# AK-EM 100
# Step by Step Installation Guide

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## 1. Connect the AK-EM 100 according to the instructions (Document RI8LQ152)

## 2. If you connect via a LAN or a WAN, set-up Virtual Servers / Port Forwarding / Mapping in the router

> *Note that you have to browse to the private IP address of the router (usually 192.168.1.1) and enter the password.*

Example*:

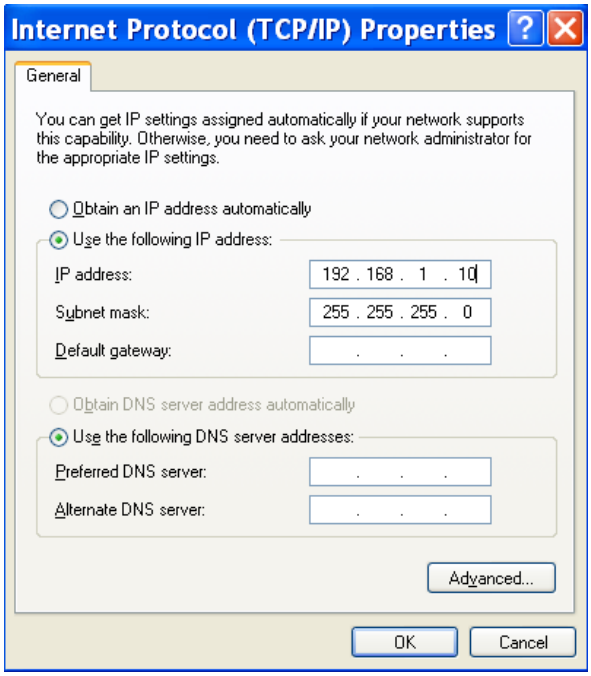
| Name | Private IP | Protocol | Ports | Function |
|---|---|---|---|---|
| EM100 | 192.168.1.100 | Both (TCP/UDP) | 80/80 | HTTP |
| EM100 | 192.168.1.100 | Both (TCP/UDP) | 22/22 | SSH |
| SM xxx | 192.168.1.102 | Both (TCP/UDP) | 1041/1041 | Danfoss port |
| EM100 ST | 192.168.1.100 | Both (TCP/UDP) | 5800/5800 | EM 100 built in ST |
| EM100 ST | 192.168.1.100 | Both (TCP/UDP) | 5900/5900 | EM 100 built in ST |

** This set-up is for 1 AK-EM 100 with local addresses 192.168.1.100, Service Tools and System Manager.*

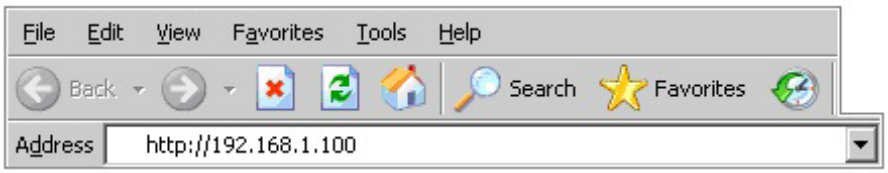
** Ports 22, 5800 and 5900 are subject for hacker attack that might block the EM100. These ports should be open only for service purposes.*

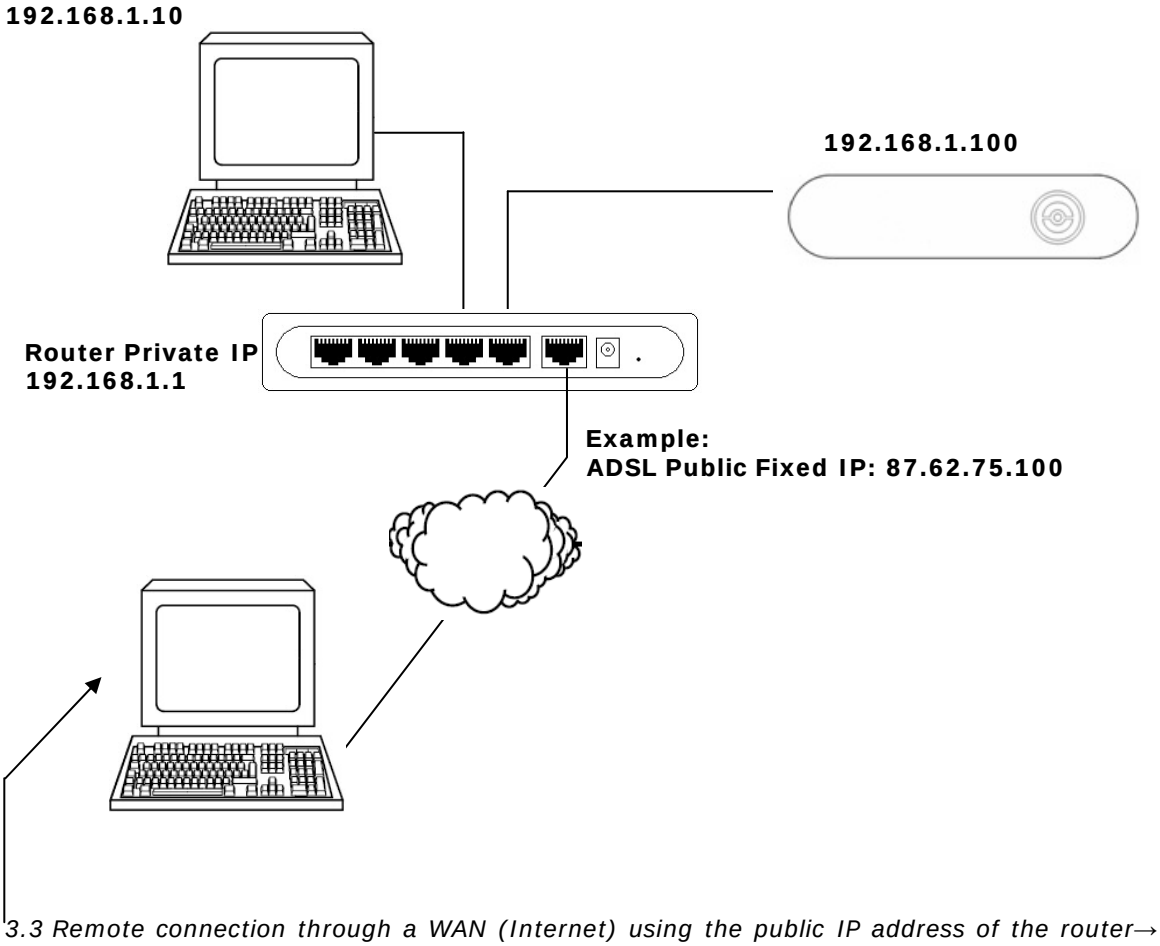
## 3. At this point you can connect to the AK-AK-EM 100 in three different ways:

*3.1 Direct connection using* ***cross cable*** *→ In this case a router is not required: you simply need to make a note of the specific IP address for the AK-EM 100.* Please note that your computer's IP address has to be in the same range as the AK-EM 100 and that it is sometimes necessary to deactivate automatic IP address assignment.



