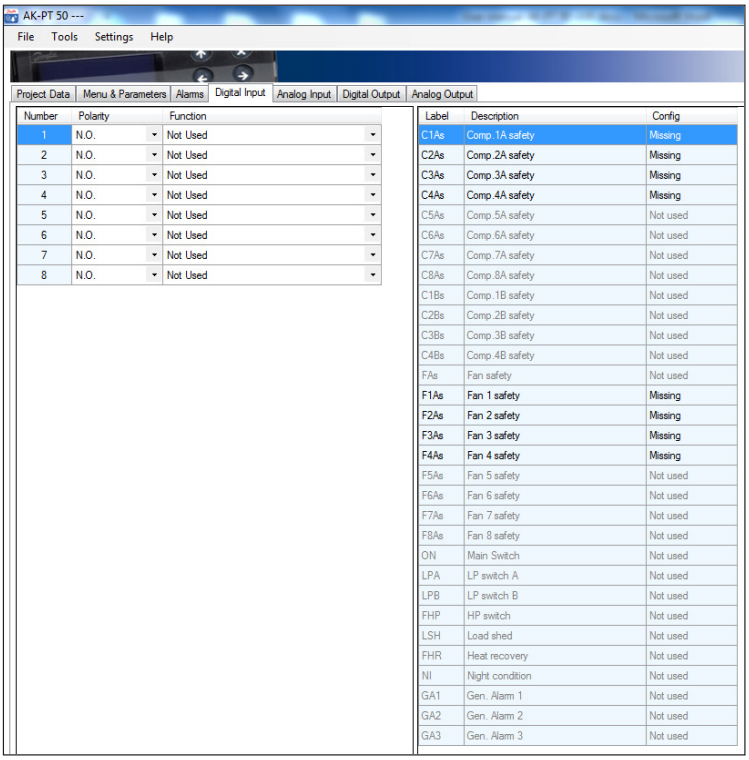
Label	Description	Config
C1As	Comp.1A safety	OK (1)
C2As	Comp.2A safety	OK (2)
C3As	Comp.3A safety	OK (3)
C4As	Comp.4A safety	OK (4)
C5As	Comp.5A safety	Not used
C6As	Comp.6A safety	Not used
C7As	Comp.7A safety	Not used

5. Finally set up the properties for all controller inputs and outputs e.g. sensor types, pressure ranges, NC/NO action of digital inputs and outputs etc.

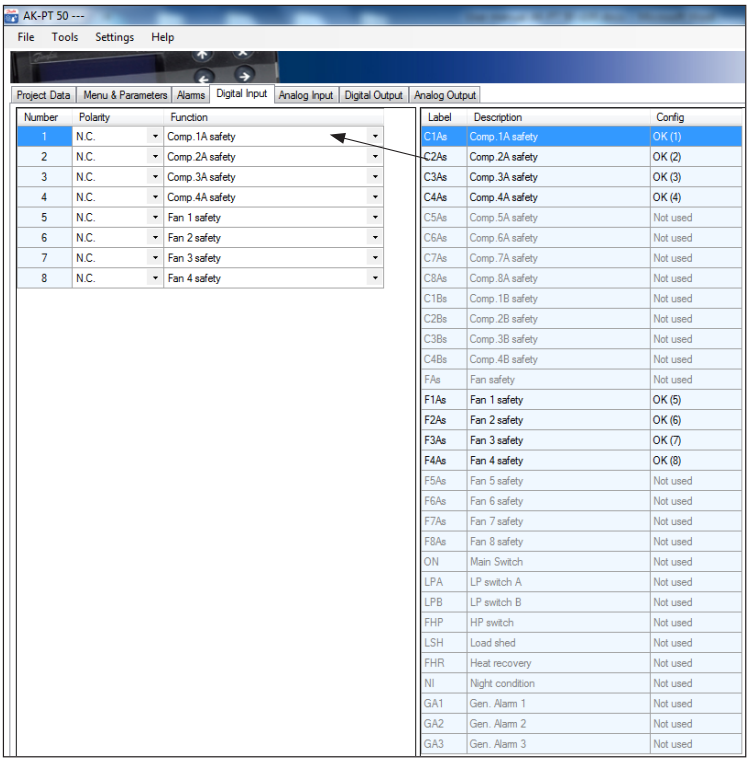
Note: For the AK-PC 351 and AK-PC 572 controllers, all input and output functions are automatically assigned to the controller inputs and outputs and they cannot be changed.

Example:
In below digital input screen,the controller set-up has enabled four compressors safety inputs and four fan safety inputs (shown with black font colour in the digital input screen shown below). The "Config" column shows the status "Missing" as the safety inputs have not yet been assigned to the digital inputs of the controller.

