

ENGINEERING
TOMORROW

Danfoss

User Guide

KoolProg®

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1. Introduction

Configuring and testing the Danfoss electronic controllers has never been as easy as with the new KoolProg PC software.

KoolProg brings all your controller programming needs into one software. Configure controllers online or offline, perform mass programming, update controller firmware, and monitor control status in real-time — saving R&D and production teams valuable time in development, programming, and testing.

Supported Danfoss products:

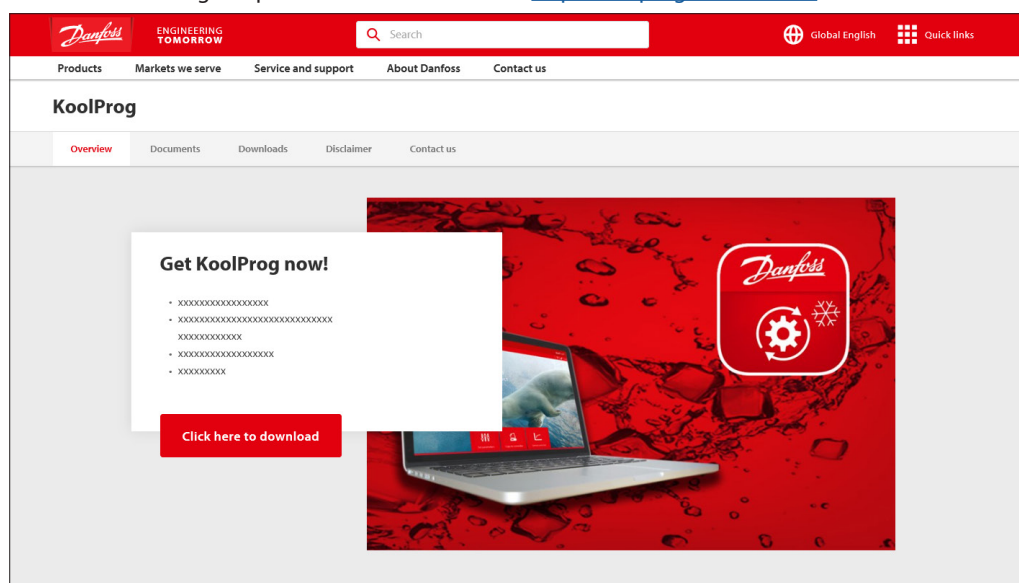
ETC 1H, EETc/EETa, ERC 111/112/113, ERC 211/213/214,
EKE 1A/1B/1C/1D, AK-CC55, AK-CC25, EKF 1A/2A, EKE 100/110, EKC 22x.

The following instructions will guide you through the installation and first time usage of KoolProg®.

2. KoolProg software update

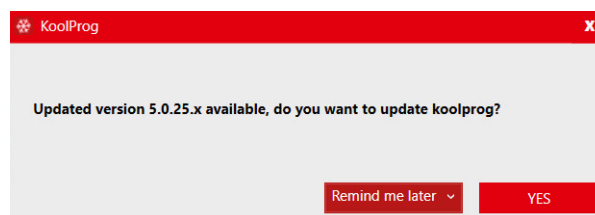
a. Downloading .exe file

Download KoolProgSetup.exe file from the location: <http://koolprog.danfoss.com>



b. Auto update:

When KoolProg is opened, a pop-up notification shown below will automatically appear if a newer version is available on the server.



On clicking the 'Yes' button, the AutoUpdate setup will be triggered and begin downloading the installation package.

Note: This feature is available only in KoolProg version 5.4.0 and above

3. System requirements

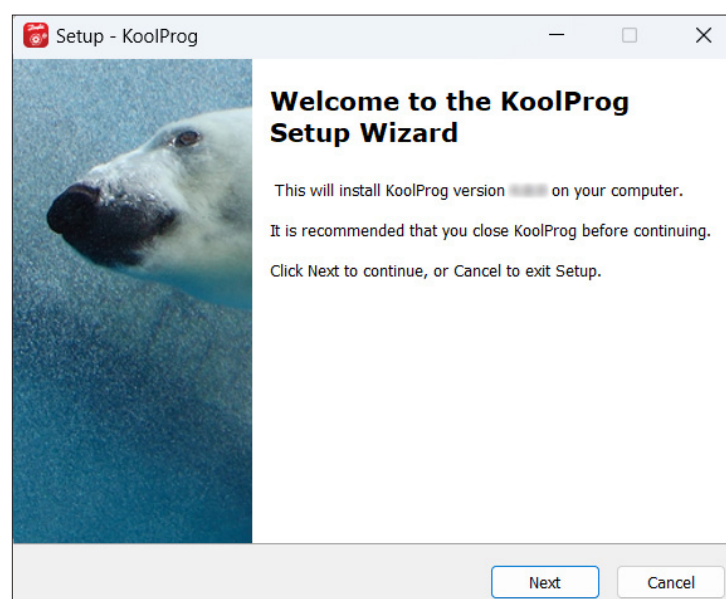
This software is intended for a single user and recommended system requirements as below.

OS	Windows 10 or Windows 11, 64 bit
RAM	8 GB RAM
HD Space	200 GB and 250 GB
Required software	MS Office 2010 and above
Interface	USB 3.0

Macintosh operating system is not supported.
Running the set-up directly from a Windows server or network file server is not recommended.

4. Installing software

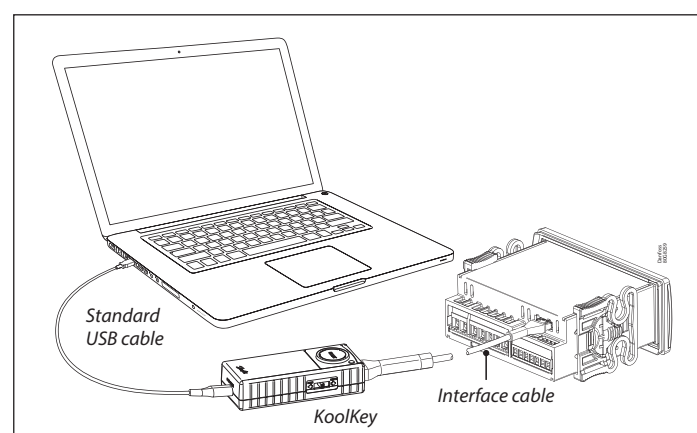
- Double click on the KoolProg® set-up icon.
 Run the installation wizard and follow the on-screen instructions to complete the KoolProg® installation.



Note: If you encounter a "Security warning" during installation, please click on "Install this driver software anyway".

5. Connection with controllers

Fig 1: EET, ERC21x and ERC11x controllers using KoolKey (code no. 080N0020) as a Gateway



1. Connect the KoolKey to the PC's USB port using standard USB cable.
2. Connect the controller to KoolKey using an interface cable of respective controller.

