

ENGINEERING  
TOMORROW

*Danfoss*

User Guide

# KoolProg®

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## 0.0 Introduction

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

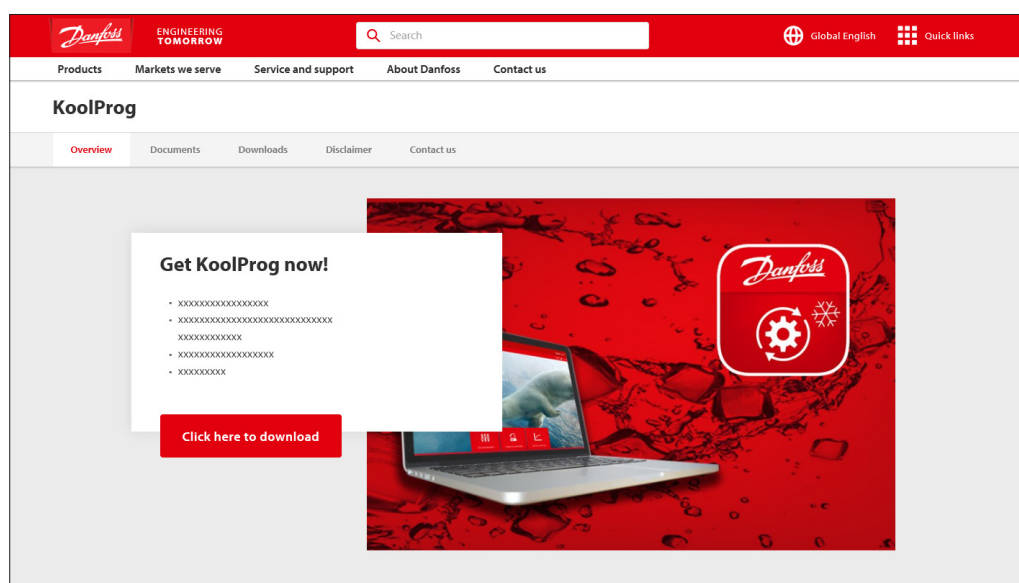
With one KoolProg software, you can now take advantage of new intuitive features such as the selection of favorite parameter lists, writing online as well as offline program files, and monitoring or simulating alarm status activities. These are only some of the new features that will minimize the time R&D and production will spend on development, programming, and testing the Danfoss range of commercial refrigeration controllers.

Supported Danfoss products: ETC 1H, EETc/EETa, ERC 111/112/113, ERC 211/213/214, EKE 1A/B/C, AK-CC55, EKF 1A/2A.

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

## 1.0 Downloading .exe file

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



## 2.0 System requirements

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

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

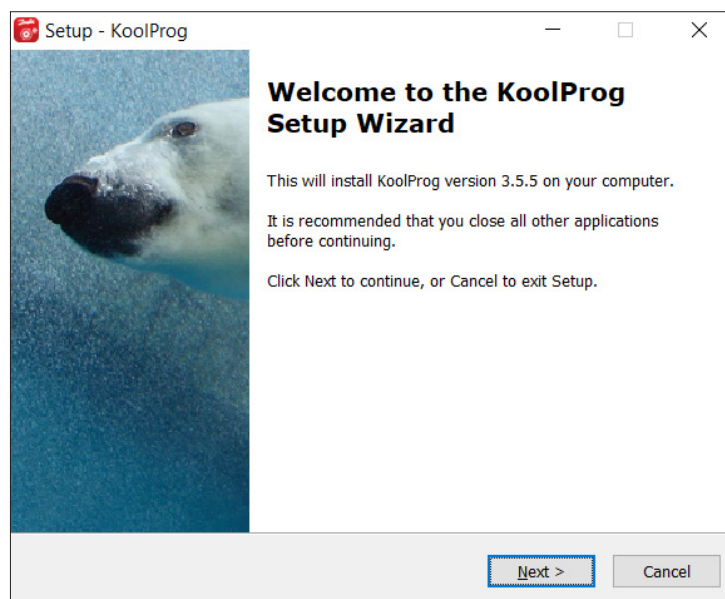
**Macintosh operating system is not supported.**

**Running the setup directly from windows server or network file server is not recommended.**



### 3.0 Installing software

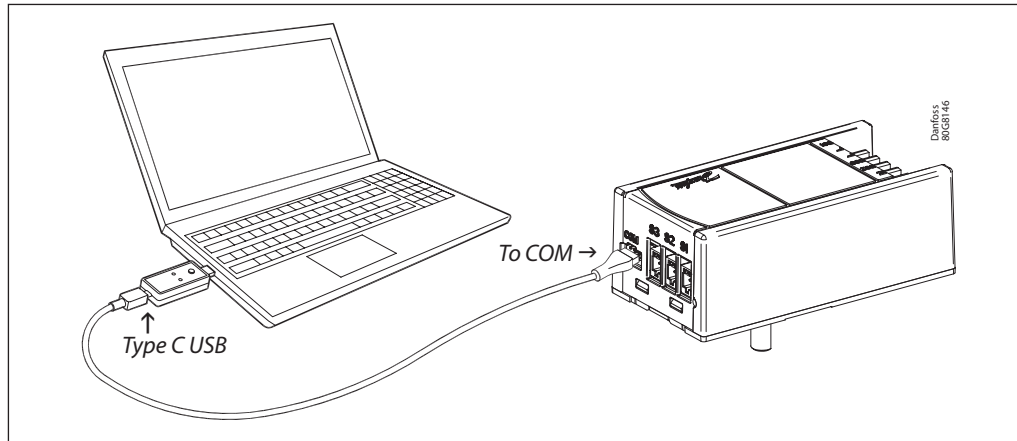
- Double click on the KoolProg® setup icon  
Run the installation wizard and follow the onscreen instructions to complete the KoolProg® installation.