When "Auto configure IO" has been used, the compressor and fan safety inputs have automatically been assigned to the controller digital inputs. The "Config" column now shows the status "OK(x)" where "x" is the number of the assigned digital input.



Digital input screen before auto configure



Digital input screen after auto configuration

Note: Using the function "Auto configure IO" will overwrite any previous assignment of IO functions as well as the properties for the inputs and outputs e.g. pressure transmitter ranges, NO/NC action of digital inputs and outputs.

Note: For AK-PC 351 and AK-PC 572 "Auto configure IO" has no effect on the assignment of IO functions but will only reset the properties of the controller inputs and outputs to default values e.g. pressure transmitter ranges and NO/NC action of digital inputs and outputs.

8. Connect controller to AK-PT

The connection between the AK-PT and an AK-PC 351/AK-PC 551/AK-PC 572/AK-PC 651/AK-PC 651A is done via an MMIMYK gateway.

Please refer to the MMIMYK manual for more details (Litt. No. RS8FP202 - MMIMYK user manual - V 5.1).

8.1 Connect AK-PC 351

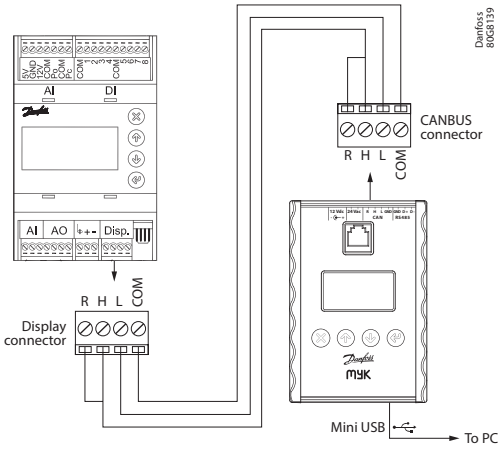
The connection of AK-PC 351 has to be done via the CANBUS terminals on the controller and on the MMIMYK as shown in the drawing to the right.

The MMIMYK gateway is connected to the PC via a mini USB connection. The MMIMYK gets power from the USB.

The MMIMYK gateway is connected to the AK-PC 351 via wires between the CANBUS terminals of the MMIMYK and AK-PC 351.

AK-PC 351 must be powered up.

Remember to terminate the CANBUS connection on the controller and at the MMIMYK by connecting the terminals "R" and "H" on the CANBUS connector.



8.2 Connect AK-PC 551

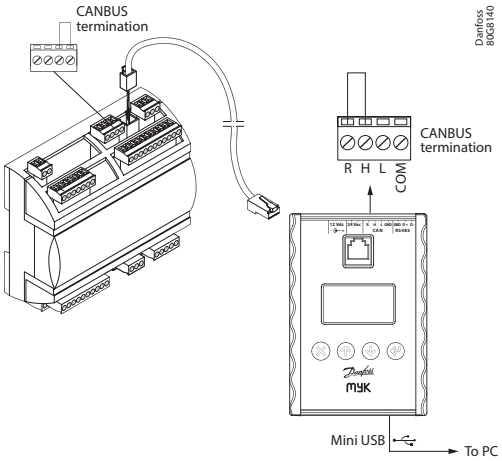
The connection of AK-PC 551 is easily done as shown in the drawing to the right.

The MMIMYK gateway is connected to the PC via a mini USB connection. The MMIMYK gets power from the USB.

The MMIMYK gateway is connected to the AK-PC 551 via RJ11telephone cable (order no. 080G0075).

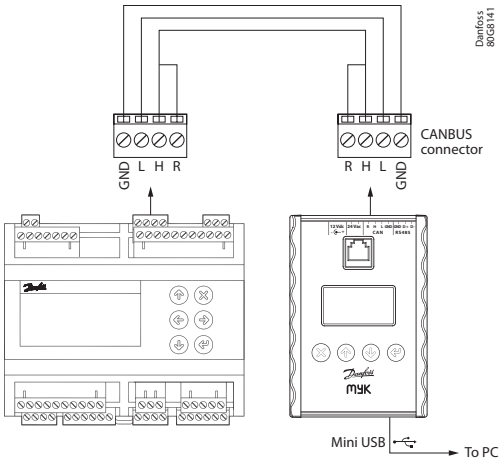
AK-PC 551 must be powered up.
The telephone cable is just plugged into the CAN-RJ connectors (RJ11 plug type) of the MMIMYK and AK-PC 551.