Fig 2: Connection for AK-CC25 using KoolKey as USB/RS 485 gateway

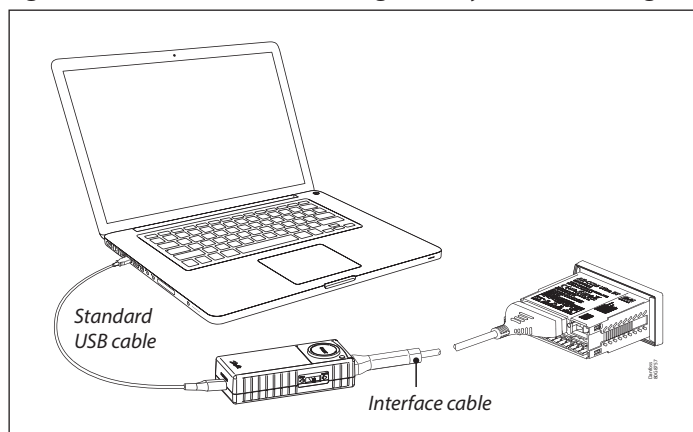
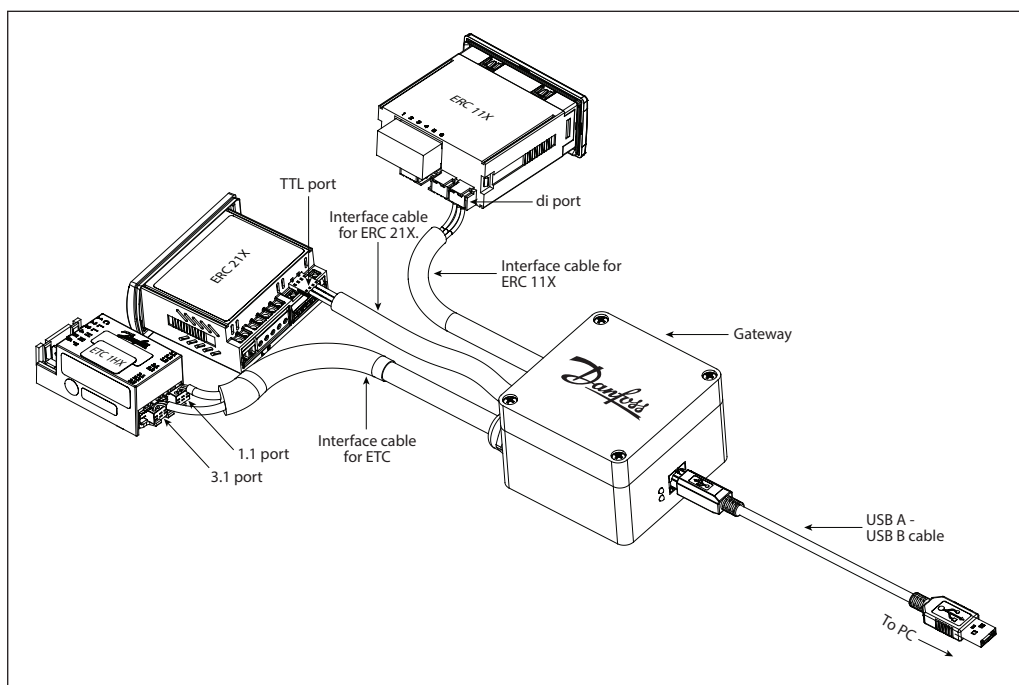


Fig 3: ERC11x, ERC21x and ETC1Hx using Danfoss Gateway (code no. 080G9711)



1. Connect the USB cable to the PC's USB port.
2. Connect the controller using respective cable.

CAUTION: Please ensure that only one controller is connected at any time.

For more details on programming setting file to controller using KoolKey and Mass Programming Key please refer following links: [KoolKey \(EKA200\)](#) and [Mass Programming Key \(EKA201\)](#).

Fig 4: Connection for EKE using interface type MMIMYK (code no. 080G0073)

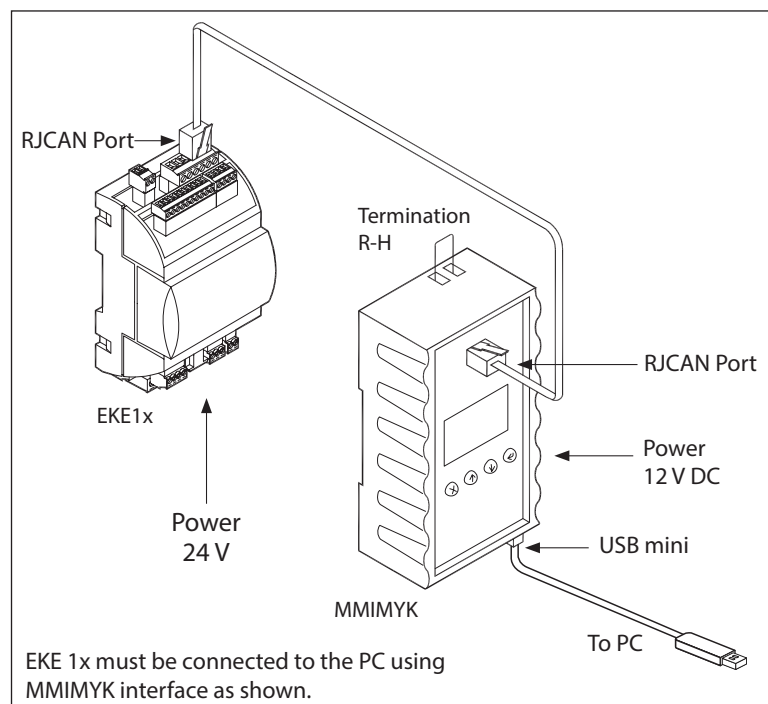


Fig 5: Connection for AK-CC55 using interface type MMIMYK (Code No. 080G0073)

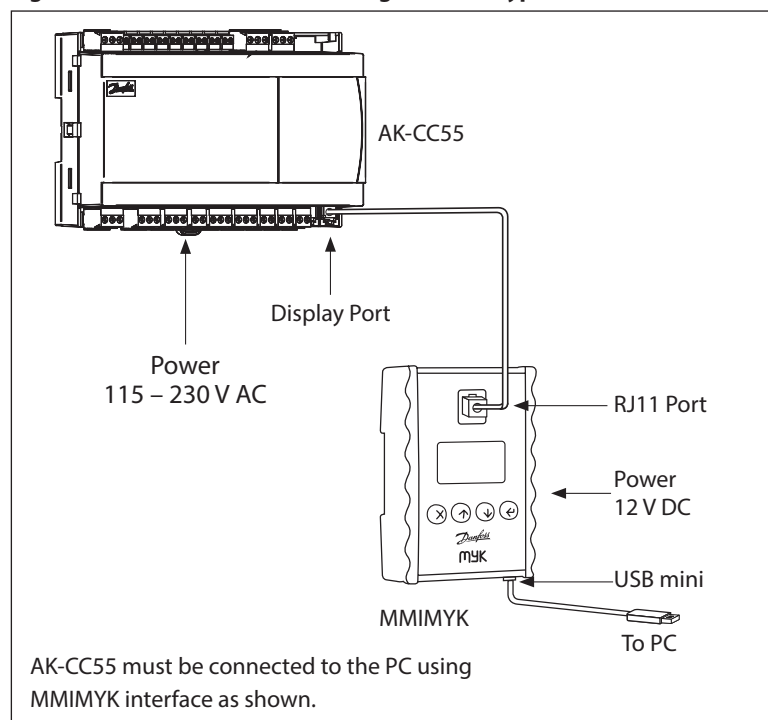


Fig 6: Connection for EKF1A/2A using KoolKey as a Gateway.