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

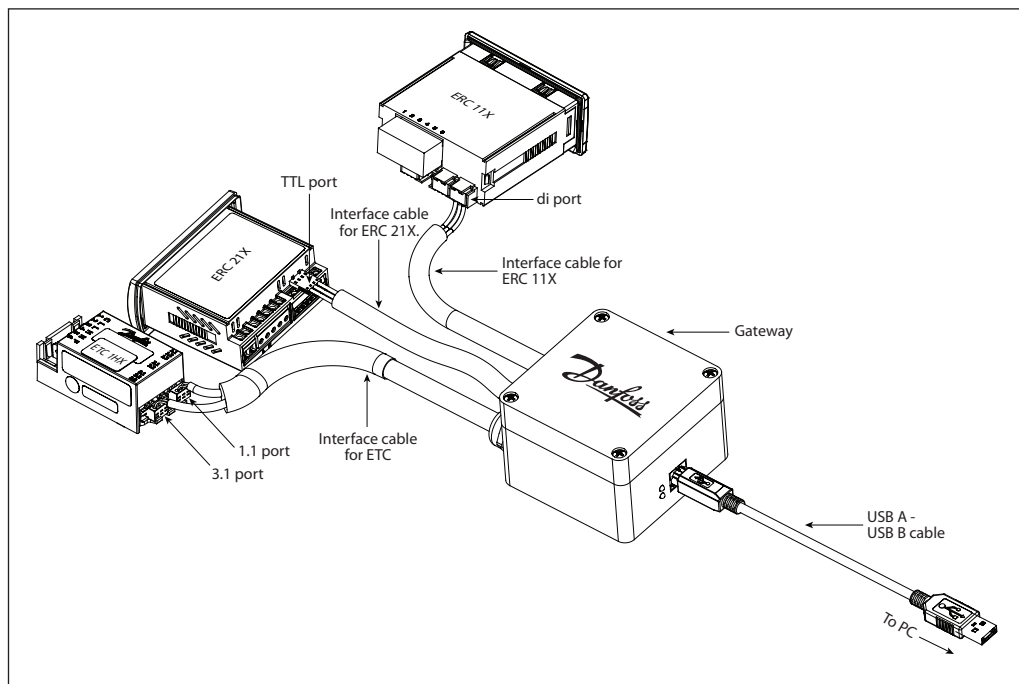
### 4.0 Connection with controllers

**Fig 1: For EET using KoolKey and cable**



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

**Fig 2: For ERC and ETC using Danfoss gateway**  
(Code No. 080G9711)



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

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

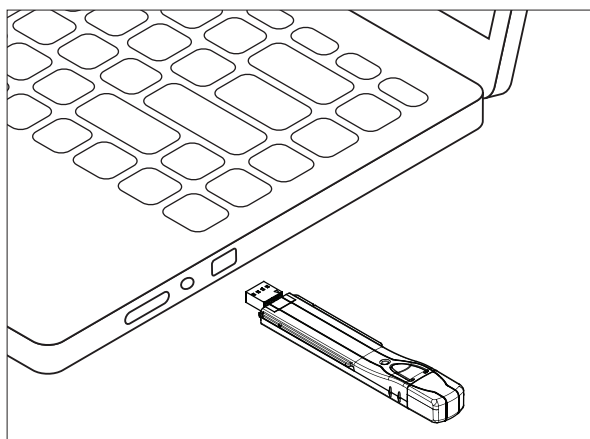
**Fig 3: Mass programming of EET and ERC controllers**

*For EET:*

Insert the KoolKey to PC's USB port and save the config file created using KoolProg in *080Nxxxx.xml* format where xxxx are code no. of the controller.

*For ERC:*

Connect EKA programming key to USB port of PC/laptop and transfer the file in *.erc* format from computer to the programming key.

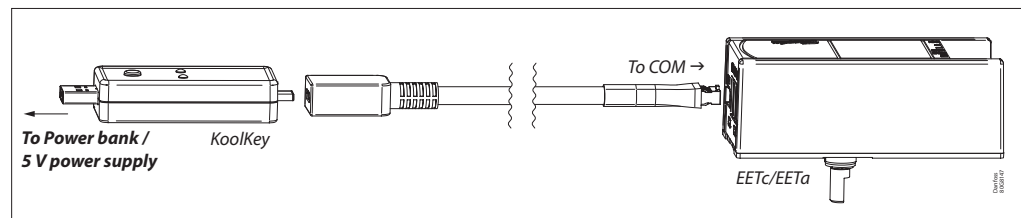




### Transferring the file from KoolKey to EET controller:

For EETa the controller has to be powered with main power or KoolKey must be powered with 5 V supply.  
For EETc the KoolKey has to be mandatorily powered up with 5 V supply.

**CAUTION:** Do not power the KoolKey and controller together.



For more details, please refer KoolKey User Guide: BC349529829398en-000102.

### Transferring the file from EKA key to ERC controller:

Fig 3a: Transferring to ERC 11X

Insert EKA 183A(080G9740) into docking station (080G9701).

Place ERC 11X controller on docking station and keep it pressed down until the successful programming indicator turns green.

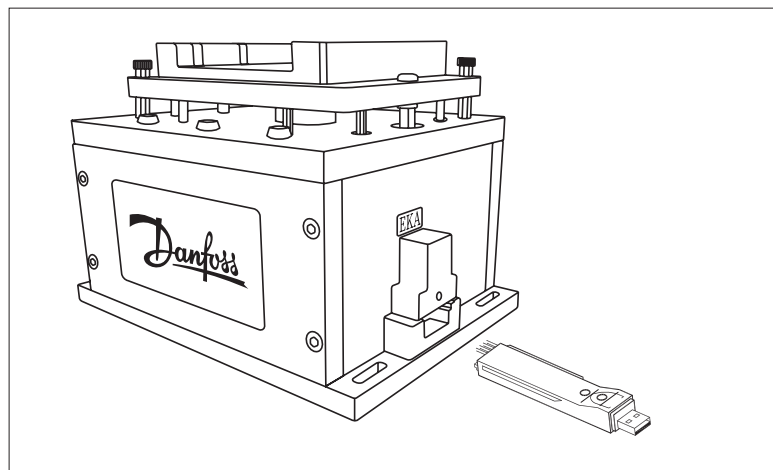
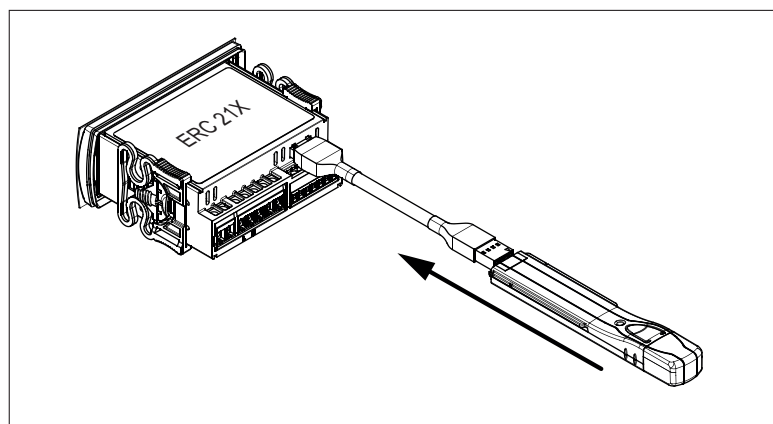


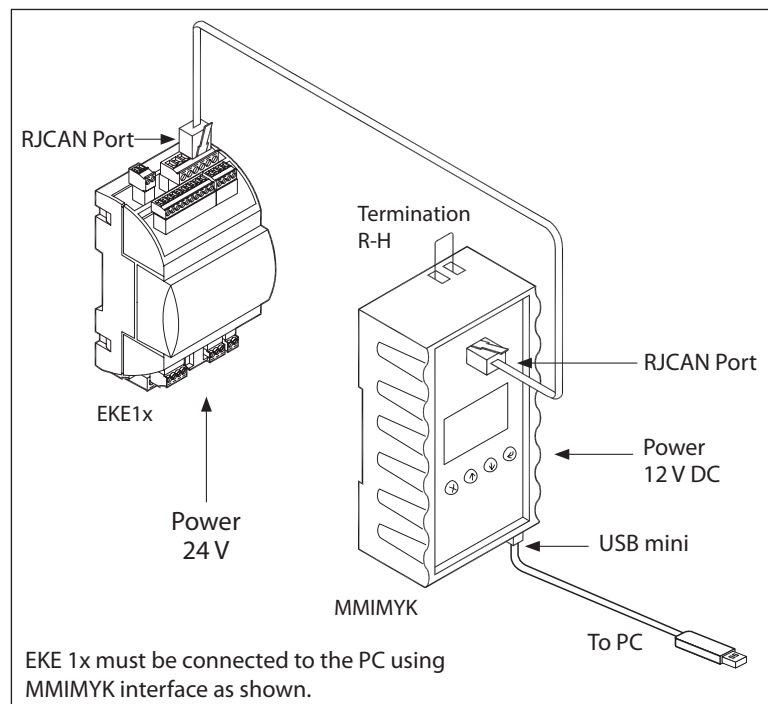
Fig 3b: Transferring to ERC 21X:

Insert EKA 183B (080G9741) into the TTL port of ERC 21X as shown in image below.  
Press the button to initiate transfer of file from EKA 183B to ERC21X.