*3.2 Local connection using LAN networks→ In this case the computer is connected to the router and therefore the IP address is in the range of 192.168.1.xxx. So you can browse to AK-EM 100 by typing the specific IP address (192.168.1.100)*

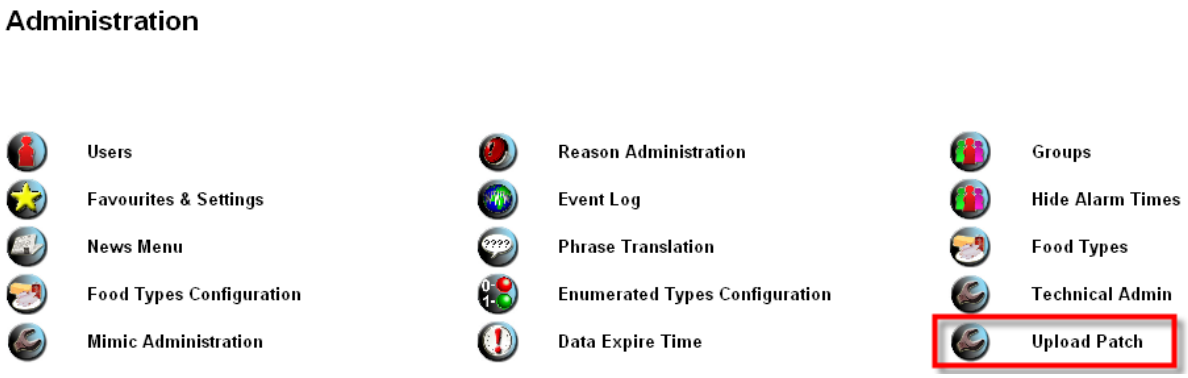



*3.3 Remote connection through a WAN (Internet) using the public IP address of the router→ In this case the router has to be configured for port forwarding to get into the AK-EM 100 (refer to Point 2 of this Guide).*

## 4. Once connected, ensure that the AK-EM 100 has the latest software version.

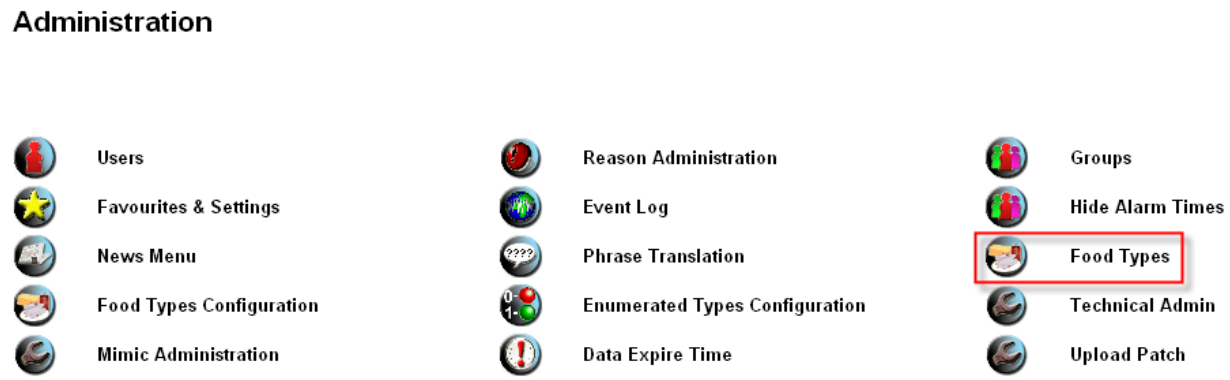
Please be advised, at this point that old software versions **cannot always be** upgraded to the latest version directly. Please contact Danfoss AK Support for more information. For instance, if your current version is 1.4.01, you need to upgrade the AK-EM 100 to 1.4.17 and then to 1.5.00 and finally to 1.5.01.



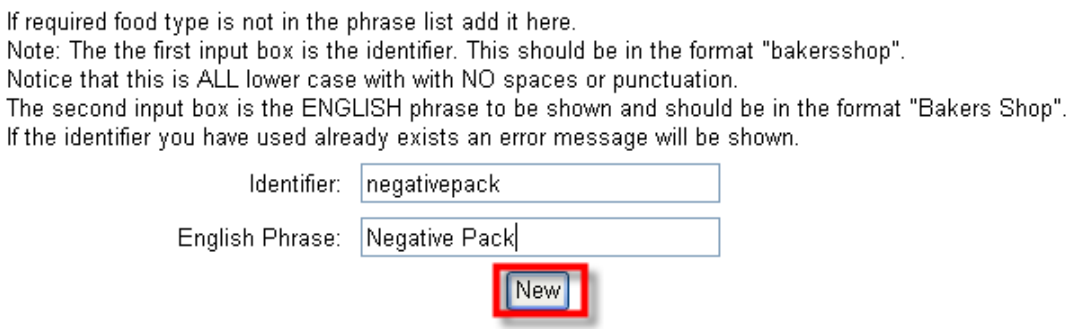

## 5. Prepare HACCP types for the AK-EM 100.

This is where all the food types or HACCP points that you would like to use later in your asset configuration are prepared. It is better to do this *before* the network is uploaded so that the customized food types can be used in the asset configuration for controllers.

This is the menu to create a new Food Type. Please follow the instructions in the AK-EM 100.




*5.1 The first step is to create a new Food Type...*



5.2 Now locate the new Food Type in the list. Please be careful because this list is quite long and it is sometimes difficult to find your input.


5.3 Check that the new Food Type appears in the list…

| Available Food Types | Remove food type |
|---|---|
| Agua Condensacion | Delete |
| Central Congelados | Delete |
| Central Refrigerados | Delete |
| Fresh Fish | Delete |
| Fresh Meat | Delete |
| Frozen Food | Delete |
| Generico CONGELADO | Delete |
| Generico refrigerado | Delete |
| Ice Cream | Delete |
| Obradores | Delete |
| Negative Pack | Delete |

Now the new "Food Type" appears in the list, and will be shown in Food Types Configuration

5.4 Once the Food Type has been created, configure its high temperature range and low temperature range.. All the Food Types will be available in the asset configuration.

Please consider whether you need HACCP points that are different to the temperature. Occasionally it is beneficial to have HACCP points for pressure/temperature in the packs.

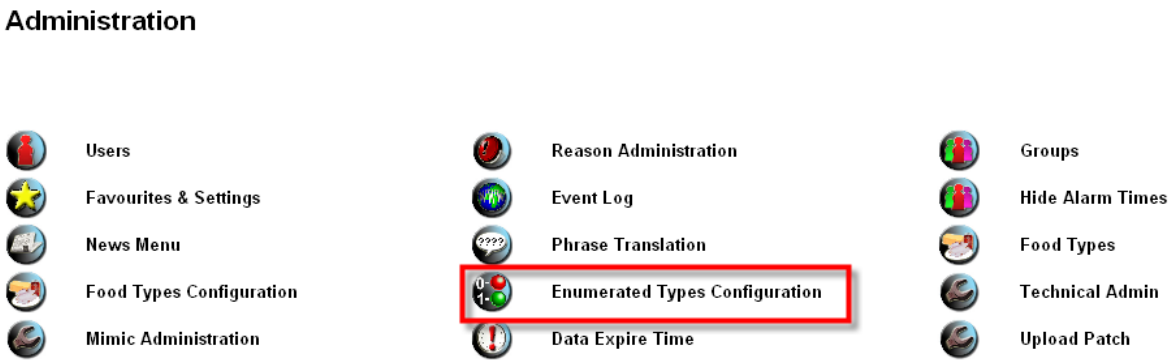
**Food Types Configuration**

| Food Types | Low Temp | High Temp | |
|---|---|---|---|
| Dairy | 1.0 | 4.0 | Delete |
| Fresh Fish | -1.0 | 1.0 | Delete |
| Fresh Meat | -2.0 | 0.0 | Delete |
| Frozen Food | -21.0 | -18.0 | Delete |
| Ice Cream | -24.0 | -21.0 | Delete |
| Produce | 1.0 | 4.0 | Delete |
| Generico Refrigerado | 0.0 | 6.0 | Delete |
| Generico CONGELADO | -21.0 | -18.0 | Delete |
| Central Congelados | -37.0 | -30.0 | Delete |
| Central Refrigerados | -16.0 | -8.0 | Delete |
| Obradores | 12.0 | 16.0 | Delete |
| Agua Condensacion | 24.0 | 27.0 | Delete |
| Select from List | | | |

***Practical note:*** *In large installations it is better to create generic food types for frozen food and refrigerated food. This will save time in the asset configuration because you can copy from one controller to several in the same temperature range. Later a customized food type can be created of the types of goods.*

## 6. Prepare Enumeration for the controllers.

Enumeration is used to convert the numbers that appear in the controllers' parameters into text. This is a very useful function to show, for instance, the status of the controllers. All the enumeration phrases can be translated into your own language and new phrases can be created (for instance, compressor/condenser status in AK-PC controllers).