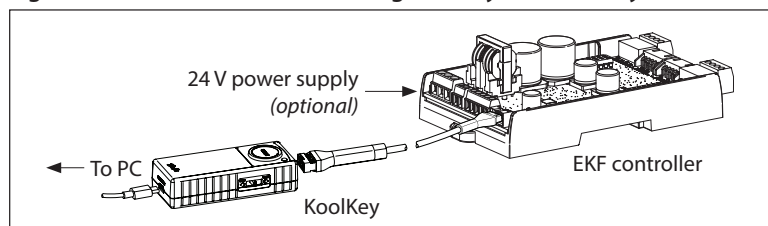


Fig 7: Connection for EKC 22x using KoolKey as Gateway

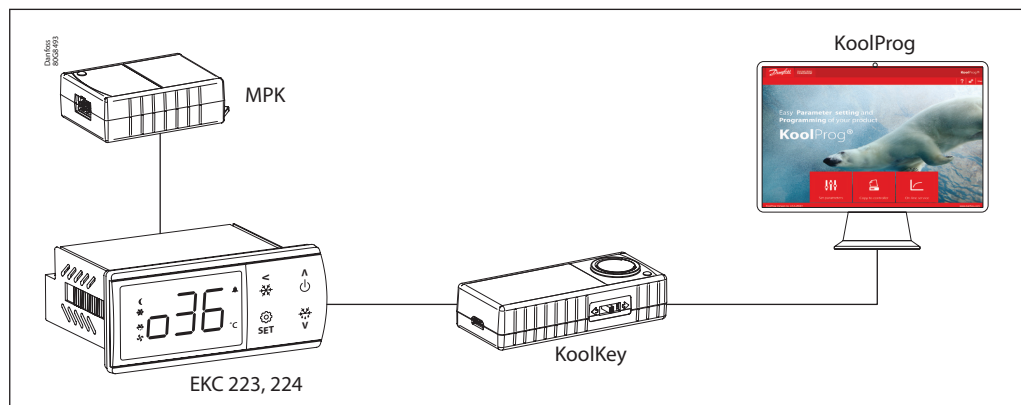
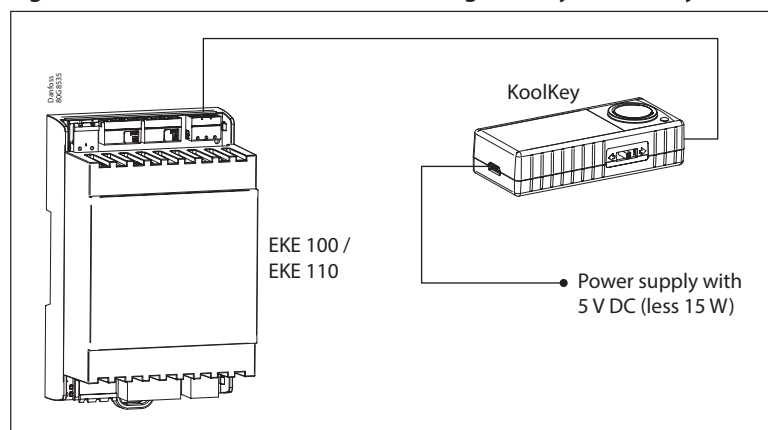
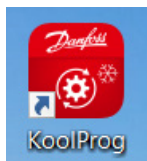


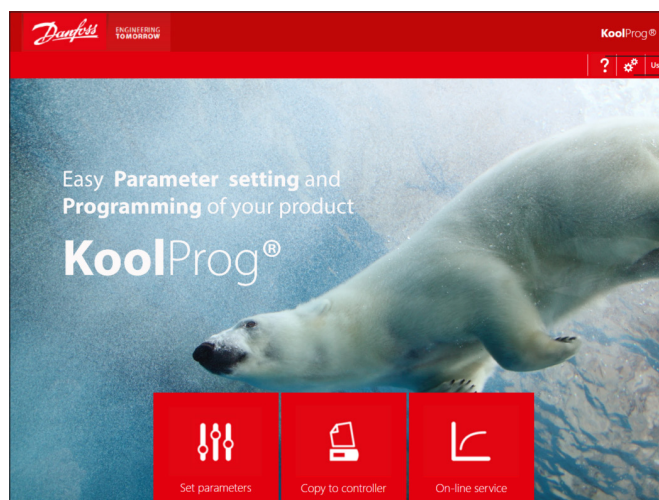
Fig 8: Connection for EKE 100/EKE 110 using KoolKey as Gateway



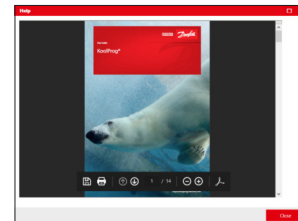
6. Starting the program



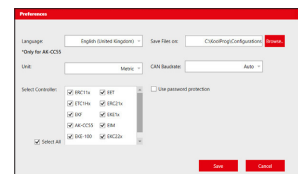
Double click on the desktop icon to launch the KoolProg application.



Help



Preferences

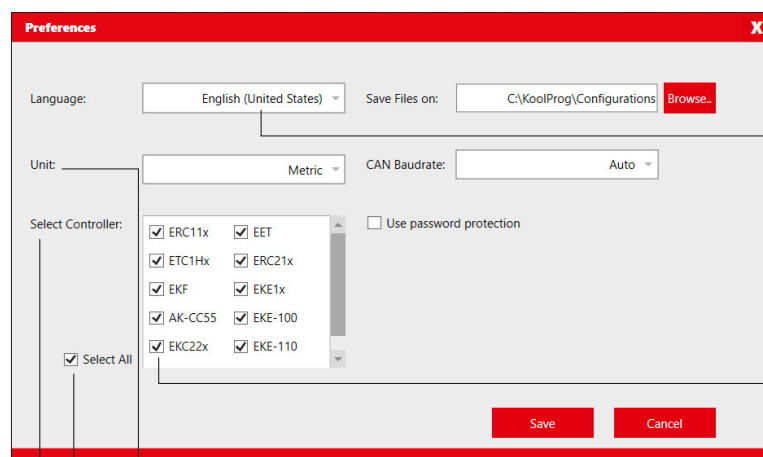


The program's features

To create new parameter setting files either by importing them from the controller or off-line.

To program the parameter setting file and upgrade firmware in the connected controller.

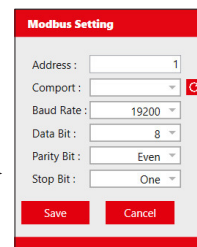
To edit settings/trend graphs of the controller parameters in real-time.



Choose the preferred language

Select the units you prefer to work with: Metric (°C and bar), Imperial (°F and PSI)

When 'Select All' checkbox is enabled, it will select all the controllers in the controller group.



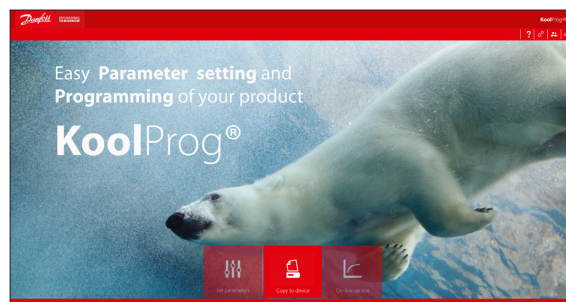
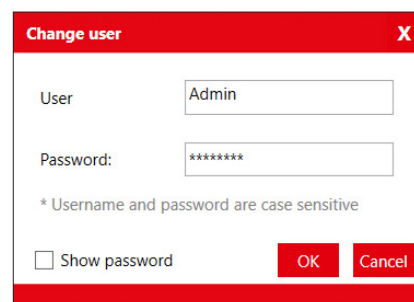
Note: The Modbus settings window appears only when EKE 100 is selected.

All controller types are preselected by default. To minimize connection time and ensure accurate communication, choose only the specific controller type you are connecting to.

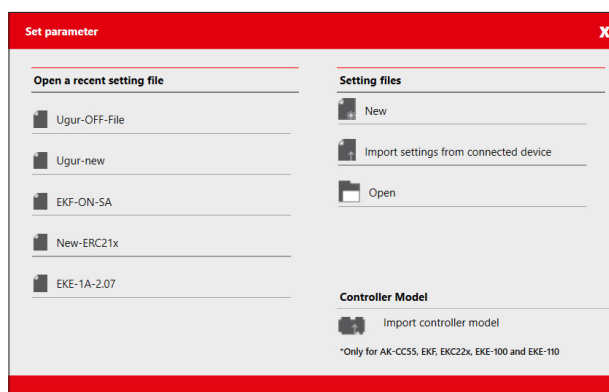
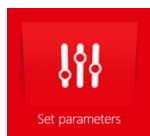
Accessibility

Users with a password have access to all features.

Users without a password have limited access and only be able to use the 'Copy to controller' feature.