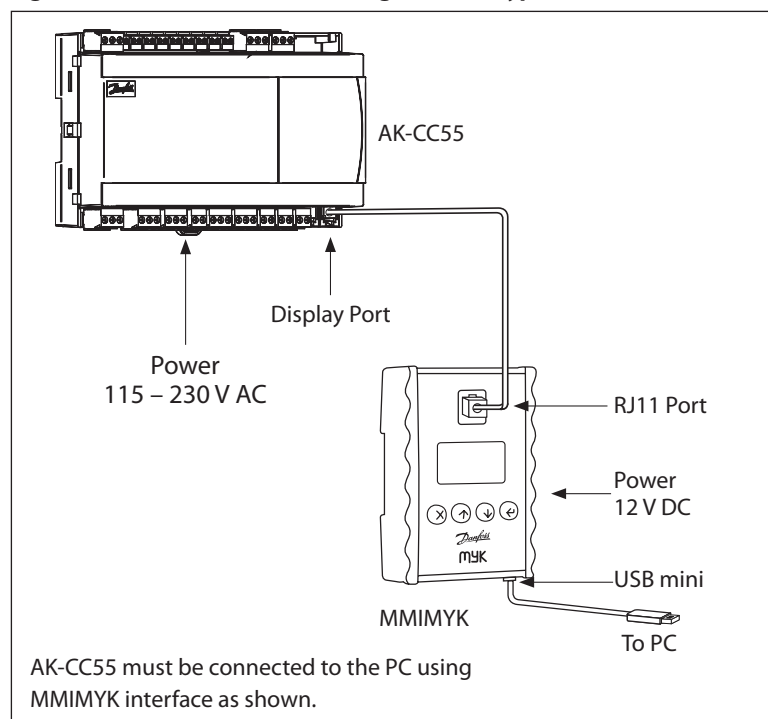


For more information, please refer to EKA 183B (080G9741) instruction sheet provided in the kit.

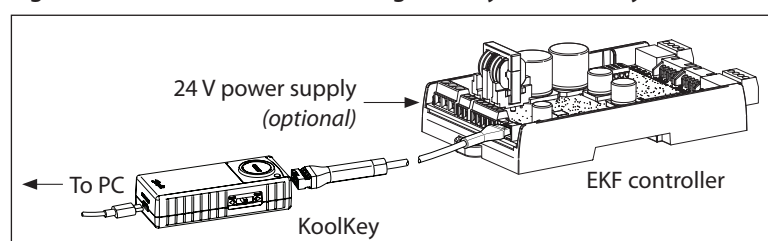
**Fig 4: Connection for EKE using interface type MMIMYK (Code No. 080G0073)**



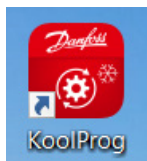
**Fig 5: Connection for AK-CC55 using interface type MMIMYK (Code No. 080G0073)**



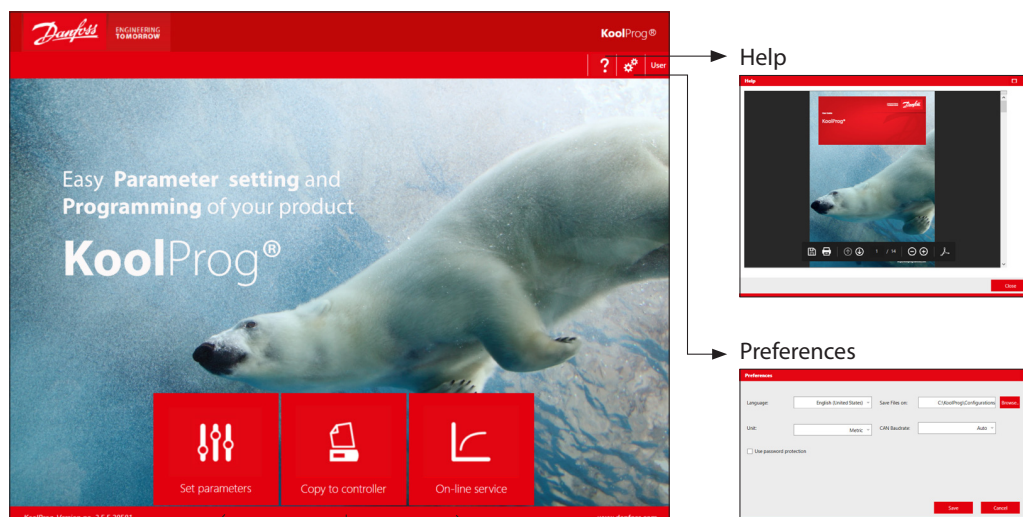
**Fig 6: Connection for EKF1A/2A using KoolKey as a Gateway.**



## 5.0 Starting the program



Double click on the desktop icon to launch KoolProg application

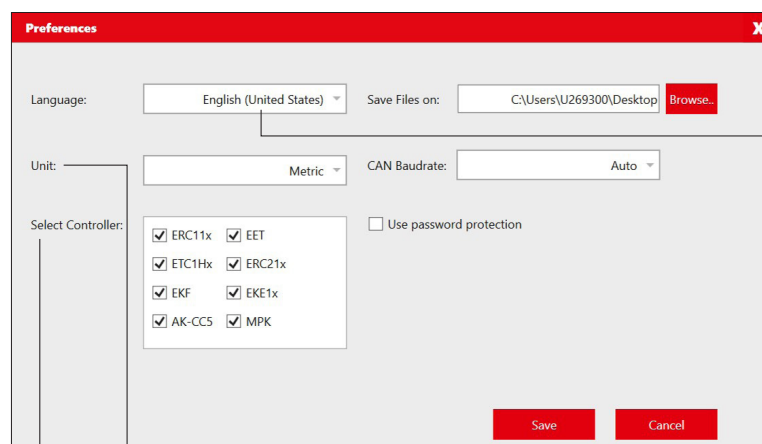


### The program's features

To create new parameter setting files either importing from controller or offline.

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

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



Choose the preferred language

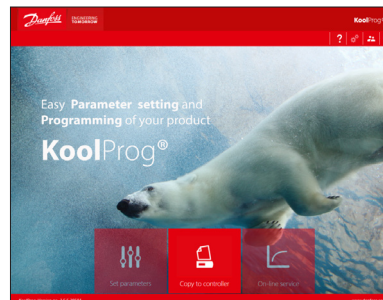
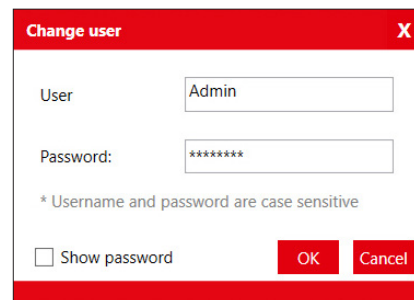
Select the units you prefer to work with:  
Metric (°C and bar)  
Imperial (°F and PSI)

Select the controller type you are using. By default all controller types are selected, however by selecting only the controller type you are connecting will reduce the connection time.