Remember to terminate the CANBUS connection on the controller and on the MMIMYK by connecting the terminals "R" and "H" on the CANBUS connector.



If the telephone cable is not available, AK-PC 551 can be wired to the MMIMYK via the CANBUS connectors.

Remember to terminate the CANBUS connection on the controller and on the MMIMYK by connecting the terminals "R" and "H" on the CANBUS connector.



8.3 Connect AK-PC 572

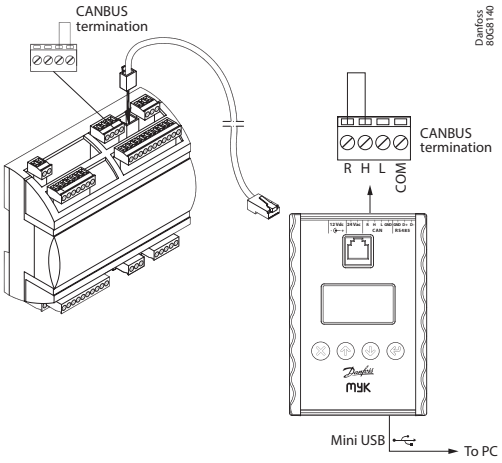
The connection of AK-PC 572 is easily done as shown in the drawing to the right.

The MMIMYK gateway is connected to the PC via a mini USB connection. The MMIMYK gets power from the USB.

The MMIMYK gateway is connected to the AK-PC 572 via RJ11telephone cable (order no. 080G0075).

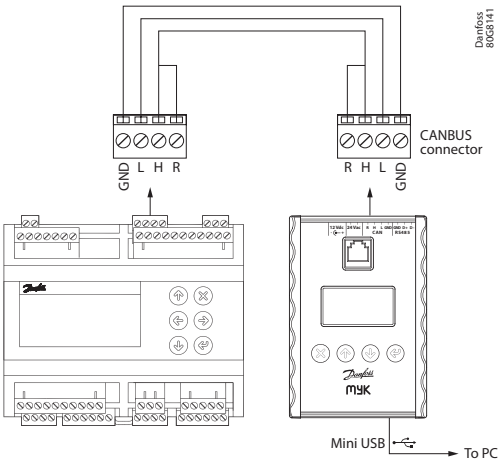
AK-PC 572 must be powered up.
The telephone cable is just plugged into the CAN-RJ connectors (RJ11 plug type) of the MMIMYK and AK-PC 572.

Remember to terminate the CANBUS connection on the controller and on the MMIMYK by connecting the terminals "R" and "H" on the CANBUS connector.



If the telephone cable is not available, AK-PC 572 can be wired to the MMIMYK via the CANBUS connectors.

Remember to terminate the CANBUS connection on the controller and on the MMIMYK by connecting the terminals "R" and "H" on the CANBUS connector.



8.4 Connect AK-PC 651/651A

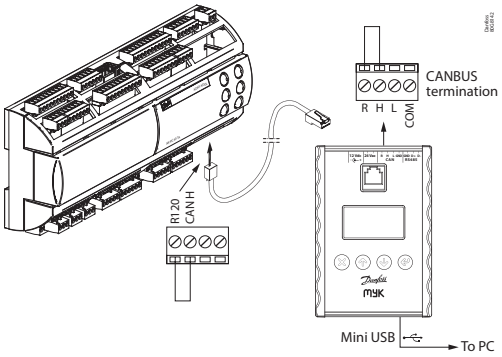
The connection of AK-PC 651/651A is easily done as shown in the drawing to the right.

The MMIMYK gateway is connected to the PC via a mini USB connection. The MMIMYK gets power from the USB.

The MMIMYK gateway is connected to the AK-PC 651/651A via RJ11telephone cable (order no. 080G0075).

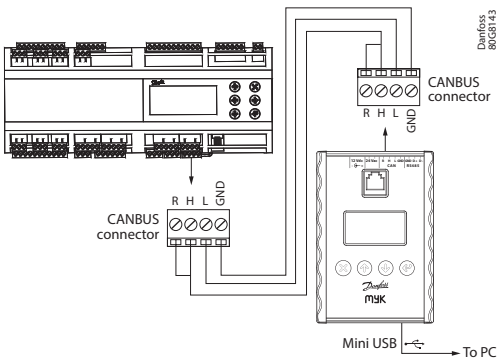
AK-PC 651/651A must be powered up.
The telephone cable is just plugged into the CAN-RJ connectors (RJ11 plug type) of the MMIMYK and AK-PC 651/651A.

Remember to terminate the CANBUS connection on the controller and on the MMIMYK by connecting the terminals "R" and "H" on the CANBUS connector.