7. Set parameters



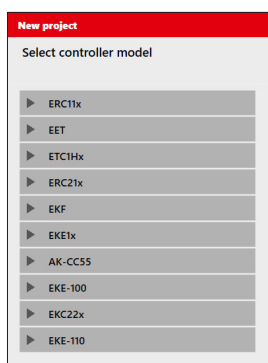
This feature lets you configure parameter settings for your application.

Use the icons below 'Setting files' to

- create a new configuration offline
- import settings from a connected controller
- open an already saved project.

Recently created projects are listed under 'Open a recent setting file'.

New

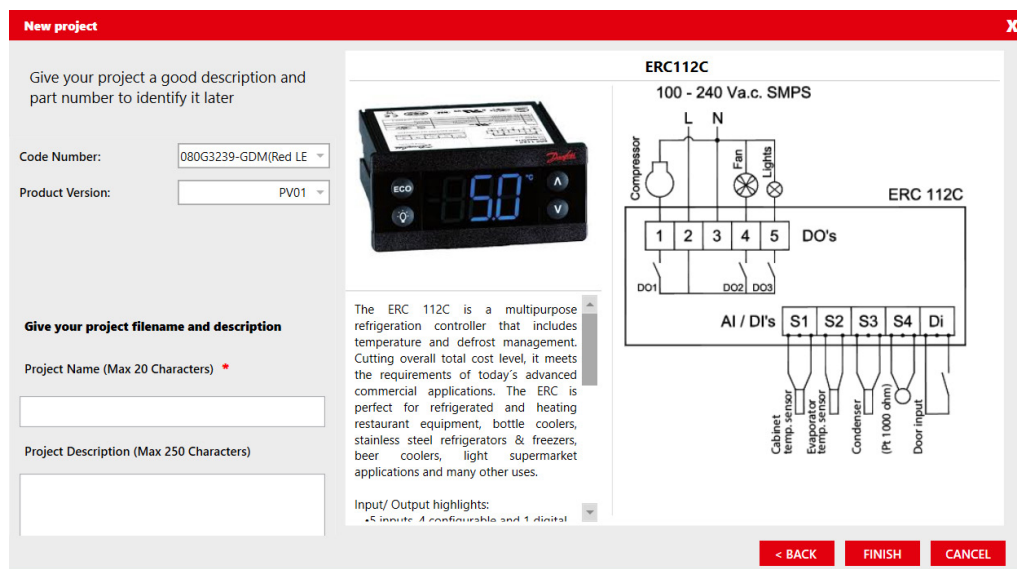


Create a new project by selecting:

- Controller type
- Part number (code number)
- PV (product version) number
- SW (software) version

Once you have selected a file, you need to name the project.

Click 'Finish' to proceed to view and set parameters.



Note: Only standard code numbers are available to choose from in the "Code Number" field. To work off-line with a non-standard code number (customer specific code number), use one of the following two methods:

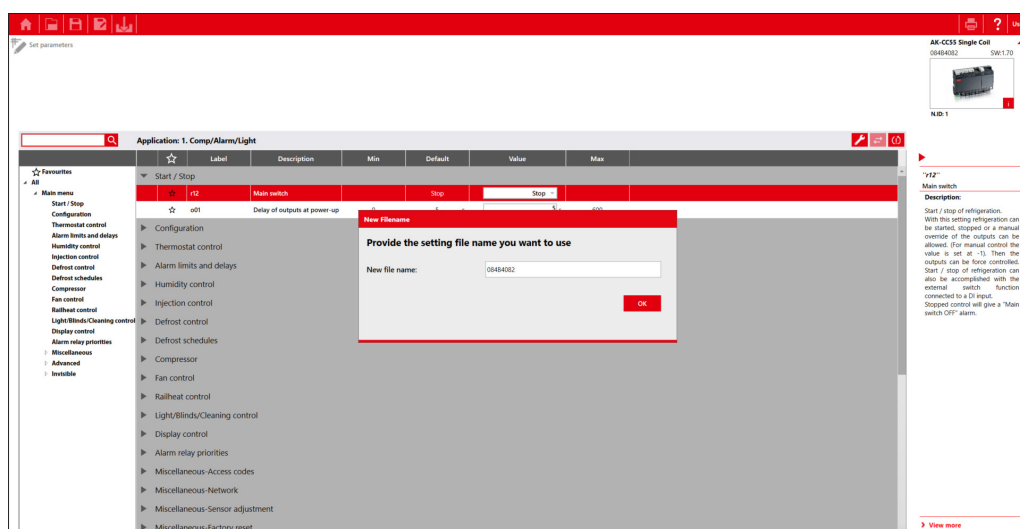
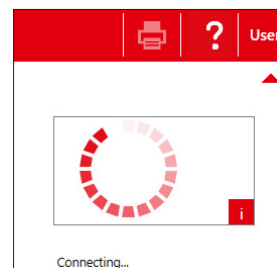
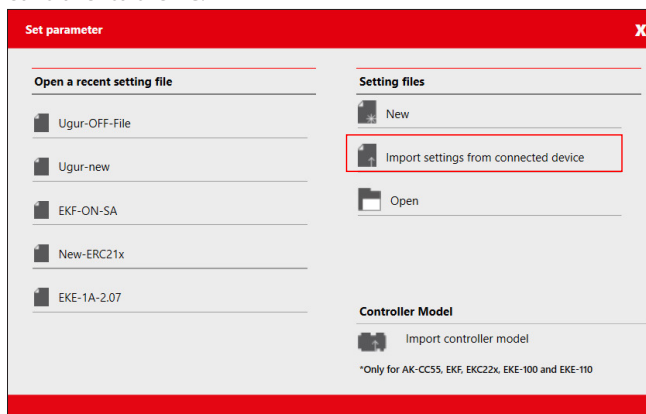
1. Connect the controller of same code number with KoolProg using Gateway, and use "Import settings from Controller" to create a configuration file from it.
2. Use "Open" feature to open an existing locally saved file on your PC of same code number and create a new file from it.

The new file, saved on your PC locally, can be accessed offline in future without having to connect the controller.

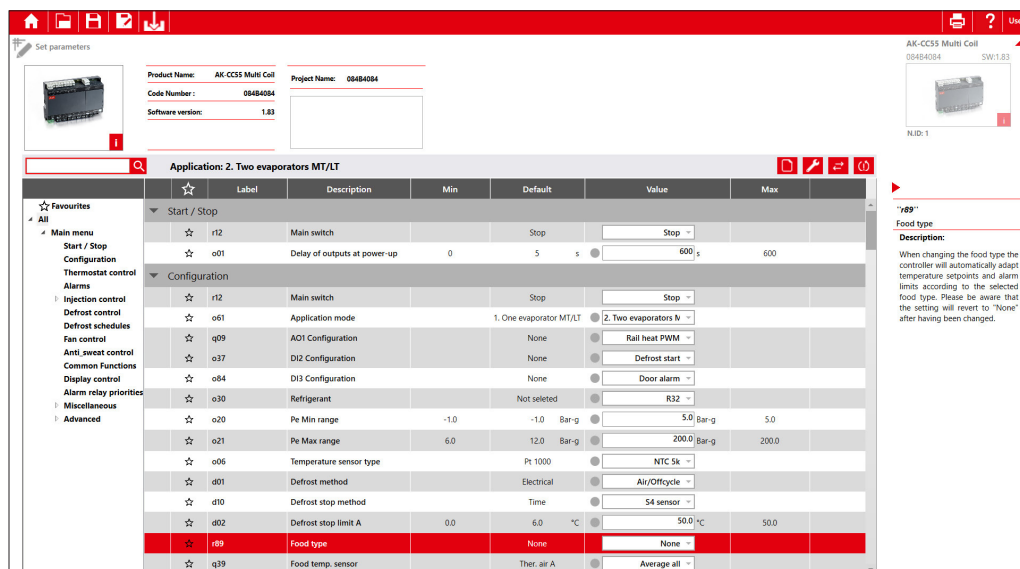
Import settings from controller

Allows you to import a configuration from a connected controller to KoolProg and to modify the parameters offline.