### Accessibility

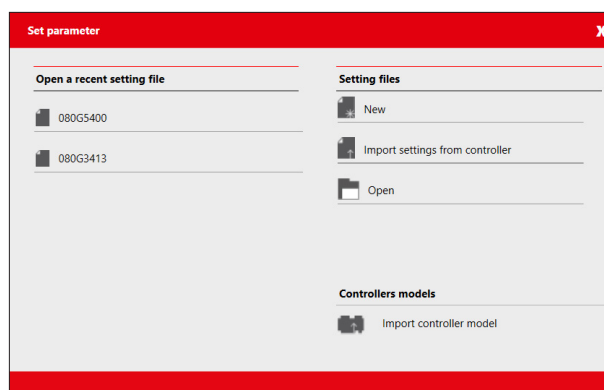
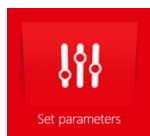
Users with a password have access to all features.

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





## 6.0 Set parameters

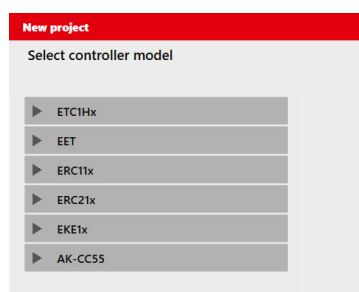


This feature allows you to configure parameter settings for your application.

Click one of the icons in the right column to create a fresh configuration offline or import settings from a connected controller or open an already saved project.

You can see projects you have already created under "Open a recent setting file".

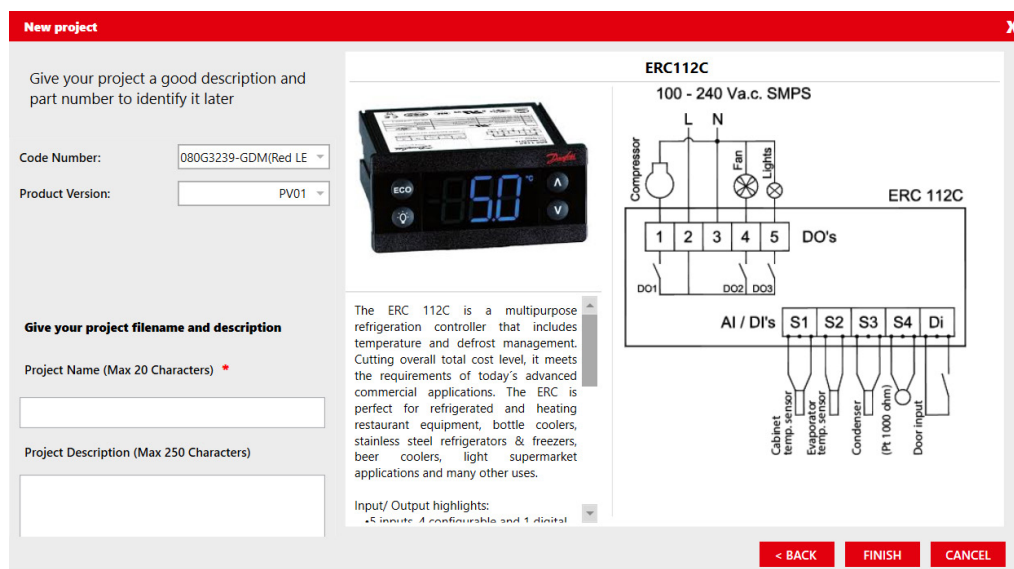
### New



Create 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 offline with a non-standard code number (customer specific code number), use one of the following two methods:

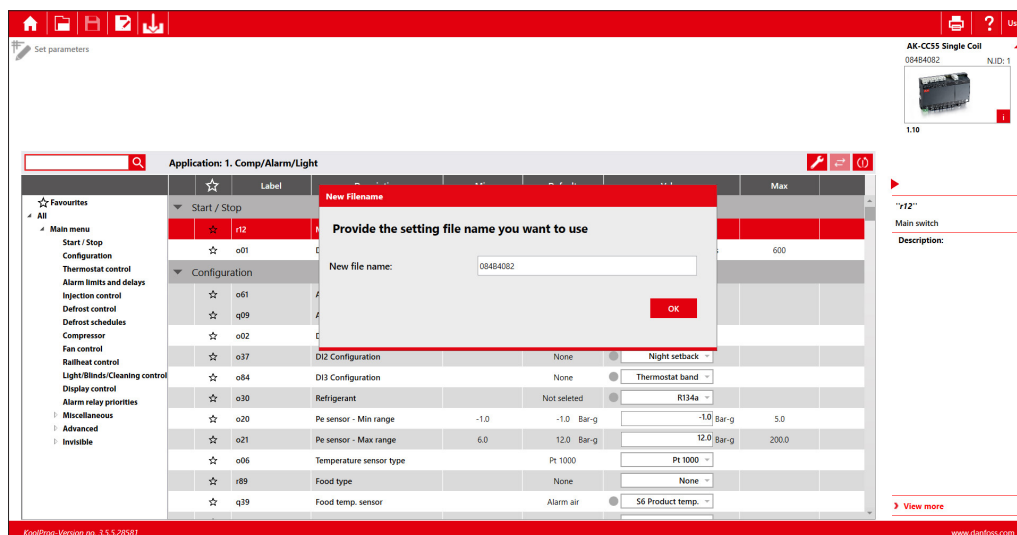
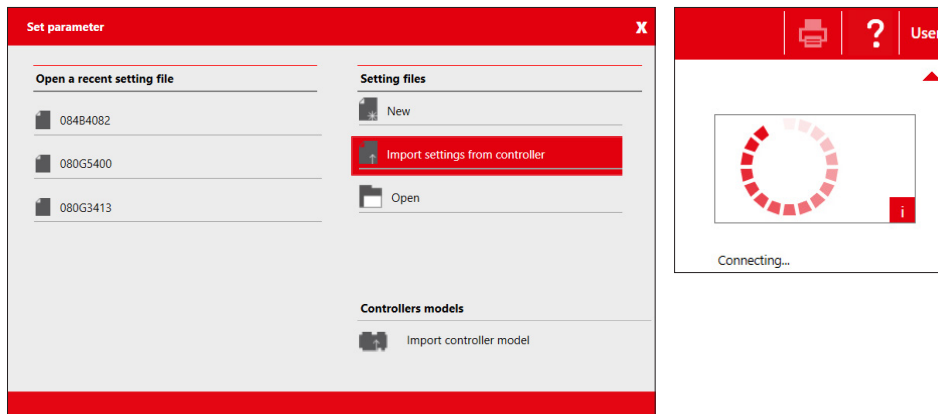
1. Connect the controller of same code number with KoolProg using Gateway, and use "Import settings from Controller" to create a configuration file from it.
2. Use "Open" feature to open an existing locally saved file on your PC of same code number and create a new file from it.