If the telephone cable is not available, AK-PC 651/651A can be wired to the MMIMYK via the CANBUS connectors.

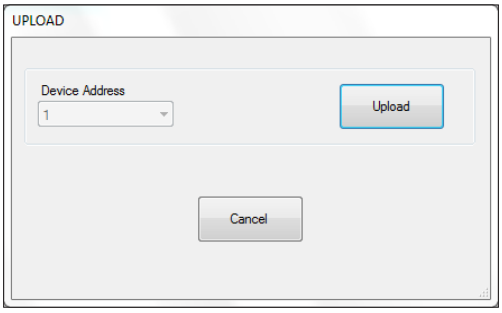
Remember to terminate the CANBUS connection on the controller and on the MMIMYK by connecting the terminals "R" and "H" on the CANBUS connector.



8.4 Check communication

Once the controller has been connected to the AK-PT via the MMIMYK you can check the communication by selecting "Service and test" in the "File" menu.

This will bring up a window for uploading the controller parameters:



Device address
The device address field will show the network address of a controller connected to the AK-PT via the MMIMYK gateway. If the device address shows a value and the "Upload" button is enabled, then the communication is OK.

Note: If the device address field does not show a device address, there can be two reasons:

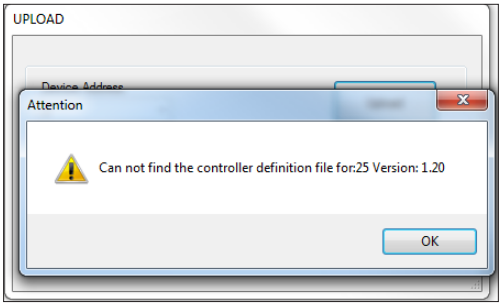
1. **Termination of CANBUS missing**
   The CANBUS connection between the controller and the MMIMYK must be terminated for robust data transfer. Please refer to paragraph "Connect controller to AK-PT" for details on CANBUS wiring and termination.

2. **Wrong baud rate setting in the controller or the MMIMYK**
   The CANBUS baud rate setting in the controller and in the MMIMYK has to be set on the same value. It is recommended to use 50k baud for the most robust communication.

   Check baud rate in the MMIMYK:
   - Disconnect the MMIMYK from all power supply sources (power might be supplied via USB cable and/or via connection to the controller and/or via external power supply).
   - Reconnect power supply to the MMIMYK.
   - Select menu point "CAN settings" in the MMIMYK menu.
   - Select menu point "Baud rate" in the MMIMYK.
   - Check that the baud rate is set at 50K.

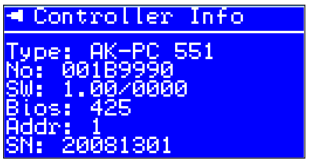
   Check baud rate of controller:
   - Power down the controller.
   - Power up the controller and press the "Escape" and "Enter" buttons simultaneously.
   - After a few seconds the "Bios" menu appears in the display.
   - Select menu point "CAN".
   - Select menu point "Baud rate" and check that it is set at 50K.
   - Leave BIOS menu by pressing "Escape" a couple of times and select menu point "Exit".

Note: If the connected controller type and software version is NOT supported by the AK-PT, a fault message will be shown when pressing the upload button:



In order to solve this issue you must import a controller package file for the controller type and software version in question (refer to the paragraph "Import new controller types"). If you do not have a controller package file for the controller in question, please contact Danfoss. New CPF/CDF files can be found on the Global Product Support site.

Before contacting Danfoss please check the controller type and software version of the controller by navigating to the controller info screen of the controller. Here is an example of a controller info screen from the AK-PC 551:



9. Import new controller types

Released software versions of AK-PC 351, AK-PC 551, AK-PC 572 and AK-PC 651/651A are supported/ pre-installed as part of the installation process.

However, when a new controller type or a new controller software version becomes available you will have to import a new controller package file for the new controller type/software version in question.

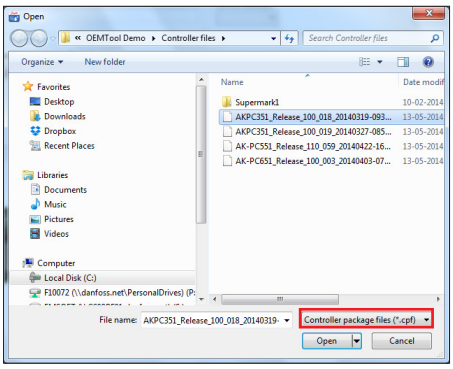
Please contact Danfoss for availability of controller package files for new controller types and/or new software versions. New CPF/CDF files can be found on the Global Product Support site.