Select "Import settings from controller" to import all parameters and the details from the connected controller to the PC.

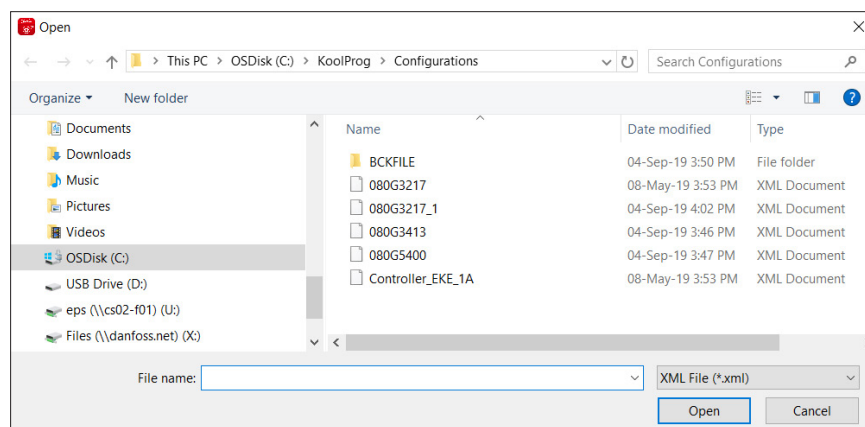


After "Import completed", save the imported setting file by providing the file name in the pop-up message box.



Now the parameter settings can be worked upon offline and can be written back to the controller by pressing "Export" . While working offline, the connected controller is shown grayed out and changed parameter values are not written to the controller until the export button is pressed.

Open





The "Open" command lets you open setting files already saved to the computer. Once the command is clicked, a window will appear with a list of saved setting files.

All projects are stored here in the folder: "KoolProg/Configurations" by default. You can change the default file saving location in "Preferences" .

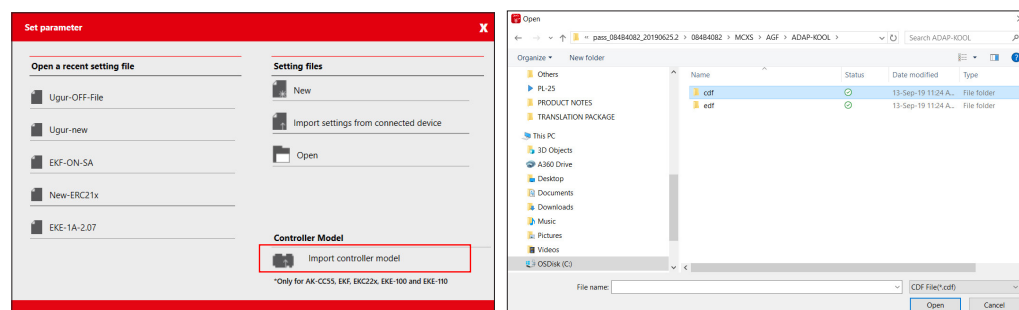
You can also open the setting files you have received from another source and saved in any folder using the browse option. Please note that KoolProg supports multiple file formats (*xml*, *cbk*) for different controllers. select the appropriate setting file format of the controller you are using.

Note: the *.erc/.dpf* format files of the ERC/ETC controller are not visible here. An *.erc* or *.dpf* file saved on your PC can be opened in one of the following ways:

1. Select "New Project" and go all the way to the Parameter list view of the same controller model. Select the Open button  to browse and open the *.erc/.dpf* file on your PC.
2. Select "Upload from controller" if you are connected to the same controller on-line and go to the parameter list view. Select Open button  to browse the desired *.erc/.dpf* file and view it in KoolProg.
3. Select "Open" to open any other *.xml* file of the same controller, reach the parameter list view screen, and there select the Open button to browse and select the *.erc/.dpf* file to view and edit these files.

Import controller model (only for AK-CC55, AK-CC25, EKF, EKC 22x, EKE 100 and EKE 110):

This allows you to import the controller model (*.cdf*) offline and generate a database in KoolProg. This will allow you to create a setting file offline without having the controller connected to KoolProg. KoolProg can import the controller model (*.cdf*) saved to the PC or any storage device.



Set parameters -
continued

Info

Headline

- Home:
- Open:
- Save:
- Save as:
- Export:

The "Home" command will take you back to the Start Menu.
The "Open" command lets you open an existing project.
The "Save" command lets you save all the changes in the active project.
The "Save as" command allows you to save your controller settings as a new project.
This command copies the parameter settings to the connected controller.

Informational Photos

The project's data is shown on the left.
The controller the program is connected to is shown on the right.

i = Controller information.

If the data are identical, these can then be transmitted to the controller.
If they are **not** identical, then these cannot be transmitted. A warning message pops up.

Label	Description	Min	Default	Value	Max
r12	Main switch		Stop	Stop	
o01	Delay of outputs at power-up	0	5	600	600
r12	Main switch		Stop	Stop	
o01	Application mode		1. One evaporator MT/LT	2. Two evaporators N	
q09	AO1 Configuration		None	Rail heat PWM	
o37	D12 Configuration		None	Defrost start	
o04	D13 Configuration		None	Door alarm	
o30	Refrigerant		Not selected	R32	
o20	Pe Min range	-1.0	-1.0	5.0	5.0
o21	Pe Max range	6.0	12.0	200.0	200.0
o06	Temperature sensor type		PT 1000	NTC 5k	
d01	Defrost method		Electrical	Air/Offcycle	
d10	Defrost stop method		Time	S4 sensor	
d02	Defrost stop limit A	0.0	6.0	50.0	50.0
r09	Food type		None	None	
q39	Food temp. sensor		Ther. air A	Average all	

By clicking the 'Print' icon, you can take print of the parameters in the active project.

Arrow Up/Down

By clicking the arrow, you can hide the two photos and display more parameters in the window. Clicking it again causes the photos to re-appear.

Factory reset

This command will reset the project/controller values to default factory settings.

Arrow Left/Right

By clicking the arrow, you can hide the description of the selected parameters. Clicking it again causes the description to re-appear.

View more

This command gives the complete technical description of the controller.

Convert setting files

(only for AK-CC55 and ERC 11x):
To convert setting files from one SW version to another SW version of same controller type.

Quick set-up wizard (only for AK-CC55):

Helps to set up the controller quickly by configuring a few critical parameters and starting the system.

Comparison settings feature

Allows you to compare file value and value of the same parameter in controller.

Parameter settings field

Dot Symbol

A dot symbol will appear in front of a value if it has been modified and is no longer identical to its factory default setting.

Hint - Search Function

You can search for and display a specific parameter with the search function.
Type in the first few letters of the name of the parameter and click "Search".

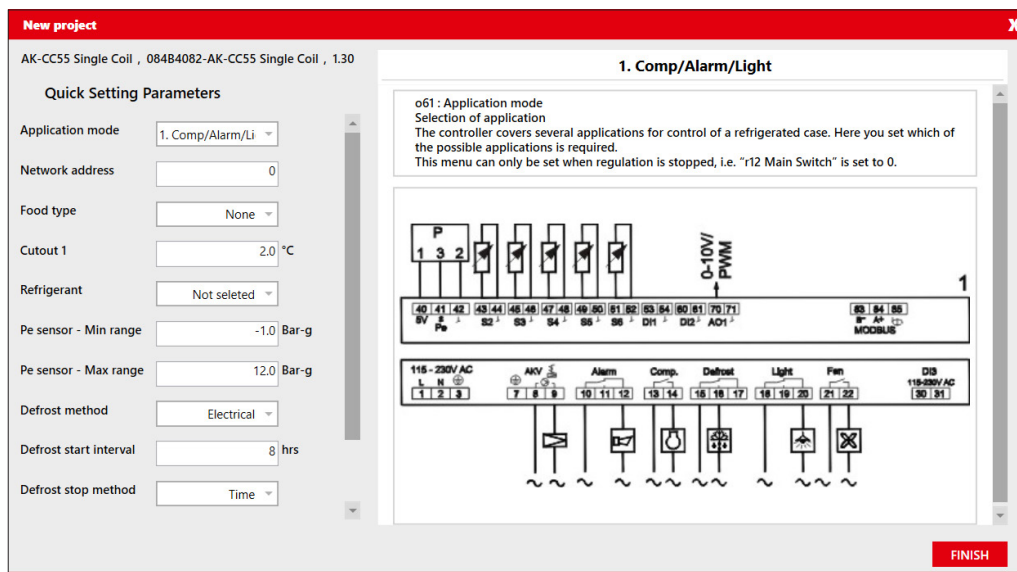
Favourites

You can select a number of parameters by ticking the ones you want in the "stars" column.