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

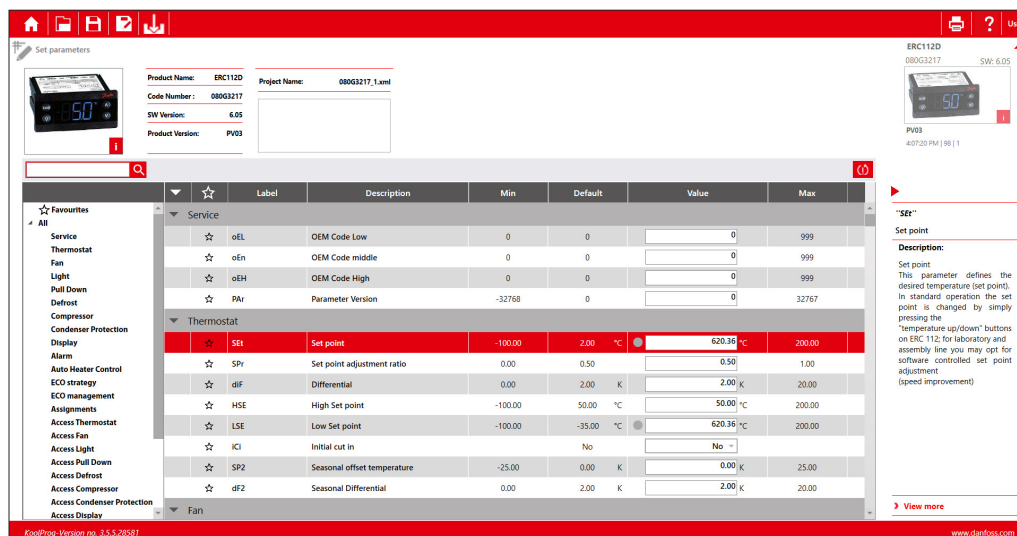
## Import settings from controller

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

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

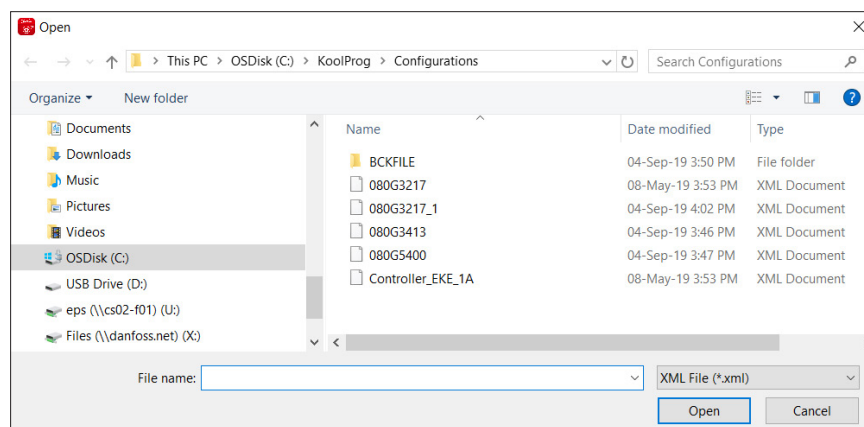


After "Import completed", save the imported setting file by providing the file name in the pop-up message box.



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





"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" .

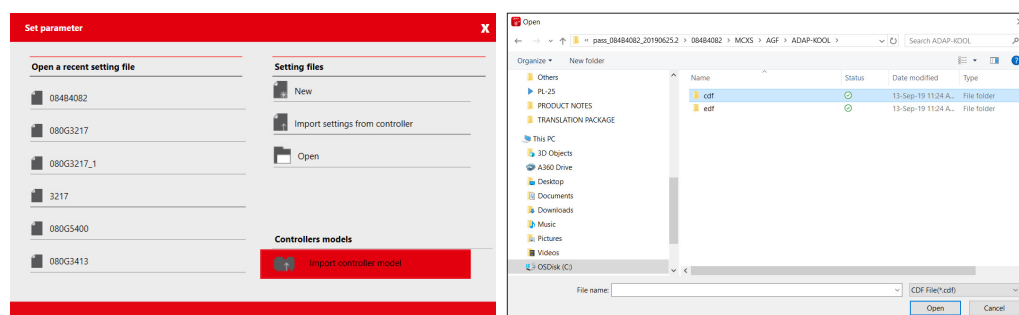
You can also open the setting files you have received from another source and saved in any folder using the browse option. Please note that KoolProg supports multiple file formats (*xml*, *cbk*) for different controllers. select the appropriate setting file format of the controller you are using.

**Note:** *.erc/.dpf* format files of ERC/ETC controller are not visible here. A *.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 Parameter list view of the same controller model. Select Open button  to browse and open *.erc/.dpf* file on your PC.
2. Select "Upload from controller" if you are connected to the same controller online and go to the parameter list view. Select Open button  to browse desired *.erc/.dpf* file and view it in KoolProg.
3. Select "Open" to open any other *.xml* file of the same controller, reach parameter list view screen, and there select Open button to browse and select *.erc/.dpf* file to view and edit these files.

### Import controller model (only for AK-CC55):

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





Set parameters -  
continued

## Info

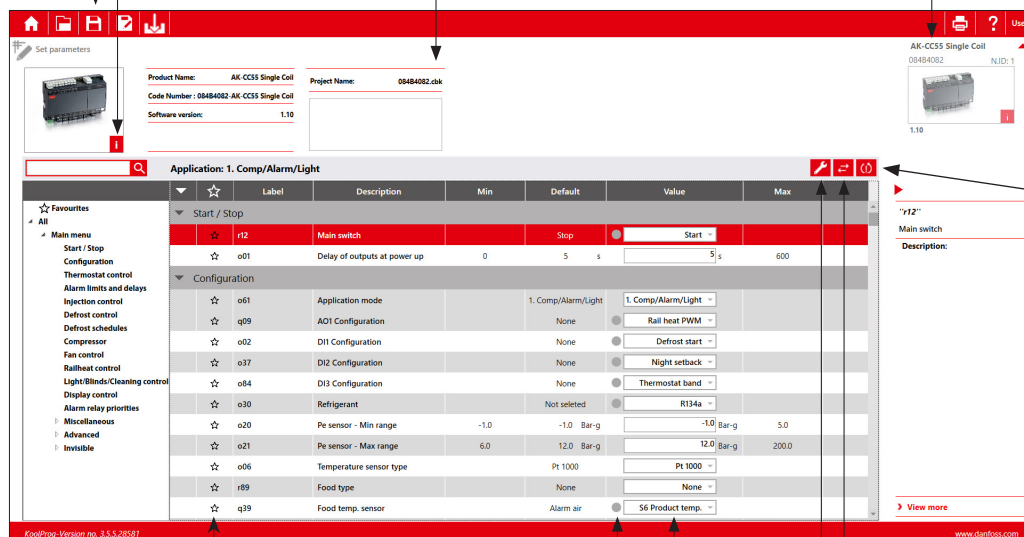
### Headline

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

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.



### 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 reappear.

### 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 reappear.

### View more

This command gives the complete technical description of the controller.