The controller package files have the following naming convention:
"AKPC351_Release_100_019_20140327-0856.cpf"
(Controller type = AKPC351, SW version = 1.00, Build no. =19, date for creation = 2014.03.27 and extension type)

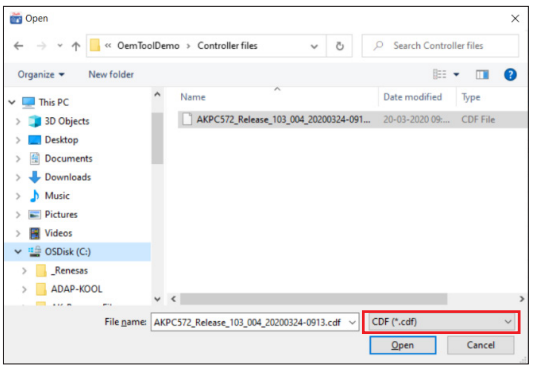
The extension type for AK-PC 572 is .cdf

The first step is to save the controller package files in a directory.

To import a new type of controller please select the menu: "Tools" → "Import controller File" (Ctrl. – I)



.cpf



.cdf

Select the file and file extension "controller package file" or "CDF" and press "Open" – the imported controller type/software version is now supported by the AK-PT.

Once the controller package files have been imported, the OEM software is ready to manage the parameters of the controllers.

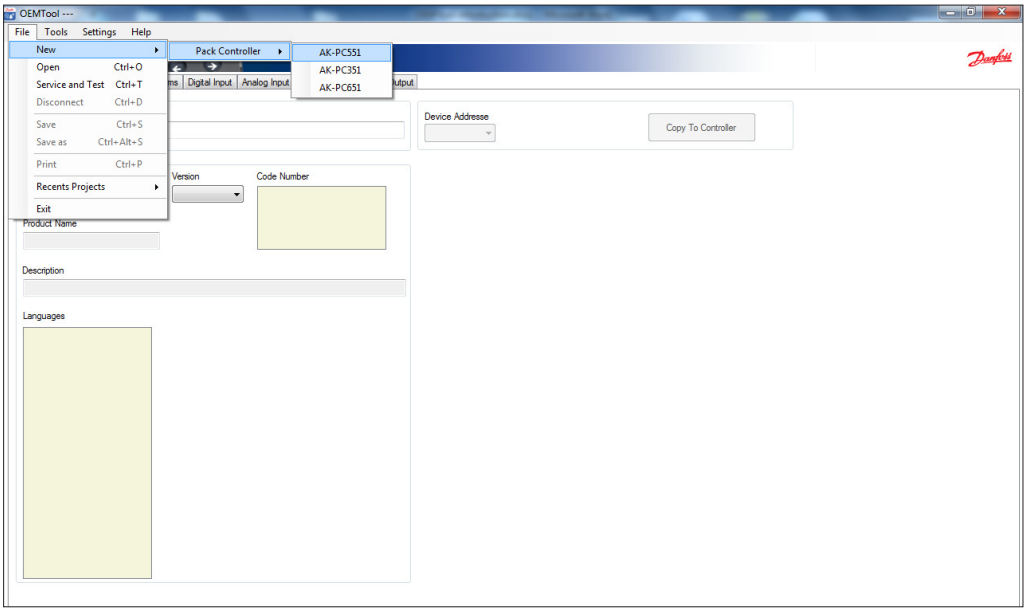
10. Tutorials

10.1 How to create the first controller set-up project

Once the controller package files have been imported, it is possible to manage the parameters offline and online.

To start on a new project select "File" → "New" → "Pack controller" → "Controller type" i.e. AK-PC 551.