To learn more about Enumeration, please refer to Appendix A.

## 7. Prepare full commissioning of AKA 245 and AK-SM 720 / AK-SM 350.

At this point we have to work with the gateways (AKA & SM) to ensure that the connection with the AK-EM 100 is a success and to avoid multiple network uploading. These are the points to check:

*7.1 Live controllers in the network → please be sure that all the controllers appears in the gateways when using AKM or ST. Please check the names in the controllers because they will be uploaded into the AK-EM 100.*

*7.2 Logs → it is very important to prepare all the logs you wish to see in AK-EM 100, because it is not possible to create new ones from within the AK-EM 100. Please note that all the parameters that you wish to see in HACCP reports and LOGS MUST BE created like logs in AKA or SM.*

*7.3 Master control functions → please set up all the functions with AKM or ST.*

*7.4 Languages → please check that all the controllers with language configurations are in your preferred language. For instance AKC 100 series or AK2 controllers will be uploaded into the AK-EM 100 in the language selected in the controllers.*

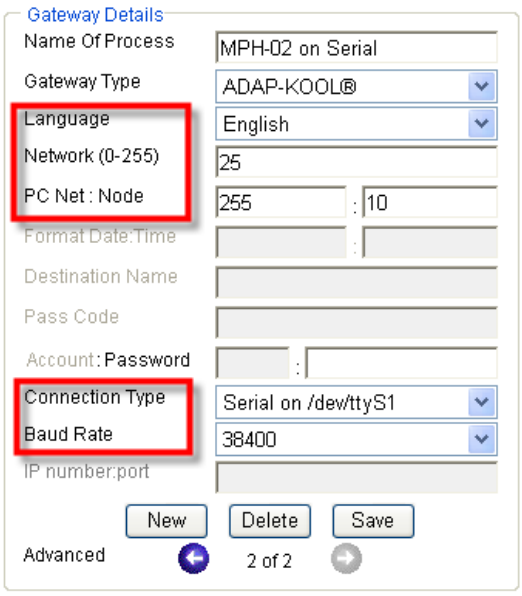
*7.5 Time synchronization → the AK-EM 100 is synchronized with AKA or SM, so please check their time and date.*

*7.6 Baud Rate speed for AKA245 → in order to make the AK-EM 100 faster, it is better to set up the speed in AKA 245 to 38400 bps.*

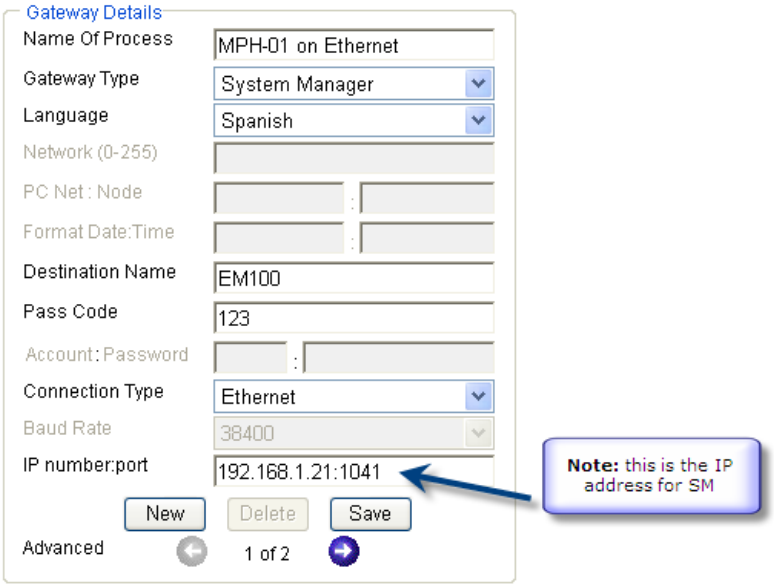
## 8. Set up of the commissioning tool box in AK-EM 100.

Now it is time to upload the network(s) with the AK-EM 100. Please check all the IP addresses or serial connections to the gateways (AKA/SM), and ensure that the following information is correct:

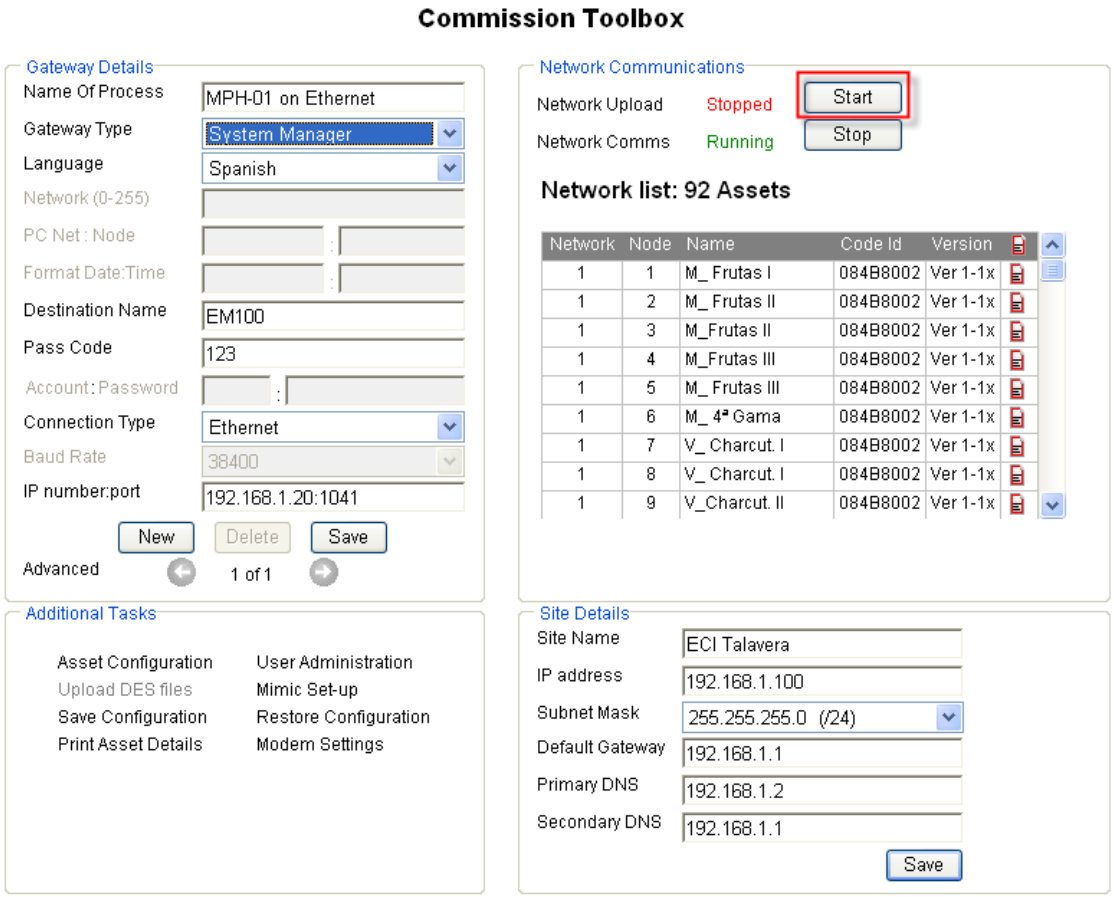
- AKA245 → language, network number, PC net : node, connection type, baud rate.




- System Manager → language, destination & pass code, IP address for SM.



Once the settings are complete, you can start the network upload. Please be aware that this process can take some time, depending oo the number and type of controllers.