Afterwards they will be visible in the "Favourites" folder (first column at the top).


Quick set-up wizard (only for AK-CC55, AK-CC25 and EKC 22x):

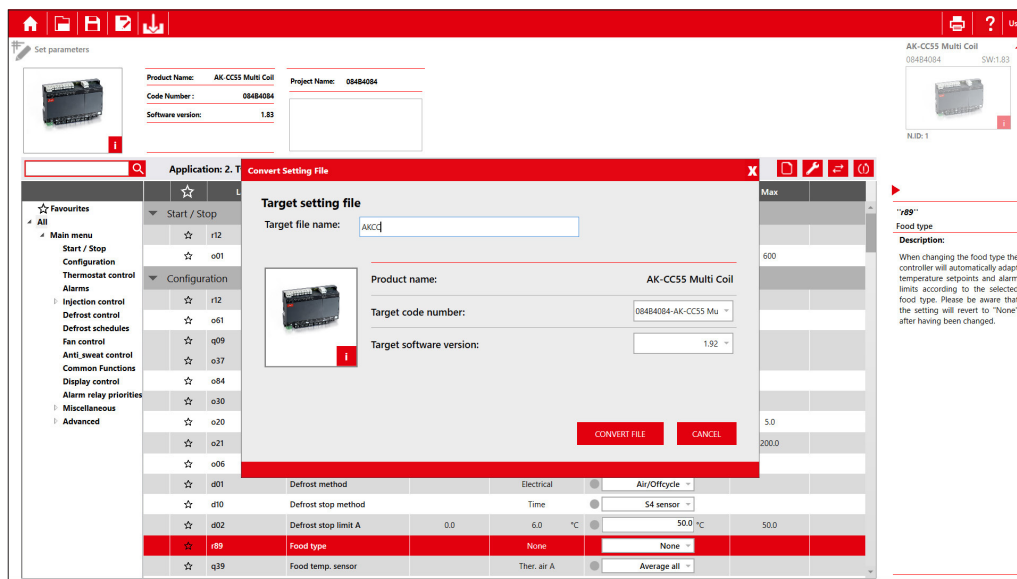
The user can run the quick set-up both off-line and on-line to set up the controller for the required application before moving on to the detailed parameter settings.



Convert setting files (only for AK-CC55 and ERC 11x):

The user can convert the setting files from one software version to another software version of same controller type and can convert settings from both ways (lower to higher SW version and higher to lower SW version).

1. Open the setting file which needs to be converted in KoolProg under "Set parameter".
2. Click on convert setting .
3. Select the project name, code number and SW version / Product version of the setting file that needs to be generated and click OK.
4. A pop-up message with summary of conversion will be displayed at the end of conversion.
5. Converted file is displayed on the screen. Any parameters with orange dot indicates that the value of that parameter is not copied from the source file. It is suggested to review those parameters and make the necessary changes before closing the file, if required.



Comparison settings (applicable for all controllers except ETC1Hx and AK-CC25):

This feature allows users to compare controller parameter settings with a reference project or parameter file. It is especially useful for verifying that the correct settings have been copied to the controller as part of a quality check.

Steps to Compare Settings with a Reference offline Project or Parameter File:

1. Connect the controller whose settings need to be verified.
2. Open the project or parameter file against which the controller settings will be compared.
3. Click the Compare Settings icon in the top-right corner.

KoolProg will compare all parameter settings and generate a report highlighting any differences.

If no changes are detected, a pop-up message will appear:

'The project file has no changes compared with the controller settings file.'

Additionally, the Comparison Settings feature is available under 'Online Services', where it compares controller settings with the default values of the same parameters.

Application: 1. One comp.

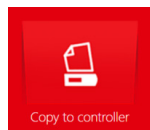
Comparison report

Label	GroupName	Parameter Name	Min	Max	File Value	Controller Value
q09	Configuration	AOT Configuration			Antisweat PWM	None
o02	Configuration	DH Configuration			Door function	Door alarm
o06	Configuration	Temperature sensor type			PTC 1000	Pt 1000
A13	Alarms	High alarm limit 1	-50.0	50.0	10.00	8.00
A14	Alarms	Low alarm limit 1	-50.0	50.0	10.00	-30.00
A03	Alarms	Alarm delay A	0	240	20	30
A12	Alarms	Alarm delay pull down A	0	240	24	90
F06	Fan control	Fan period time	1	30	30	5
o85	Anti_sweat control	Antisweat control mode			Day/Night timer	ON
o98	Common Functions	Light at Main switch OFF			Normal ctrl.	OFF
o17	Display control	Display air S4%	0	100	50	100
P41	Alarm relay priorities	Alarm relay priority			High Priority	Medium priority
o03	Network address		0	0	0	240
o00	Thermostat control	Cut-out 1	-50.0	2.0 °C	2.0 °C	50.0

Print Report Close

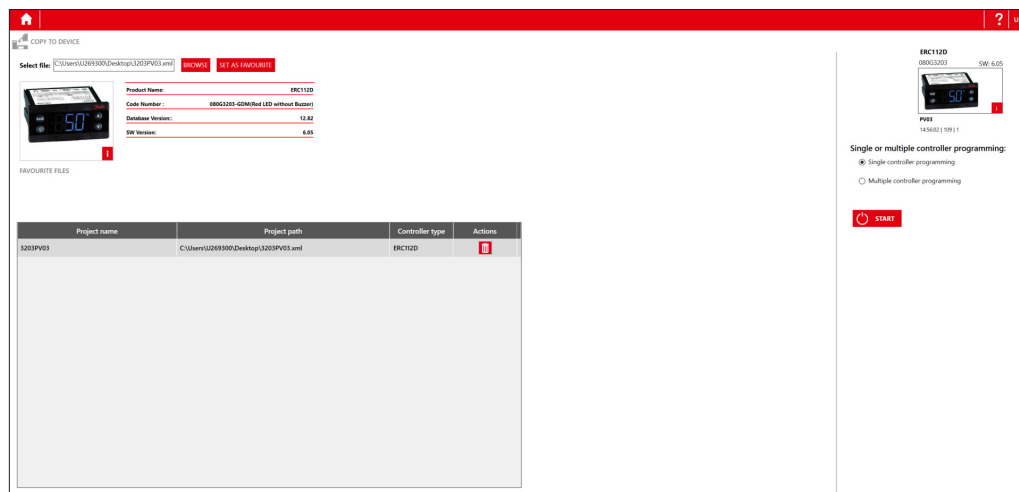
12
Main switch
Description:
Start / stop of refrigeration. With this setting refrigeration can be started, stopped or a manual override of the outputs can be allowed. (For manual control the value is set at -1). Then the outputs can be force controlled. Start / stop of refrigeration can also be accomplished with the external switch function connected to a DI input. Stopped control will give a 'Main switch OFF' alarm.

8. Copy to device



This feature allows you to transfer setting files to the connected controller and upgrade its firmware.