**Convert setting files (only for AK-CC55):**  
To convert setting files from one SW version to another software version of same controller type.

**Quick setup wizard (only for AK-CC55):**  
Helps to set up the controller quickly by configuring a few critical parameters and starting the system.

### 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".

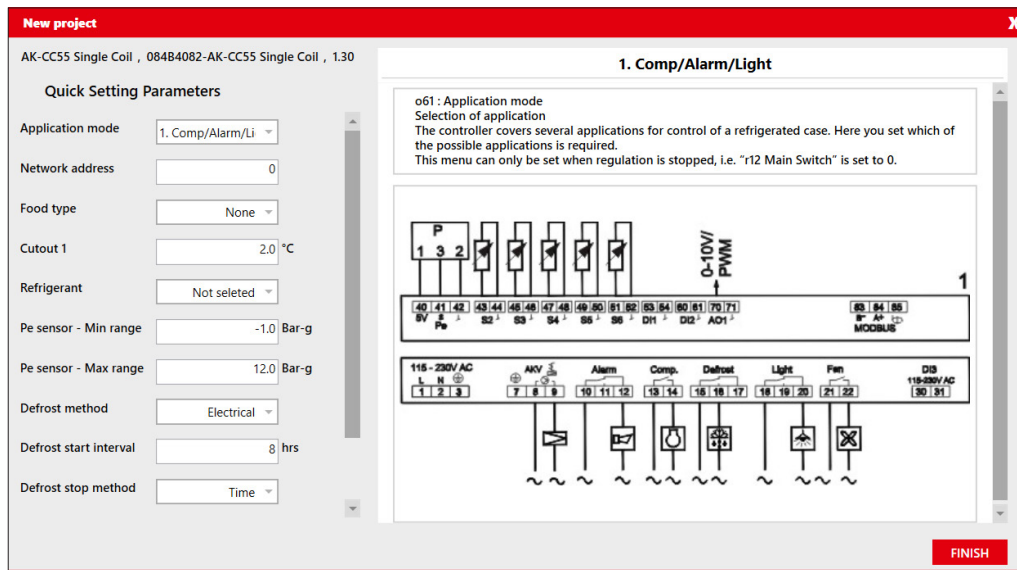
### Favourites

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 setup wizard (only for AK-CC55):

User can run the quick setup both offline and online to set up the controller for the required application before moving on to the detailed parameter settings.



**New project**

AK-CC55 Single Coil , 084B4082-AK-CC55 Single Coil , 1.30

**Quick Setting Parameters**

Application mode: 1. Comp/Alarm/Li

Network address: 0

Food type: None

Cutout 1: 2.0 °C

Refrigerant: Not selected

Pe sensor - Min range: -1.0 Bar-g

Pe sensor - Max range: 12.0 Bar-g

Defrost method: Electrical

Defrost start interval: 8 hrs

Defrost stop method: Time

**1. Comp/Alarm/Light**


o61 : Application mode  
Selection of application  
The controller covers several applications for control of a refrigerated case. Here you set which of the possible applications is required.  
This menu can only be set when regulation is stopped, i.e. "r12 Main Switch" is set to 0.

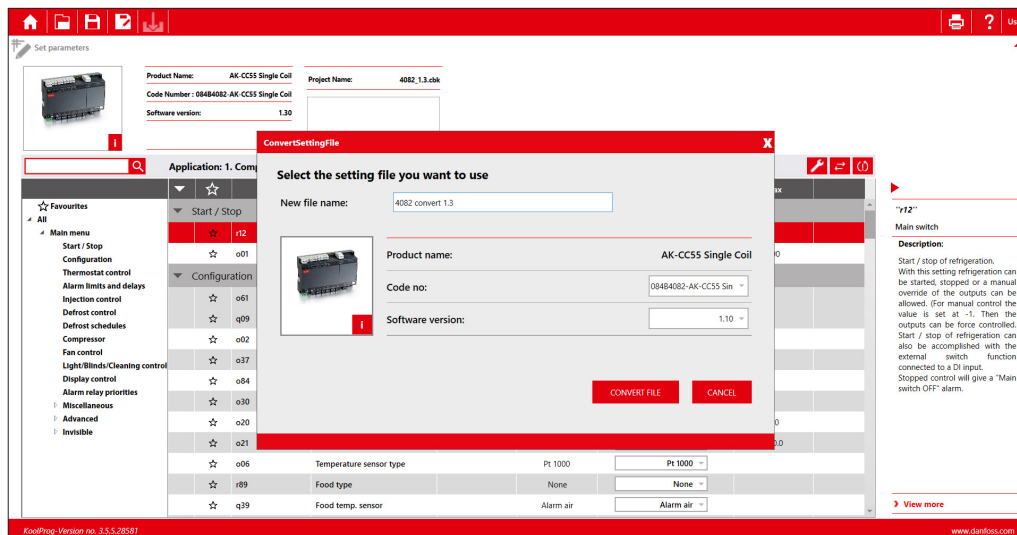
Diagram showing terminal block connections for 115-230V AC, 0-10V/PWM, and various control signals (Alarm, Comp., Defrost, Light, Fan, DIS).

**FINISH**

### Convert setting files (only for AK-CC55):

User can convert the setting files from one software version to another software version of same controller type. 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 of the setting file that needs to be generated and click OK.
4. Pop up message with summary of added, changed and removed parameters displayed at the end of conversion.



**Set parameters**

Product Name: AK-CC55 Single Coil  
Code Number: 084B4082-AK-CC55 Single Coil  
Software version: 1.30

Project Name: 4082\_1.3.dsk

**ConvertSettingFile**

Select the setting file you want to use

New file name: 4082 convert 1.3

Product name: AK-CC55 Single Coil  
Code no: 084B4082-AK-CC55 Sin  
Software version: 1.10

**CONVERT FILE** **CANCEL**

Application: 1. Comp/Alarm/Light

Start / Stop: r12

Configuration: o01, o61, o09, o02, o37, o84, o30, o20, o21, o06, r09, q39

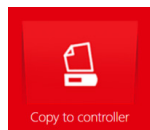
Temperature sensor type: Pt 1000  
Food type: None  
Food temp. sensor: Alarm air

**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.

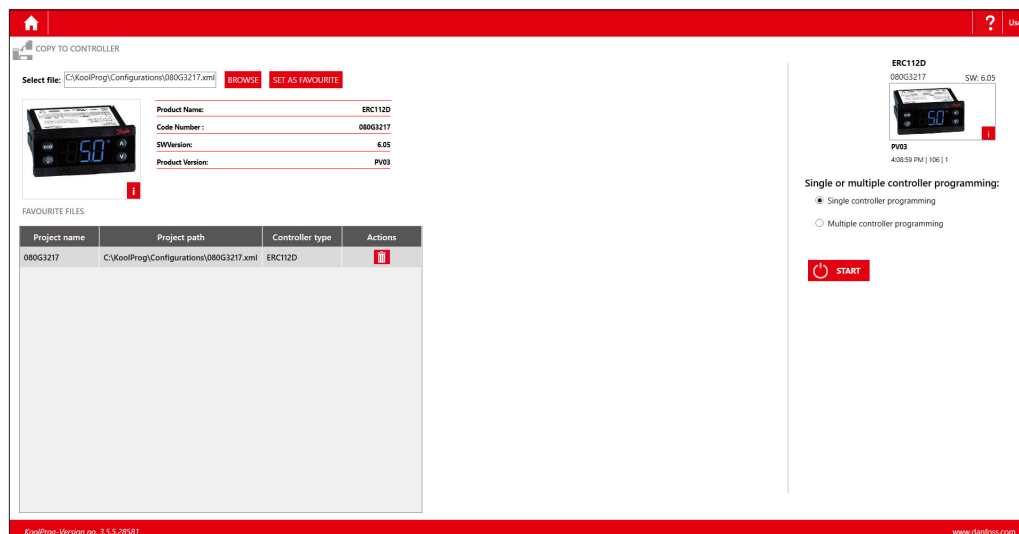
**View more**

KoolProg-Version no. 3.5.5.20581 [www.danfoss.com](http://www.danfoss.com)