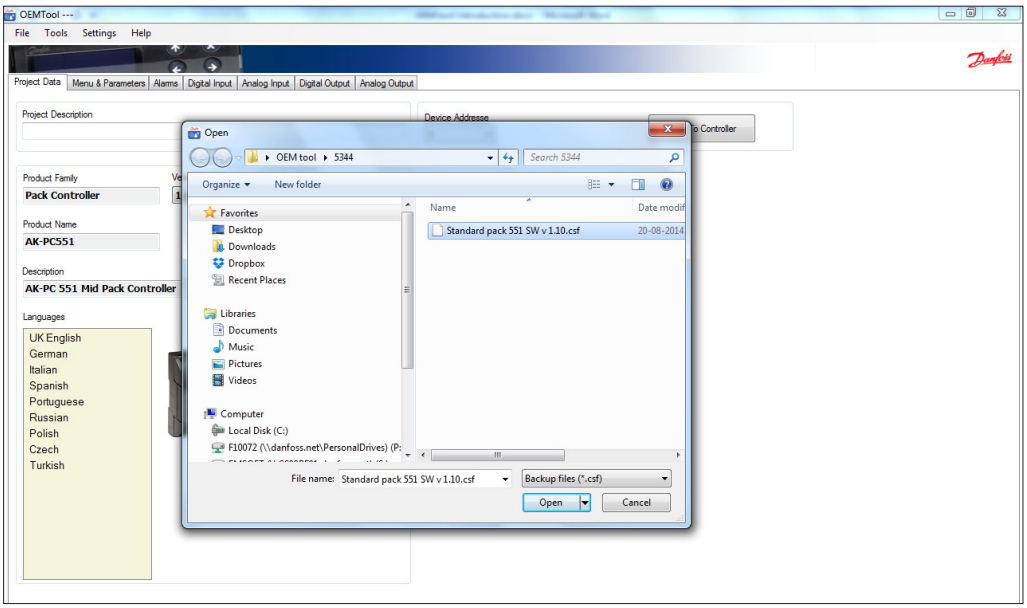
Now the controller type is being loaded into the AK-PT and you are ready to manage the parameter set-up.



10.2 How to edit an existing controller set-up file

To open an existing set-up file select "File" → "Open".

Select the required set-up file via the file explorer - the set-up file is being loaded and you are ready to edit the parameter set-up. Set-up files have the file extension ".CSF" and it is recommended to save set-up files with a name including controller type and SW version, which makes it easier to identify the correct file.



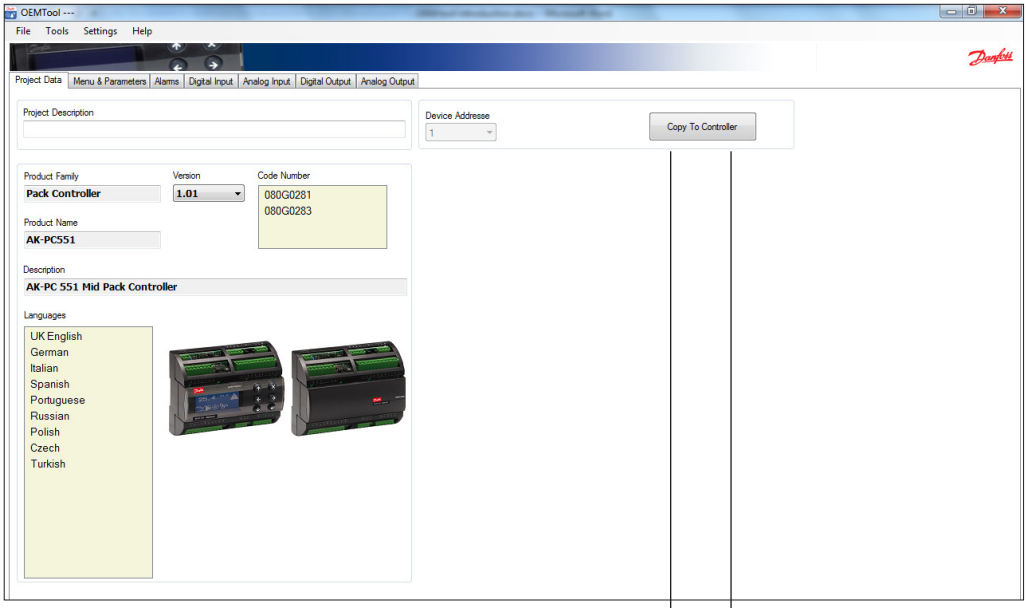
10.3 How to program one or multiple controllers from existing set-up file

To open an existing set-up file select "File" → "Open".

Select the required set-up file via the file explorer - the set-up file is being loaded and you are ready to program the parameter set-up into a controller.

Connect the AK-PC pack controller to the AK-PT – please refer to the paragraph "Connect controller to AK-PT".