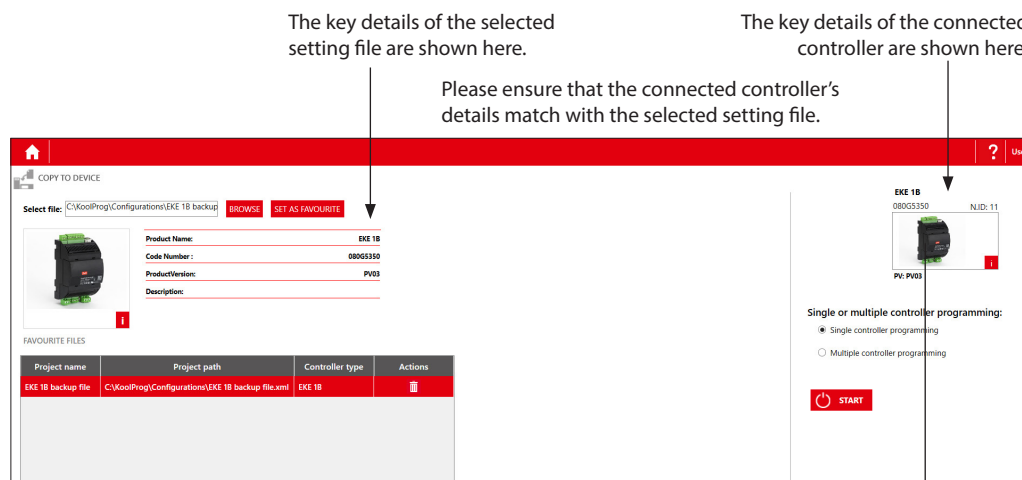
Note: Firmware upgrade feature is only supported for compatible controller models.



Steps to Copy Setting Files:

1. Browse and select the project or setting file you want to copy to the controller.
2. If the selected project file matches the connected controller, 'START' button is enabled.
3. Click 'START' to begin copying the data from the project file to the controller.
4. The file transfer will proceed, and the progress and completion status will be displayed.

Note: You can also save a browsed file or project as a 'Favourite' for quick access later



Multiple Controller Programming

If you want to program multiple controllers with the same settings, use "Multiple Controller Programming."

Set the number of controllers to be programmed, connect the controller and click "START" to program the file - wait for the data to be transferred.

Connect the next controller and click "START" again.

Single or multiple controller programming:

- ☐ Single controller programming
☒ Multiple controller programming

Set Counter:

- ☒ CountUp Timer(0-...)
☐ Countdown Timer(...-0)



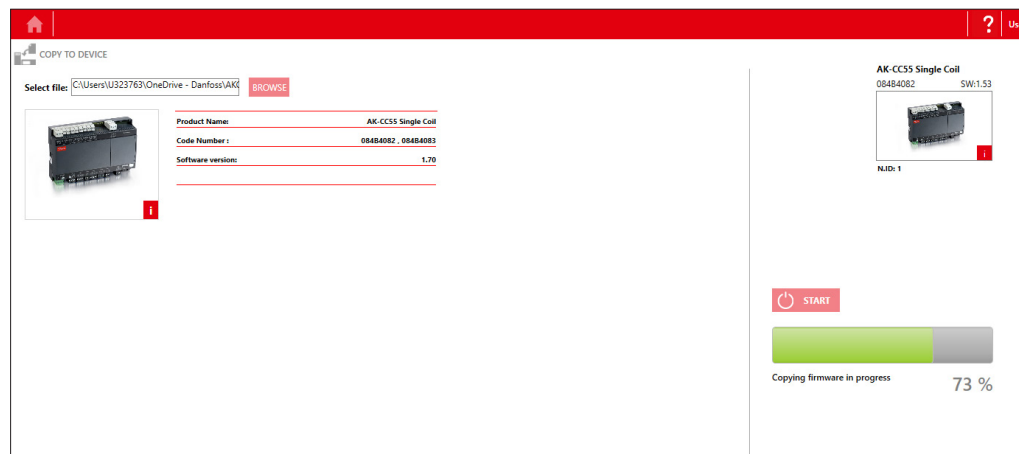
Counter: 0



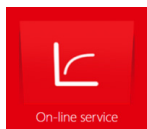
Counter reset to start position ("0" or "Set counter" value).

Firmware upgrade (only for AK-CC55, AK-CC25, EETa and EKE100/110):

1. Browse the firmware file (Bin file) you want to program – selected firmware file details are displayed on the left hand side.
2. If the selected firmware file is compatible with the connected controller, KoolProg enables the start button and will update the firmware. If it is not compatible, the start button remains disabled.
3. After a successful firmware update, the controller restarts and displays the updated details of the controller.
4. This feature can be fully protected by a password. If KoolProg is password protected, then when you browse the firmware file, KoolProg prompts for the password and you can only load the firmware file after entering the correct password.



9. Online service



This allows you to monitor the real-time operation of the controller while it is running.

- You can monitor inputs and outputs.
- You can display a line chart based on parameters you have selected.
- You can configure settings directly in the controller.
- You can save and store line charts and settings.

Open
Allows you to view prior line charts you have made from collected data.

Save as
Allows you to save a project file containing all the controller's settings.

Arrow Up/Down
Clicking the arrow allows you to hide the photo and the top block of information, so that more space is available on screen for parameter views. Clicking the arrow again makes it re-appear.

The Trend Feature
If you want to chart the trend for a measurement, you can select what you want to view from this table. Tick the box of any parameter you would like to include in the chart. You can select a maximum of 10 parameters.

Compare settings feature
Allows you to compare default value and value of the same parameter in controller.

Line Chart
Click the "Line Chart" button to switch over to the trend view. You can begin charting any measurements you want in the trend view.

Active and History alarms (only for AK-CC55 and AK-CC25):

Under the "Alarms" tab, the user can view the active and historical alarms present in the controller with a time stamp.

Application: 7. Dual with 2 evap.

Label	Alarm	Active at	Cancelled at	Priority
A71	Low temperature alarm B	9/26/2022 12:55:57 PM	---	High
A02	Low temperature alarm A	9/26/2022 12:25:46 PM	---	High
E14	S3 Air OFF evap. A - Sensor error	9/26/2022 12:25:59 PM	---	High
E26	S4 Air OFF evap. A - Sensor error	9/26/2022 12:25:59 PM	---	High
E25	S3 Air ON evap. A - Sensor error	9/26/2022 12:25:59 PM	---	High
E24	S2 Gas outlet A - Sensor error	9/26/2022 12:25:59 PM	---	High
A45	Main switch set OFF	9/26/2022 12:25:55 PM	9/26/2022 12:25:58 PM	Low
E26	S4 Air OFF evap. A - Sensor error	9/26/2022 12:25:46 PM	9/26/2022 12:25:56 PM	High
E25	S3 Air ON evap. A - Sensor error	9/26/2022 12:25:46 PM	9/26/2022 12:25:56 PM	High
E24	S2 Gas outlet A - Sensor error	9/26/2022 12:25:46 PM	9/26/2022 12:25:56 PM	High
E26	S4 Air OFF evap. A - Sensor error	9/26/2022 9:23:25 AM	9/26/2022 12:25:38 PM	High
E25	S3 Air ON evap. A - Sensor error	9/26/2022 9:23:25 AM	9/26/2022 12:25:38 PM	High
E24	S2 Gas outlet A - Sensor error	9/26/2022 9:23:25 AM	9/26/2022 12:25:38 PM	High
A03	Low temperature alarm A	9/26/2022 9:52:34 AM	9/26/2022 12:25:37 PM	High
E26	S4 Air OFF evap. A - Sensor error	9/23/2022 12:36:32 PM	9/26/2022 9:16:48 AM	High
E25	S3 Air ON evap. A - Sensor error	9/23/2022 12:36:32 PM	9/26/2022 9:16:48 AM	High
E24	S2 Gas outlet A - Sensor error	9/23/2022 12:36:32 PM	9/26/2022 9:16:48 AM	High
E26	S4 Air OFF evap. A - Sensor error	9/23/2022 11:44:50 AM	9/23/2022 12:07:20 PM	High
E25	S3 Air ON evap. A - Sensor error	9/23/2022 11:44:50 AM	9/23/2022 12:07:20 PM	High
E24	S2 Gas outlet A - Sensor error	9/23/2022 11:44:50 AM	9/23/2022 12:07:20 PM	High
E26	S4 Air OFF evap. A - Sensor error	9/23/2022 11:43:28 AM	9/23/2022 11:44:22 AM	High
E24	S2 Gas outlet A - Sensor error	9/23/2022 11:43:28 AM	9/23/2022 11:44:22 AM	High

AK-CC55 Single Coil
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Low temperature alarm B
Control state A - Emergency control
Thermostat air temp. A: 18.0 °C
S3 Air ON evap. B: 80.0 °C
Thermostat cut-out temp.: 2.0 °C
Low alarm limit: -30.0 °C

Description:
The alarm temperature has been below the min alarm limit for a longer time period than the set alarm delay.