***Practical note:*** *Please REMEMBER to always* ***Start Network Comms*** *after uploading the network.*

## 9. Asset configuration

This is one of the points that it is really important in order to have a good final result for end users. It is good to make a list with all the controller types uploaded. Asset configuration is used to set up the following points in the controllers:

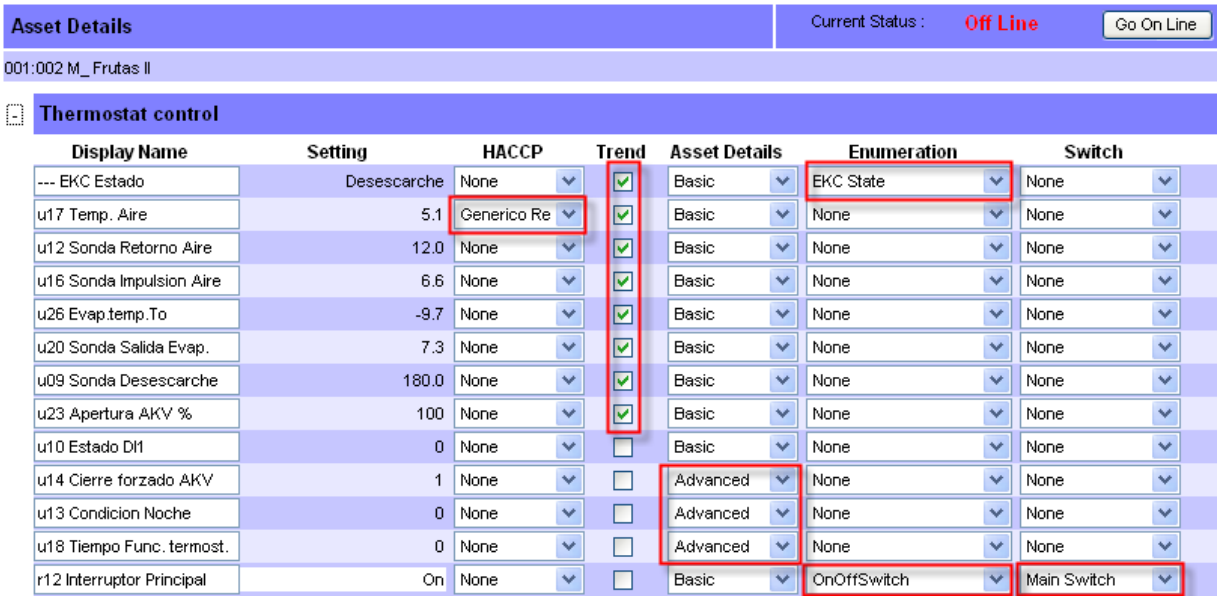
| Display Name | Setting | HACCP | Trend | Asset Details | Enumeration | Switch |
|---|---|---|---|---|---|---|

- ✓ **Display Name** → This is the parameter name and it can be changed. This name is used for all the menus and also to make mimics. Usually, these names will appear in different languages for AKC & AK2 controllers if available. In EKC controllers it is possible to translate the name. Try to keep the numbers for EKC parameters, (i.e. *u17* Ther Air), they are useful for standard mimics and objects.

***Practical note 9a:*** *if you make a mistake, it is possible to read the original parameter by deleting all the characters and pressing Enter.*

- ✓ **Setting** → stored value for the parameter.
- ✓ **HACCP** → HACCP type for the parameter, food types created in Point 5 can be used.
- ✓ **Trend** → These parameters will be available for trend analysis
- ✓ **Asset Details** → It is possible to make a selection of parameters in each controller in order to have an overview. These will be shown in Basic Asset Details and the remainder will be shown in Advanced Asset Details.
- ✓ **Enumeration** → This feature is used to "translate" numbers into text. Please refer to point 6 of this guide.
- ✓ **Switch** → It is possible to select different switches to make an override to certain parameters. The default switches are "Main Switch" and "Defrost Switch". Both functions must be selected to be available from the Mimic View.

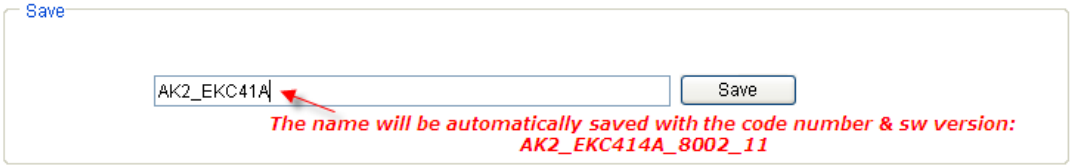
This is an example of Asset Configuration (EKC 414A):




| Display Name | Setting | HACCP | Trend | Asset Details | Enumeration | Switch |
|---|---|---|---|---|---|---|
| --- EKC Estado | Desescarche | None | ☑ | Basic | EKC State | None |
| u17 Temp. Aire | 5.1 | Generico Re | ☑ | Basic | None | None |
| u12 Sonda Retorno Aire | 12.0 | None | ☑ | Basic | None | None |
| u16 Sonda Impulsion Aire | 6.6 | None | ☑ | Basic | None | None |
| u26 Evap.temp.To | -9.7 | None | ☑ | Basic | None | None |
| u20 Sonda Salida Evap. | 7.3 | None | ☑ | Basic | None | None |
| u09 Sonda Desescarche | 180.0 | None | ☑ | Basic | None | None |
| u23 Apertura AKV % | 100 | None | ☑ | Basic | None | None |
| u10 Estado DI1 | 0 | None | ☐ | Basic | None | None |
| u14 Cierre forzado AKV | 1 | None | ☐ | Advanced | None | None |
| u13 Condicion Noche | 0 | None | ☐ | Advanced | None | None |
| u18 Tiempo Func. termost. | 0 | None | ☐ | Advanced | None | None |
| r12 Interruptor Principal | On | None | ☐ | Basic | OnOffSwitch | Main Switch |

Once one controller has been completed, the work can be saved in a file and restored in other AK-EM 100 projects. It is **also possible to copy from one controller to others.**

*9.1 Back-up of an asset (controller type): It is possible to make a back-up file containing all the settings that have been made.*

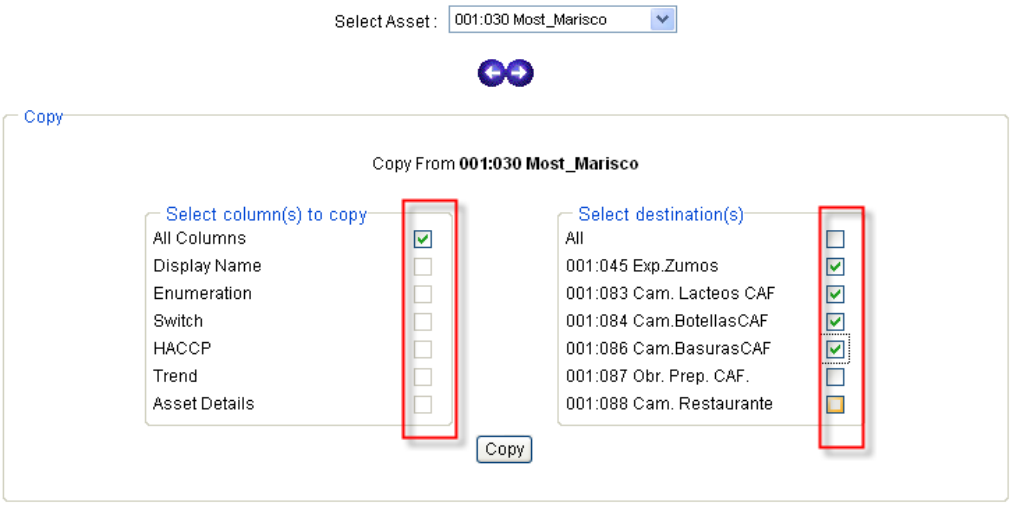



***Practical note 9b:*** *The same controller connected to an AKA245 or SM will* ***be different for the AK-EM 100****, so it is quite important to enter a file name for the file that can be remembered later on*

***Practical note 9c: File names cannot be changed*** *later from within Windows because these same files will not work when trying to restore in other AK-EM 100 projects.*