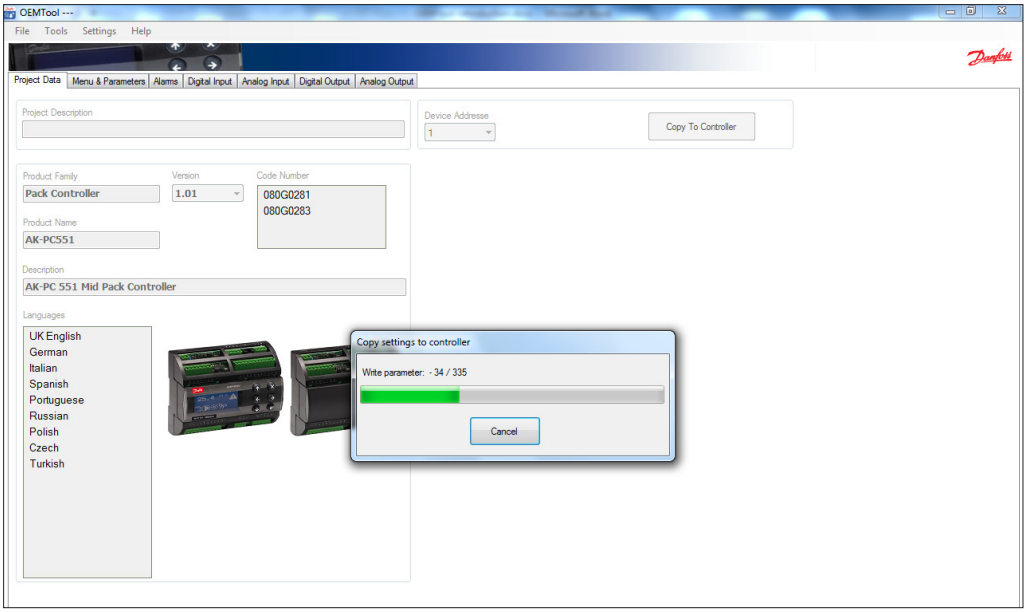
Note: Do not start the programming before the main screen is shown on the controller. If the controller has not been programmed before, it should say "No application configured".



If the connected controller complies with the controller type and SW version of the loaded set-up file, the device address field will show the network address of the connected controller and the "Copy to controller" button will be enabled:

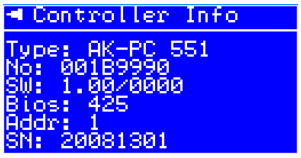
If the connected controller DOES NOT comply with the controller type and SW version of the loaded set-up file, the device address field will NOT show any network address and the "Copy to controller" button will be disabled:

If the connected controller complies with the set-up file, you can easily program the controller by pressing the "Copy to controller" button – now the settings from the set-up file are being transferred to the controller:



Once all parameters have been copied to the controller, you can disconnect the controller and connect the next controller that needs to be programmed.

Note: If the network address does not show any network address and the "Copy to controller" button is disabled, please check the software version of the controller by navigating to the controller info screen on the controller – here an example from an AK-PC 551:

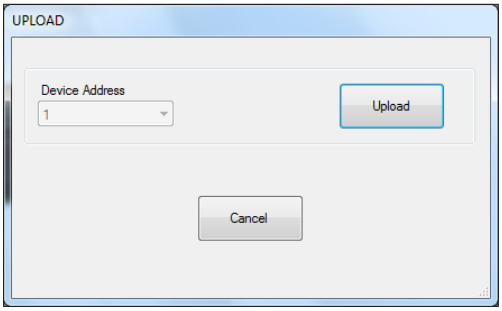


If the software version of the controller does not comply with the software version in the set-up file, you will either have to make a new set-up file for the correct software version or you will have to update the controller software to the same version as the set-up file.

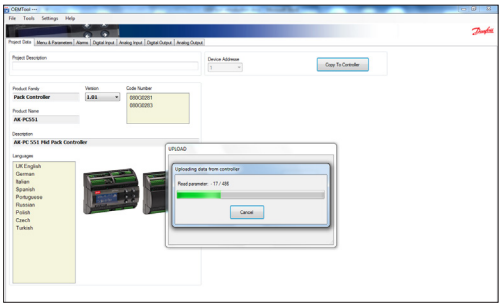
10.4 How to set up and service a controller online

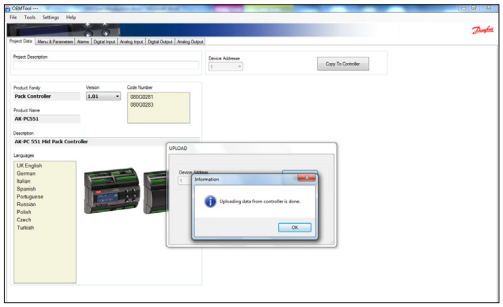
Connect the AK-PC pack controller to the AK-PT – please refer to the paragraph "Connect controller to AK-PT".