## 7.0 Copy to controller



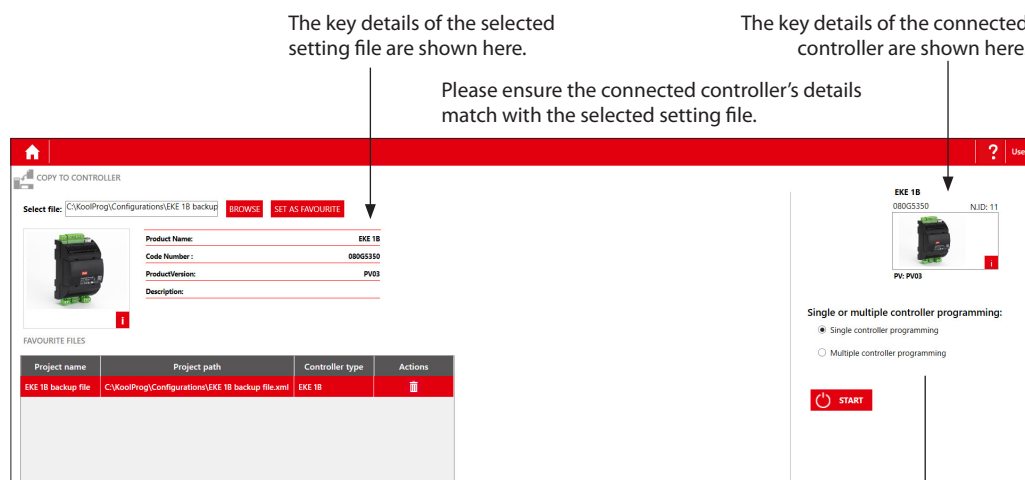
Here you can copy the setting files to the connected controller as well as upgrade the controller firmware. Firmware upgrade feature is only available for the selected controller model.



**Copy the setting files:** Select the setting file you want to program with the "BROWSE" command.

You can save a setting file in "Favorite Files" by clicking on the "Set as Favourite" button. The project will be added to the list and can be easily assessed later. (Click on the trash icon to remove a project from the list).

Once you have selected a setting file, the key details of the selected file are displayed.



If the project file and the connected controller match, data from the project file will be transmitted to the controller when you click the "START" button.

The program checks whether data can be transmitted. If not, a warning message pops up.

### 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

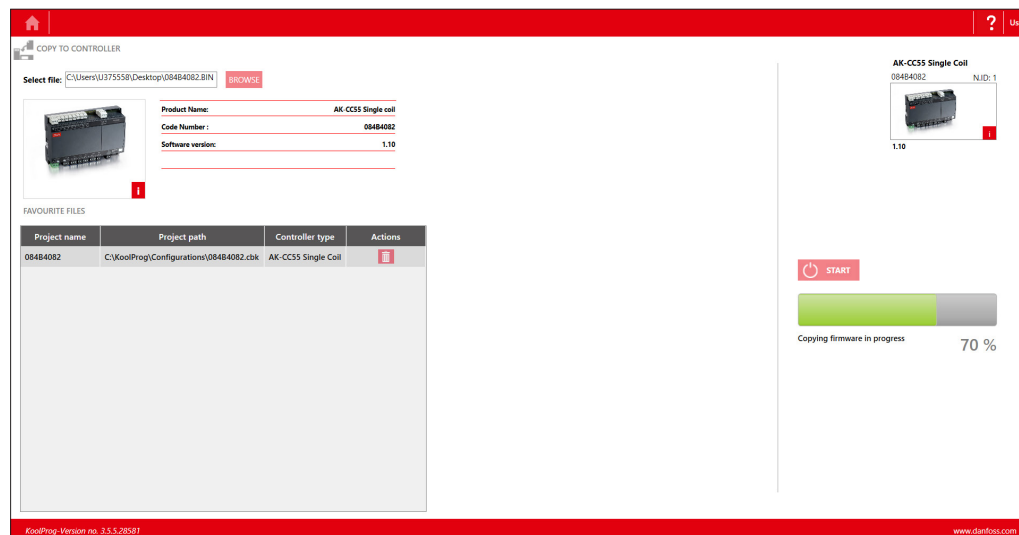


Counter reset to start position ("0" or "Set counter" value).



### Firmware upgrade (only for AK-CC55):

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 connected controller, KoolProg enables the start button and will update the firmware. If it is not compatible, the start button remains disabled.
3. After the successful firmware update, controller restarts and displays the updated details of the controller.
4. This feature can be fully protected by password. If KoolProg is password protected, when you browse the firmware file, koolProg prompts for the password and one can load the firmware file only after entering correct password.



## 8.0 On-line service



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 store line charts and settings and then analyze them.

**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 of 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 parameters view. Clicking the arrow again makes it reappear.

**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.

**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.

The screenshot displays the KoolProg On-line service interface. At the top, there are tabs for Parameters, Alarms, and Input/Output. The Parameters tab is active, showing a list of readouts with checkboxes for selection. Below this, there's a section for 'Application: 3. Comp/Alarm/Rail' with a table of configuration parameters. The table has columns for Label, Description, Min, Default, Value, and Max. Parameters include 'Main switch', 'Delay of outputs at power up', 'Application mode', 'AO1 Configuration', 'DI1 Configuration', 'DI2 Configuration', 'DI3 Configuration', 'Refrigerant', 'Pe sensor - Min range', 'Pe sensor - Max range', and 'Temperature sensor type'. A 'Line Chart' button is visible in the bottom right corner of the interface.

Label	Description	Min	Default	Value	Max
Start / Stop					
☆	o12	Main switch	Stop	Manual	
☆	o01	Delay of outputs at power up	0	5 s	600
☆	o61	Application mode	1. Comp/Alarm/Light	3. Comp/Alarm/Rail	
☆	o09	AO1 Configuration	None	Rail heat PWM	
☆	o02	DI1 Configuration	None	None	
☆	o37	DI2 Configuration	None	Open blinds	
☆	o84	DI3 Configuration	None	Light control	
☆	o30	Refrigerant	Not selected	Not selected	
☆	o20	Pe sensor - Min range	-1.0	-1.0 Bar-g	5.0
☆	o21	Pe sensor - Max range	6.0	12.0 Bar-g	200.0
☆	o06	Temperature sensor type	Pt 1000	Pt 1000	

## Alarms (only for AK-CC55):

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

The screenshot shows the 'Alarms' tab in the KoolProg interface. The main table displays alarms for 'Application: 1. Comp/Alarm/Light'. The table is divided into 'Active Alarms' and 'Cleared Alarms'.