*9.2 Restore from one file to a specific controller: if you want to use your files in other AK-EM 100 It is necessary to first upload the files from your computer*


*9.3 Copy an asset to several controllers: it is possible to copy from one asset to several others but this can take some time.*




***Practical note 9d:*** *Usually, every controller type will have the same asset configuration for frozen food or refrigerated food, so all settings can be copied to the same controller types, and can then be differentiated in terms of Food Types (HACCP).*

***Practical note 9e:*** *For AK2 controllers connected to **SM**, the same code number has different "files" in the AK-EM 100, depending on the application selected; (for instance AK-PC 840 with 4 compressors is not the same as AK-PC 840 with 5 compressors). In this case, copying from one controller to another is NOT recommended because some parameters will be corrupted. AK-EM 100 upload from the controller in the existing configuration, it means that if somebody changes the configuration in one controller it is necessary to upload the network again.*

# 10. MIMICS

This chapter is one of the most difficult to explain because everyone can make and think mimics in their own way. The purpose of this Guide is to give some guidance to engineers in their work. It is possible to **learn more about mimics** in the ***Commissioning Guide for AK-EM 100 (RC8BX202).*** There are several issues affecting this area:

*10.1 Pictures → all pictures have to be uploaded into AK-EM 100 from a computer. It is possible to upload background pictures and general pictures. Pictures size depends on the screen resolution, so there is no one pre-defined size for all pictures. Here we have some examples for different screen resolutions:*

| *Screen resolution* | *Image resolution* |
|---|---|
| *1024x768* | *865x505* |
| *1280x1024* | *1120x775* |
| *1600x1200* | *1440x950* |

*10.2 Templates→ templates are used in the AK-EM 100 to save time when working with controllers. Once template is based in the parameter name, it can be used for different controllers types (this is not possible in AKM), and so one template can be created for several controllers, (see Appendix B to learn more about templates).*

*There are two different types of templates:*

- *Object templates → no picture is included*
- *Mimic templates → a picture is included (background)*

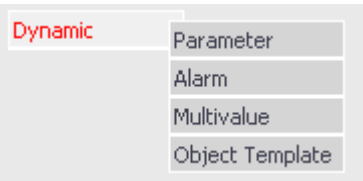
> ***Practical note 10a:*** *In the current 1.5.01 release all the factory templates are based on the English language and so most of them cannot be used in non English-speakingcountries. Remember that AKCs & AK2 controllers are uploaded in your preferred language, which is why it is not possible to use factory default mimics.*

*10.3 Mimics → it is possible to have two different mimics in the AK-EM 100:*

- *Mimics based on templates, if a controller template is created in the AK-EM 100. several mimics can be linked to it, but it is necessary to create all the specific mimics for each controller.*
- *Mimics layouts with background: these mimics are used to show different parameters from the controllers. The top level mimic (AK-EM 100 SITE) must be creadted and the rest of the mimics are linked to it.*

*10.4 Values that can be added in Mimics & Templates → in order to make mimics more and more professional, we have some graphical tools can be used:*

- *Dynamic values: we can add the following items to a mimic. Please refer to Appendix C to learn more about Multivalue.*

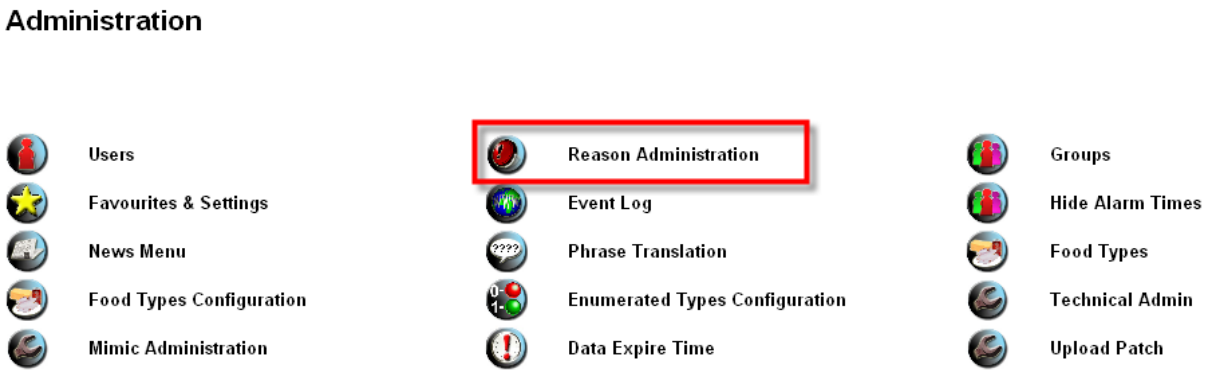



> ***Practical note 10b:*** *Sub-mimics can only be linked from parameters, not from object templates. If object templates are being used, the best option is to link Basic Details from the Object templates*

- *Fixed Values: it is possible to add an image or annotations*

## 11. ALARM REASONS (MANAGEMENT)

Alarm Reasons is used in the AK-EM 100 to receive and customize alarm texts from the controllers. All the reasons (alarms) have to be configured in the following menu:




We have two different reasons (alarms) in the AK-EM 100:

- Raw Reasons → default texts from the controllers. These reasons will come with the texts and language selected in the specific controllers. All the EKC controllers will send alarms in English only.
- Standard Reasons → these comprise customized text for the raw reasons, which can, of course, be translated into your local language. It is possible to link the same Standard Reason to a different Raw Reason in order to have cohesion between different controllers.

| | ***Raw Reasons*** | ***Standard Reason*** |
|---|---|---|
| 493 | --- High t.alarm | Temp. aire ALTA |
| 479 | --- High temp. | Temp. aire ALTA |
| 503 | --- HighTemp air | Temp. aire ALTA |

***Practical note 11a:*** *Only alarms that have been received in the AK-EM 100 can be assigned to a Standard Reason, which in turn, means that only alarms that have been received in the AK-EM 100 can be translated.*

*If an* ***AK-EM 100 back-up*** *has been created, all the texts will remain when this file is restored in another AK-EM 100.*

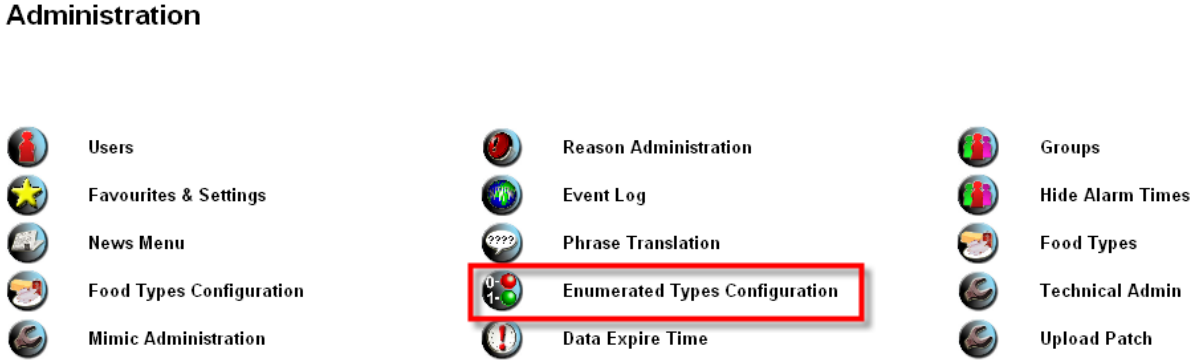
## 12. SUMMARY-BACKUP

At this point, the AK-EM 100 has been fully set-up and a full backup of your project is recommended. Remember that with the current 1.5.01 release, an entire back-up of the box will be undertaken, including MIMICS, ASSET CONFIGURATION, ALARMS & REASONS, ENUMERATION, CONTROLLERS LIST and HACCP.