IO Status and Manual Override (only for AK-CC55 and AK-CC25):

The user can get an instant overview of configured inputs and outputs and their status under this group. The user can test the output function and electrical wiring by putting the controller into manual override mode and controlling the output manually by switching them ON and OFF.

Application: 2. Compe/Rail/Light

I/O Point	I/O Function	Status
AI1	Analog Input	12.0 bar-g
AI2	S2 Gas outlet A	-80.0 °C
AI3	S3 Air ON evap. A	-80.0 °C
AI4	S4 Air OFF evap. A	-80.0 °C
AO1	Rail heat PWM	100%
DO1	EEV opening A	10%
DO2	Rail heat	ON
DO3	Compressor 1	ON
DO4	Defrost A	OFF
DO5	Light	ON
DO6	Fan	ON

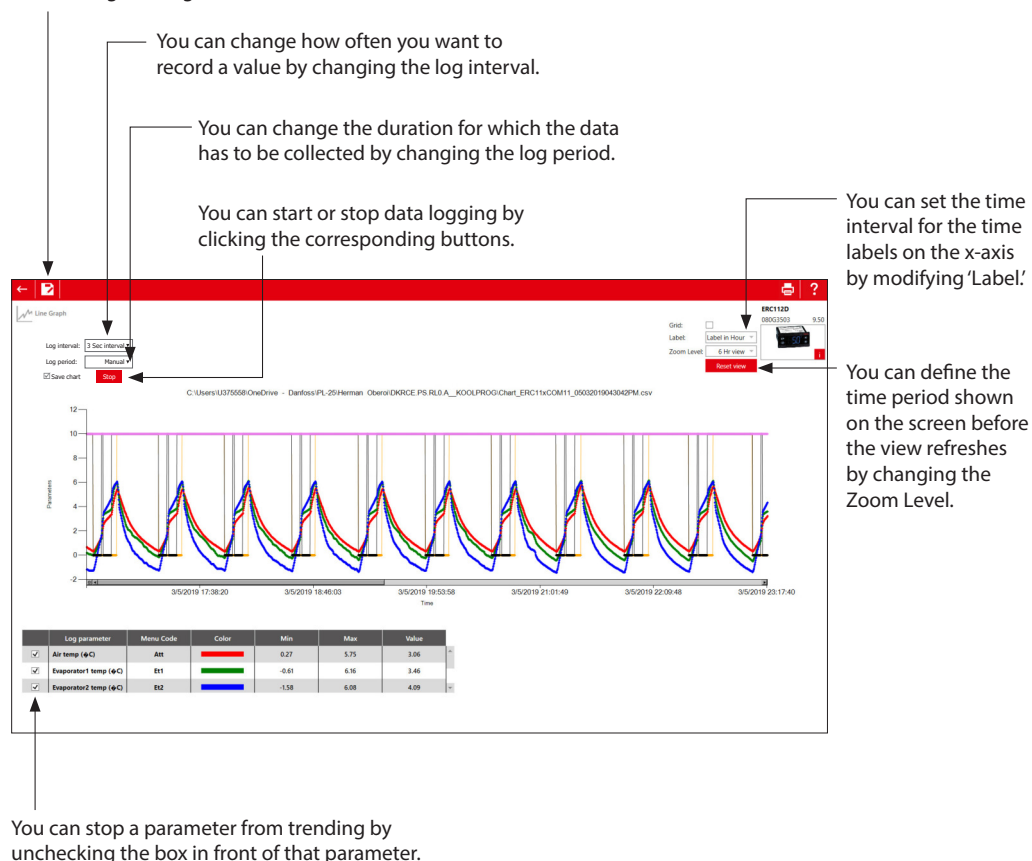
Main switch: ☐ Manual ☐ Stop ☒ Start

AK-CC55 Single Coil
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NAB-1 22155 PA(1)1548(1)162(1)76

AI1
Pe Evap. pressure
Description:
Actual sensor signal

Trend Charts

The program only saves data if the "Save chart" box is checked.
If you want to save the collected data in another file format, use the "Save As" command. This enables you to save data in a .csv/.png file format.
After saving an image, the chart can be viewed later in selected file format.



10. Unknown controller support

(Only for ERC 11x, ERC 21x and EET controllers)

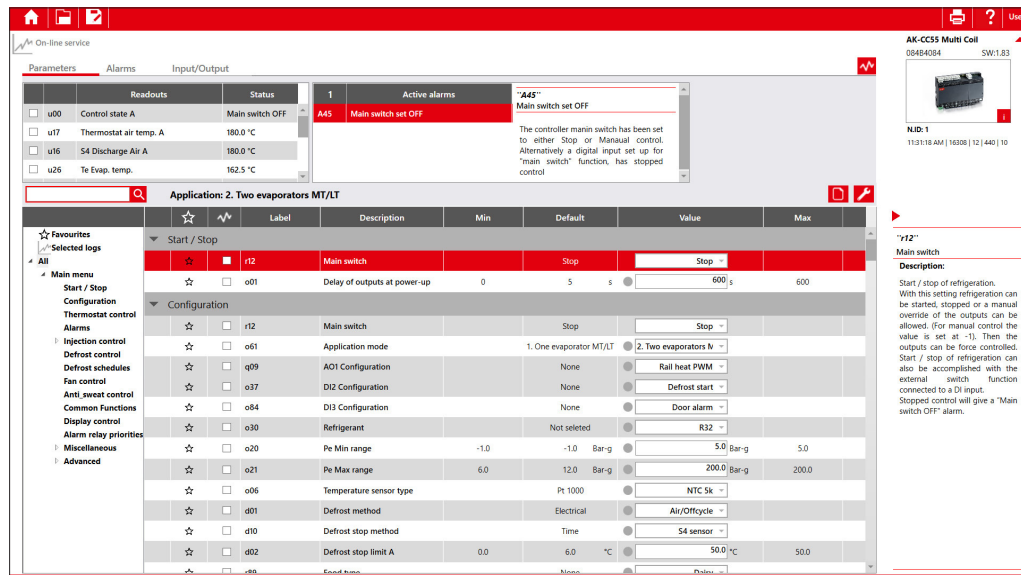
If a new controller is connected, the database of this is not already available in the KoolProg, but you can still connect to the controller in on-line mode. Select "Import settings from connected device" or "On-line service" to view the parameter list of the connected controller. All new parameters of the connected controller will be displayed under the separate menu group "New Parameters". The user can edit the parameter settings of the connected controller and save the setting file on the PC to mass program using "Programming EKA 183A (Code no. 080G9740)".

Note: a saved setting file created in this way cannot be re-opened in KoolProg.

Fig 9: Unknown controller connection under "Import settings from connected device":



Fig 10: Unknown controller connection under "On-line service":



Please contact your nearest sales representative for further assistance.

Danfoss A/S

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