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Danfoss AK-SM 800A ADAP-KOOL Refrigeration Control System

Danfoss AK-SM 800A ADAP-KOOL Refrigeration Control System User Guide

Contents

Danfoss AK-SM 800A ADAP-KOOL Refrigeration Control System

Document history

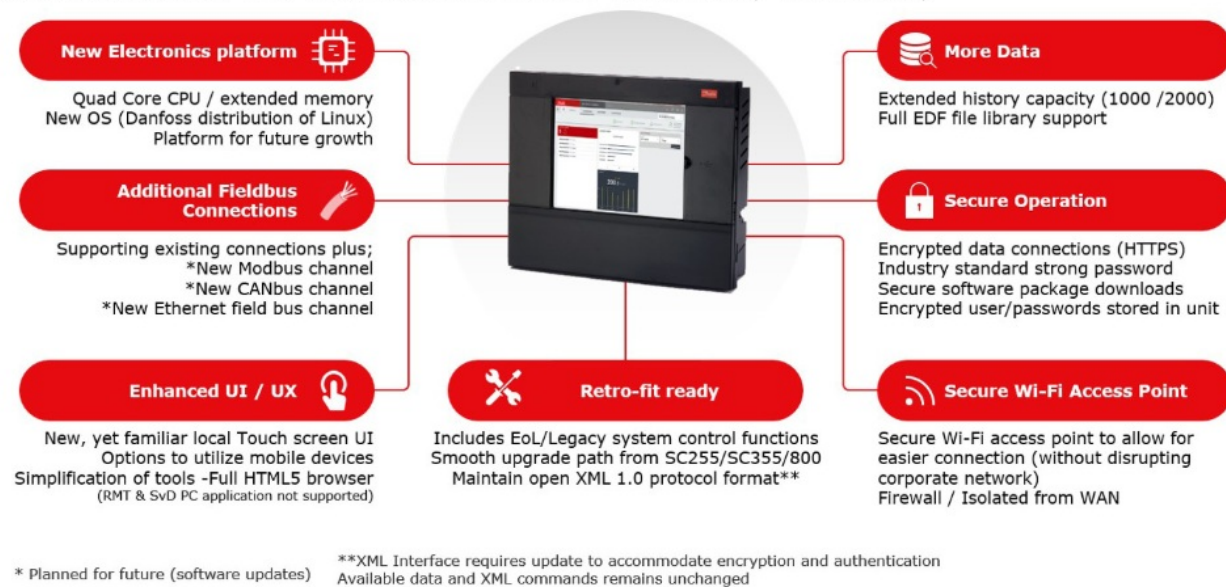| Description	Date
Original document	05.06.2020
• Updated document – AK-SC 255 to AK-SM 800A database upgrade steps	05.19.2020
• Updated document – Checklist updated	07.16.2020
• Updated document – Added important comment on SM 800 pre-conversion (Sec 3.1)	11.03.2021
• Updated document – Minor updates	18.02.2022
• Updated document – Updated AK-SM 800A connection image	21.04.2023
• Updated document – Added note for AK-SM 800 - AK-SM 800A conversion	15.04.2024

Scope

This document is provided with the intent to cover installation and operational actions associated with replacing existing and functioning AK-SC 255 / SM 800 units with AK-SM 800A. This document assumes the reader has detailed knowledge of Danfoss systems and is qualified for all work activities outlined in this document. Ground up commissioning of the AK-SM 800A is not covered by this document, rather the conversion of existing AK-SC 255 units is assumed.

Introduction to AK-SM 800A / Comparison to AK-SC 255

Product highlights – AK-SM 800A

A major upgrade with focus on performance, connectivity and security

New Electronics platform

Quad Core CPU / extended memory
New OS (Danfoss distribution of Linux)
Platform for future growth

Additional Fieldbus Connections

Supporting existing connections plus;
*New Modbus channel
*New CANbus channel
*New Ethernet field bus channel

Enhanced UI / UX

New, yet familiar local Touch screen UI
Options to utilize mobile devices
Simplification of tools -Full HTML5 browser
(RMT & SvD PC application not supported)

Retro-fit ready

Includes EoL/Legacy system control functions
Smooth upgrade path from SC255/SC355/800
Maintain open XML 1.0 protocol format**

More Data

Extended history capacity (1000 /2000)
Full EDF file library support

Secure Operation

Encrypted data connections (HTTPS)
Industry standard strong password
Secure software package downloads
Encrypted user/passwords stored in unit

Secure Wi-Fi Access Point

Secure Wi-Fi access point to allow for
easier connection (without disrupting
corporate network)
Firewall / Isolated from WAN

* Planned for future (software updates) **XML Interface requires update to accommodate encryption and authentication
Available data and XML commands remains unchanged

AK-SC 255 (end of life 2016)	AK-SM 800A Solution
Uses AKA65 for remote access	Secure Full web browser (Chrome / Safari)
KeyPad local access	Touch screen
Weak Passwords (i.e. supervisor, 123)	Strong password (industry best practice)
Full centralized Rack / Pack control	Full centralized Rack / Pack control
AK I/O	AK I/O
600 history points	1000 status 2000 event
Danfoss Alsense digital services	Danfoss Alsense digital services
Offline programming	Not available
XML1.0 open interface	XML1.0 open interface (with requirements for encryption)