***Practical note 12a:*** *Please check carefully the entire HACCP configuration after restoring a project; sometimes some food types are lost.*

***Practical note 12b:*** *It is a good idea to make a back-up of the first site and use it in other sites with the same configuration.*

## Appendix A – ENUMERATION, how to add a new enumerated status




As we have seen enumeration is used to "translate" numbers into text. This is a very powerful tool to show end user's how easy it is for them to view values. Let's see an example of enumeration for a pack controller, AK-PC 840 and how we can show the status for compressors and neutral zones.

If we look into the AK-PC 840 manual, these are the equivalences between numbers and status:

| | | |
|---|---|---|
| AK-PC Neutral Zones | | |
| | 0 | Po Error |
| | 1 | Zona -- |
| | 2 | Zona - |
| | 3 | Zona Neutra |
| | 4 | Zona + |
| | 5 | Zona ++ |

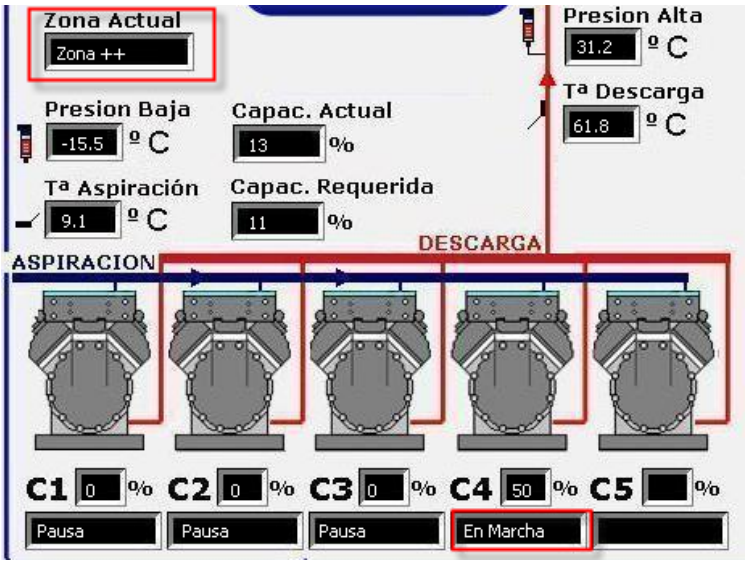
Here we have another example for compressor status in AK-PC 840:

| | | |
|---|---|---|
| AK-PC Estado Compr. | | |
| | 0 | Arranque |
| | 1 | Parado |
| | 11 | En Marcha |
| | 2 | Manual |
| | 3 | Alarma |
| | 4 | Reinicio |
| | 5 | Pausa |

Now let's see the parameters affected in Asset Configuration:

| Display Name | Setting | HACCP | Trend | Asset Details | Enumeration | Switch |
|---|---|---|---|---|---|---|
| Compresores (Temp) | -7.9 | Central Refri | ☑ | Basic | None | None |
| Compresores (Ref) | -13.0 | None | ☑ | Basic | None | None |
| Compresores (Estado) | En Marcha | None | ☐ | Basic | AK-PC Estado Compr. | None |
| Condenser 1 (Temp) | 30.5 | None | ☑ | Basic | None | None |
| Condenser 1 (Ref) | 32.0 | None | ☐ | Basic | None | None |
| Condenser 1 (Estado) | 5 | None | ☐ | Basic | None | None |

And of course in the mimics:



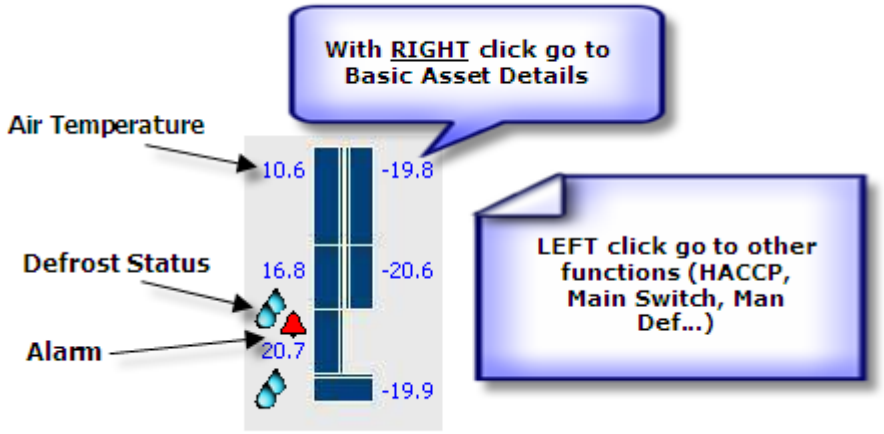
## Appendix B – MIMIC and OBJECTS TEMPLATES

As already stated, there are two different types of templates in the AK-EM 100:

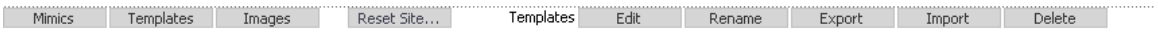
***B.1 Object TEMPLATES*** → As we know object templates cannot include pictures, but can, of course, include: values, alarms, dynamic values and links. Working with objects will save set-up time, because objects that can be used for several controller types can also be used for instance, for EKC 202D, EKC 414A, AK-CC 550, etc.

All the values shown in templates are based on parameter names that are in the Asset Configuration (be careful with translations), and it is possible to use the percentage symbol (%) like a wildcard. Let's see an example for an object template used for EKC Controllers:

1) In this case, an object called AK1-AK2 EKC Generic has been created to show the temperatures, alarms and defrost status for EKC controllers. These are the values and actions that we want to show:

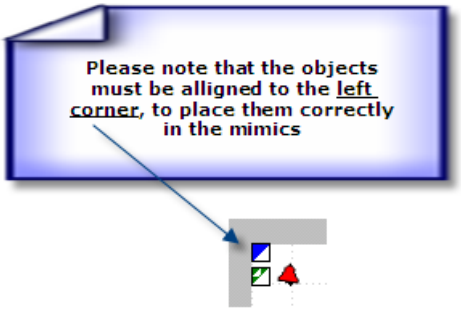



2) Then go to the Template Editor to see how it is programmed



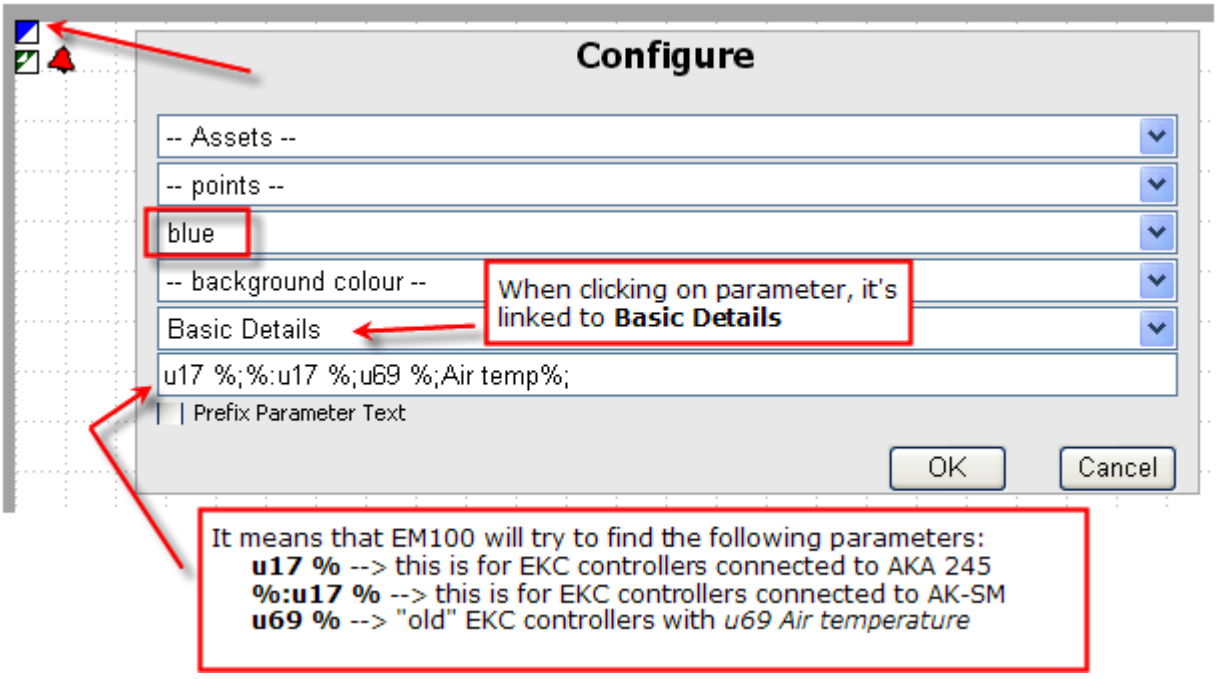

**Mimic Administration**


Let's see how this object is created with the Template Editor:

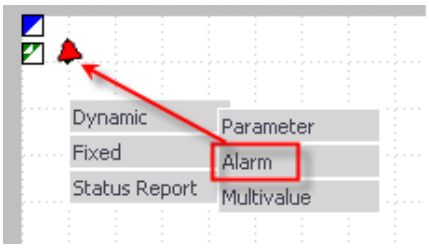



Now let's see how it has programmed each value:

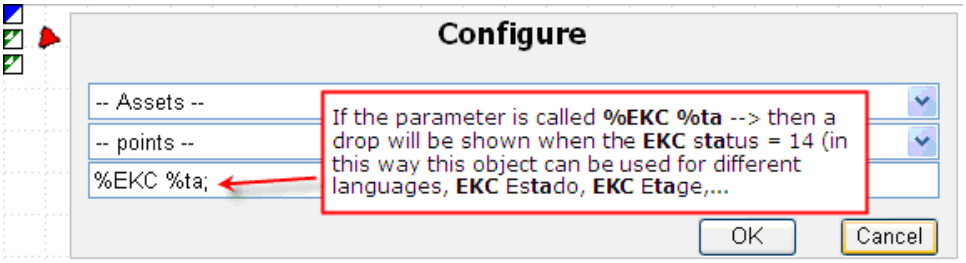
- Air Temperature

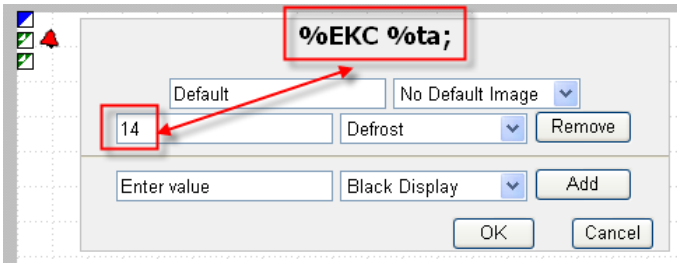



- Alarm



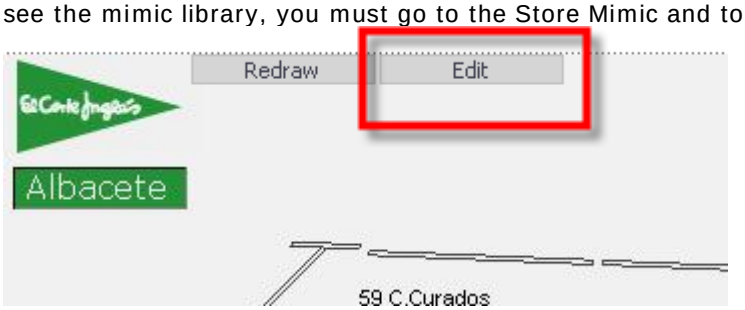

- Defrost Status, in this case we have **one icon** to show the same parameter for different controllers.



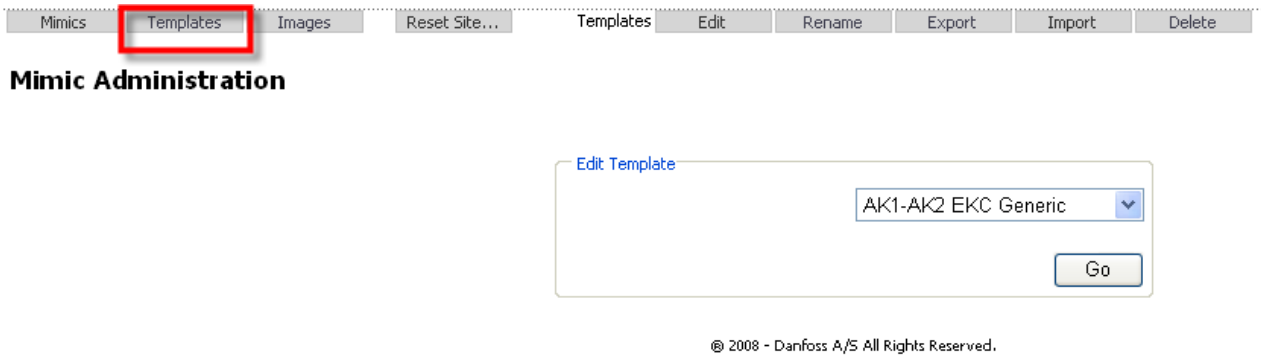



***B.2 Mimic Templates*** → Mimics are created in the same way as Objects templates but they include pictures to make them more users-friendly.

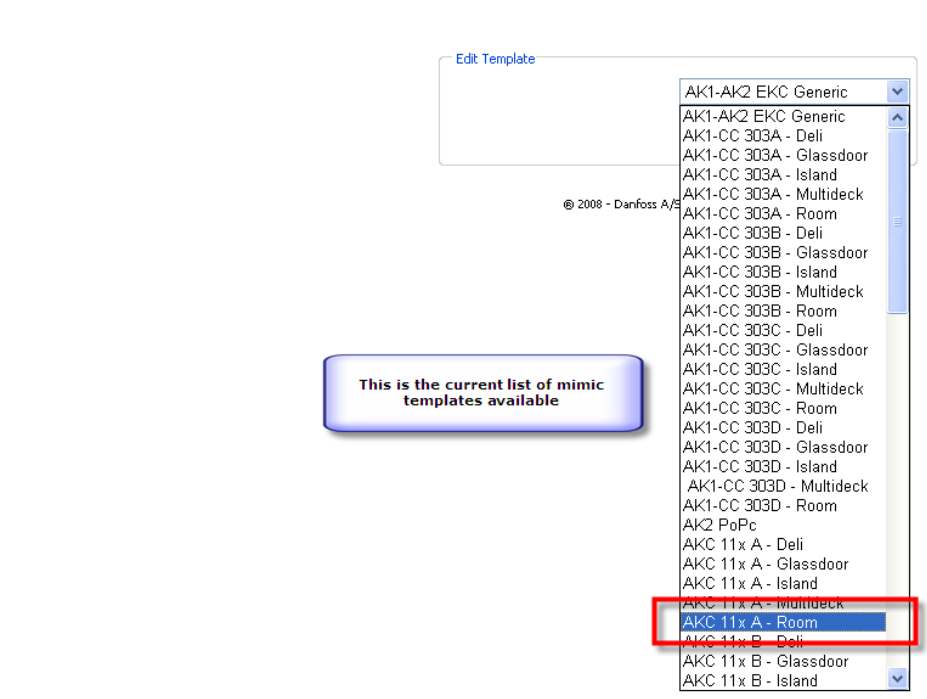
The mimic library in the AK-EM 100 is for mimics based on the English language. It means that those mimics only work correctly if the controller contains English text. If you want to see the mimic library, you must go to the Store Mimic and to Edit…