Label	Alarm	Active at	Cancelled at	Priority
E28	S6 product temp. A - Sensor error	01-Jan-00 12:55:31 AM	---	High
E27	S5 Evaporator A - Sensor error	01-Jan-00 12:55:31 AM	---	High
E26	S4 Air OFF evap. A - Sensor error	01-Jan-00 12:55:31 AM	---	High
E24	S2 Gas outlet A - Sensor error	01-Jan-00 12:55:31 AM	---	High
E20	Pe Evap. pressure A - Sensor error	01-Jan-00 12:55:31 AM	---	High

The 'Cleared Alarms' section shows the same set of alarms with timestamps for when they were cleared.

On the right side, there is a detailed view for alarm 'E28', showing the sensor type (S6 product temp. A - Sensor error) and the control state (Control state A : Power up delay). It also displays the thermostat air temp. (180.0 °C), thermostat cutout temp. (2.0 °C), and the product temp. (180.0 °C).

## IO Status and Manual Override:

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

The screenshot shows the 'Input/Output' tab in the KoolProg interface. The 'Main switch' is set to 'Start'. The table displays the status of various I/O points for 'Application: 1. Comp/Alarm/Light'.

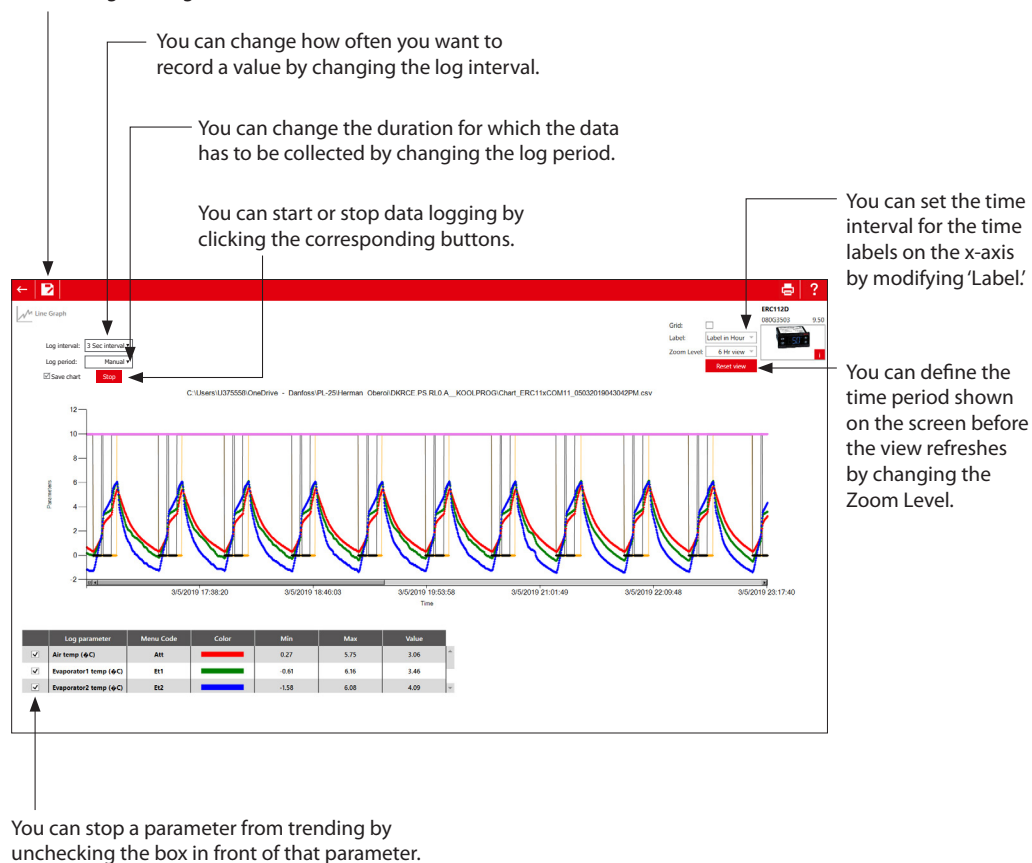
I/O Point	I/O Function	Status
AI1	Pe Evap. pressure	-1.0 Bar.g
AI2	S2 Gas outlet A	180.0 °C
AI3	S3 Air ON evap. A	120.0 °C
AI4	S4 Air OFF evap. A	180.0 °C
AI5	S5 Evaporator A	180.0 °C
AI6	S6 product temp.	180.0 °C
DI1	Defrost start	OFF
DI2	Night setback	OFF
DI3	Thermostat band	OFF
AO1	Rail heat PWM	100 %
DO1	AKV opening A	10 %

The right side of the interface shows a detailed view for the 'AI1' point, displaying the sensor type (Pe Evap. pressure) and the current status (OFF).



## 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 either a .csv/.png file format.  
After saving an image, the chart can be viewed later in selected file format.



## 9.0 Unknown controller support

(Only for ERC 112 & ERC 113 controllers)

If a new controller is connected, the database of which is not already available in the KoolProg, you can still connect to the controller in online mode. Select either "Upload from Controller" in set parameters or "Service and test" to view parameter list of the connected controller. All new parameters of connected controller will be displayed under separate menu group "New Parameters". User can edit the parameter settings of connected controller and save the setting file on PC to mass program using "Programming EKA 183A (Code no. 080G9740)".

Note: saved setting file created in this way cannot be reopened in KoolProg.

Fig 6a: Unknown controller connection under "Upload from controller":

New Parameters

Label	Description	Min	Default	Value	Max
SE2	SE2	-100.00	10.00	10.00	200.00
dI2	dI2	0.00	2.00	2.00	20.00
H52	H52	-100.00	50.00	50.00	200.00
LS2	LS2	-100.00	-35.00	-35.00	200.00
duA	duA	0	0	0	1
FC2	FC2	0	0	0	2
F02	F02	0	0	0	960
FS2	FS2	0	0	0	960
don	don	0	20	20	100
HC1	HC1	0	10	10	240
dHt	dHt	-50.00	10.00	10.00	50.00
dSd	dSd	0	0	0	120
dF2	dF2	0	0	0	3
dE2	dE2	-50.00	-50.00	-50.00	0.00

Fig 6b: Unknown controller connection under "Service and test":

New Parameters

Label	Description	Min	Default	Value	Max
SE2	SE2	-100.00	10.00	10.00	200.00
dI2	dI2	0.00	2.00	2.00	20.00
H52	H52	-100.00	50.00	50.00	200.00
LS2	LS2	-100.00	-35.00	-35.00	200.00
duA	duA	0	0	0	1
FC2	FC2	0	0	0	2
F02	F02	0	0	0	960
FS2	FS2	0	0	0	960
don	don	0	20	20	100
HC1	HC1	0	10	10	240
dHt	dHt	-50.00	10.00	10.00	50.00
dSd	dSd	0	0	0	120
dF2	dF2	0	0	0	3
dE2	dE2	-50.00	-50.00	-50.00	0.00

Please contact your nearest sales representative for further assistance.