To make an online connection to the controller please select "File" → "Service & Test". This will bring up an upload window:



Press the "Upload" button and the AK-PT will start to read all data from the connected controller:

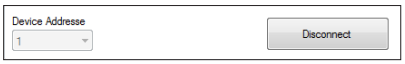




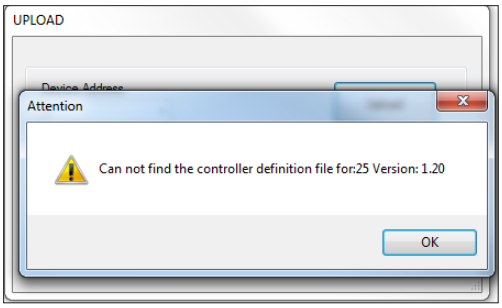
Once all parameters have been read, the online readings and settings of the controller are presented and the connection status indicator in the lower right corner of the screen shows that the AK-PT is working online with a controller and that data is being constantly updated:

You can always save the current set up of an online controller by selecting "File" → "Save" or "Save as".

When you are finished working online with a controller, you can disconnect the controller connection by selecting "File" → "Disconnect" or by pressing the "Disconnect" button on the "Project data" screen. You can then continue to work offline with the uploaded controller settings.



Note: If the connected controller type and software version is NOT supported by the AK-PT, a fault message will be shown when pressing the upload button:



In order to solve this issue you must import a controller package file for the controller type and software version in question (refer to the paragraph "Import new controller types"). If you do not have a controller package file for the controller in question, please contact Danfoss. New CPF/CDF files can be found on the Global Product Support site.

Before contacting Danfoss please check the controller type and software version of the controller by navigating to the controller info screen of the controller – here an example of a controller info screen from an AK-PC 551:

10.5 How to check input and output signals on an online controller

Make an online connection to a controller as described in the previous tutorial "How to set up and service a controller online".

Once the connection has been established, it is easy to check the status of inputs and outputs.

Note: If inputs and outputs have just been configured, the parameter "Main switch" (in the Start/Stop menu) must be set to "ON" in order to get correct readings.

Digital inputs:
Navigate to the "Digital input" tab and check the actual status of the digital input signals in the table on the left side of the screen:

Number	Polarity	Function	Value
1	N.C.	Comp.1A safety	ON
2	N.C.	Comp.2A safety	ON
3	N.C.	Comp.3A safety	ON
4	N.C.	Comp.4A safety	ON
5	N.C.	Fan safety	ON
6	N.O.	Not Used	OFF
7	N.O.	Not Used	OFF
8	N.O.	Not Used	OFF

Analogue inputs – sensor signals
Navigate to the "Analog input" tab and the check actual status of the analogue input signals in the table on the left side of the screen:

Number	Type	Function	Min	Max	Calibration	Value
1	AKS32R	PoA Suction pres.	-1.00	12.00	0.00	3.77
2	AKS32R	Pc Condenser pres.	-1.00	34.00	0.00	11.86
3	PT1000	Sc3 Outdoor temp.	-50.0	200.0	0.0	24.6
4	PT1000	Not Used	-500	2000	0	*****
5	NO	Not Used	0	0	0	*****
6	NO	Not Used	0	0	0	*****
7	NO	Not Used	0	0	0	*****
8	NO	Not Used	0	0	0	*****

Pressure signals are read out in bar and temperature signals in degree Celsius.
Defective or not used sensor values will be shown as stars.

Digital outputs:
Navigate to the "Digital output" tab and check the actual status of the digital output signals in the table on the left side of the screen:

Number	Polarity	Function	Override Mode	Value
1	N.O.	Comp.1A	ON	ON
2	N.O.	Comp.2A	ON	ON
3	N.O.	Comp.3A	AUTO	OFF
4	N.O.	Comp.4A	AUTO	OFF
5	N.O.	Fan 1/VSD	OFF	OFF
6	N.O.	Fan 2	ON	OFF
7	N.O.	Fan 3	AUTO	OFF
8	N.O.	Fan 4	AUTO	OFF

The actual status of the digital outputs is shown in the "Value" column.

It is possible to make a manual override of digital outputs by setting the relay status in the "Override Mode" column.

Analogue outputs:
Navigate to the "Analog output" tab and check the actual status of the analogue output signals in the table on the left side of the screen:

Number	Type	Function	Override Mode	Override Value	Value
3	0-10 V	Comp.1A speed	MANUAL	20.0	20.0
4	0-10 V	Fan speed	AUTO	0.0	0.0

The actual status of the analogue outputs is shown in the "Value" column.

It is possible to make a manual override of analogue output signals by setting the override mode to manual and then set an override value. In the above example, the analogue output for compressor speed is set in manual mode with an override value of 20%. The override value is set in percentage of defined output signal which means that for 0 – 10 V signal, 20% correspond to an output voltage of 2 V.

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