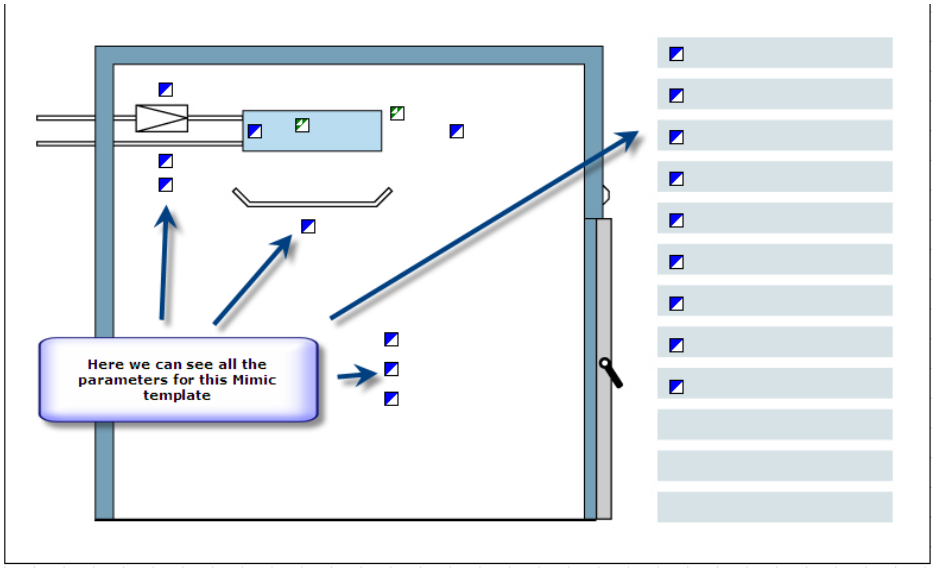

Then you look in the Templates (here you will find Objects & Mimics)



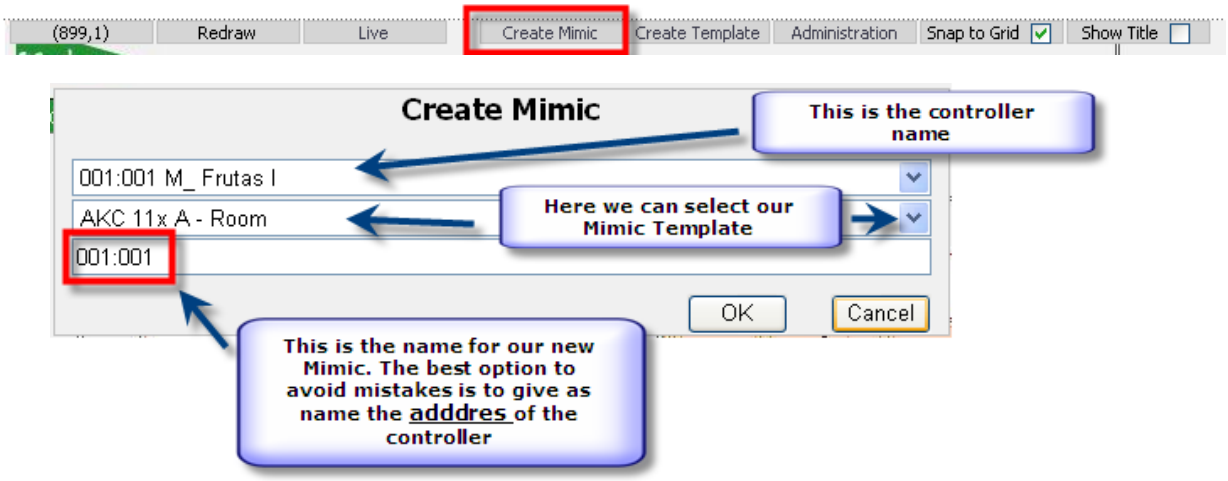

This is the Mimic Templates list…



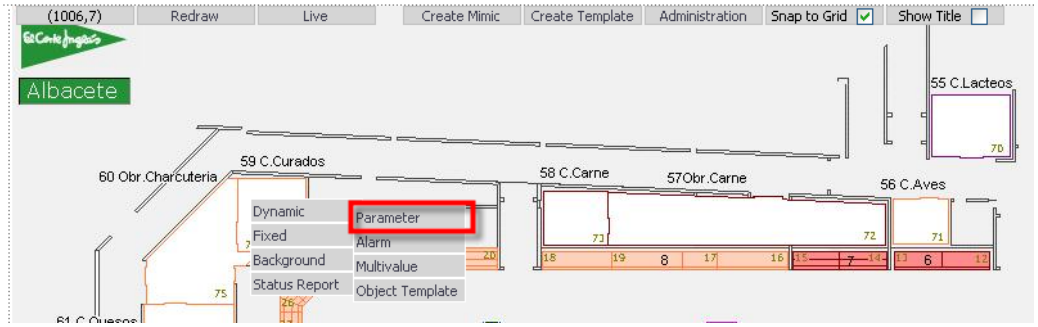
This is the mimic template for AKC11xA Room. The parameters are created in the same way as for Object Templates




Once the mimic template is in place, you MUST create a **new Mimic for EACH controller**. These mimics will be shown in the mimic list and can be linked to controllers.



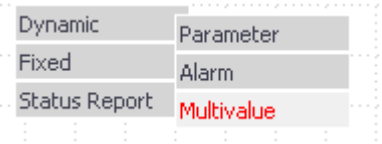

Now you can link the parameter from the Main Mimic (Store Mimic) to the controller mimic…

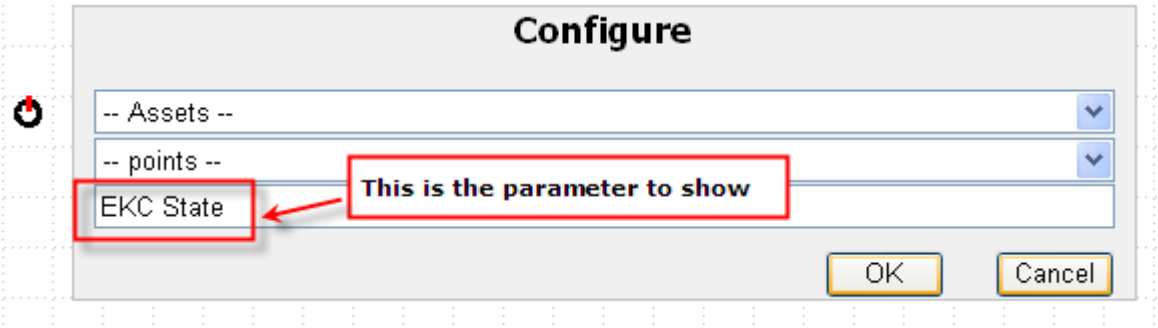


And then select the correct parameter and mimic.

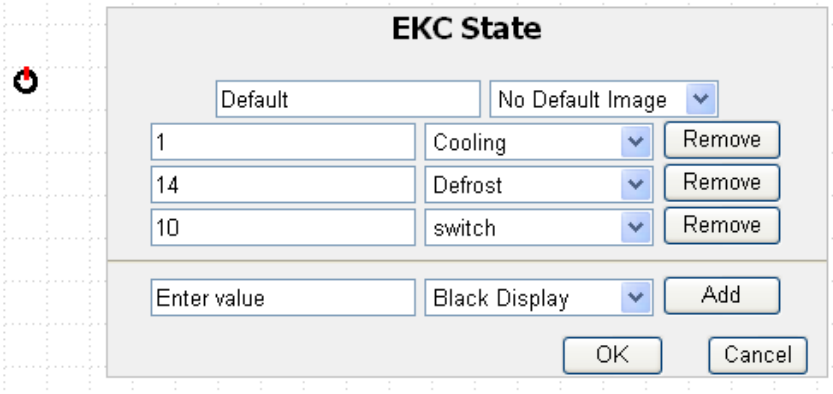
## Appendix C – Multivalue

Multivalue is used to show different icons/pictures in different values. This is useful for the End user to have an overview of the controller. First a parameter must be included:




Now every state needs to be assigned with the icon that you want to show…




You can see the values for each status…