AK-SC 255	Corresponding AK-SM 800A
AK-SC 255 Screen TP78 (Full License) - 080Z2502	AK-SM880A TP78 - 080Z4029
AK-SC 255 Alarm Logger - 080Z2530	N/A
AK-SC 255 Screen RS485 (Full License) - 080Z2521	AK-SM880A RS485 - 080Z4028

Key steps and procedures

AK-SC 255 / SM 800 preparation

Before starting any work or removal of systems please alert any remote services that may actively be monitoring the site.

Pre-installation

- Record and document any current or recently active alarms in the SC255 systems
- Record and document IP configuration for all units
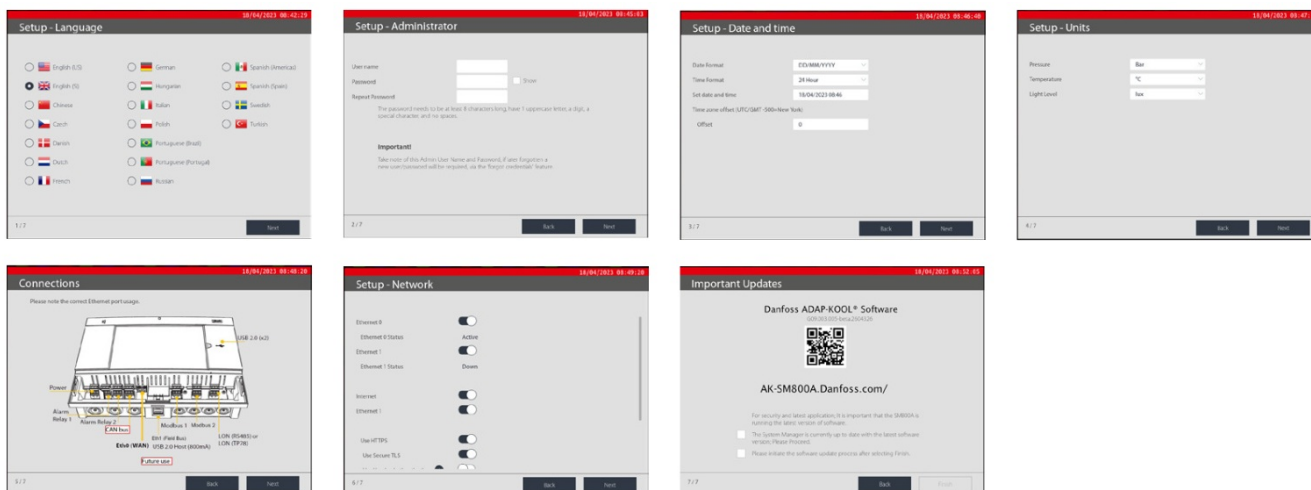- Save history (if required) by using the AKA65

- Verify all nodes are on-line
- Note existing wiring configuration, especially for field bus. Note that the SM800A has x4 TP78 connections
- Based on customer requirements, note all relevant users and passwords configured in each AK-SC 255, as these will be required for SM800A"
- Review all AK-SC 255 systems for any points (Relay/Digital/Sensors) with override or offsets applied
- All AK-SC 255 units must have v2.231 or later. Upgrade all AK-SC 255 if required
- Save each AK-SC 255 database on a USB flash drive and label accordingly, this will later be used for the upgrade process.
- On SM 800 systems, ensure Modbus TCP is set to disabled. Failure to have this channel disabled prior to database conversion will effect the network node scan operation of the AK-SM 800A.

AK-SM 800A pre-Flight

Tip: Keep the AK-SC 255 systems running until all checks and verifications are complete and the units are ready for swap over.

Pre-installation

- Prior to power up set the host network rotary address switch to match the AK-SC 255 being replaced
- Power up the AK-SM 800A units and complete the 'pre-flight' wizards, this WILL require the use of a new admin user and password2)
- User accounts and associated passwords will not be copied from older systems – add new SM800A users/passwords and ensure all AK-SM 800A units are the same if used on a host network
- AK-SM 800A now includes (from software package 4.0 and above) Session Control which is enhanced security for remote connections. Ensure all units on an AK-SM 800A host network have the same Session Control setup.
- As part of the pre-flight wizard, set time and date and enter in the IP addresses used in AK-SC 255 units
- Complete the pre-flight wizard and set the host address rotary address switch according to requirements
- Update software – See appendix for detailed information on updating software on the AK-SM 800A
- Post Pre-flight (currently logged in), navigate to Configuration → System → Users and enter all users and passwords per customer specification

Pre-flight wizard

1. It is recommended that strong passwords are used – if original passwords are to be used, the weak password

option will need to be enabled in the SM800A Users screen.

2. It is recommended to keep note and document this admin user as part of the project documentation. If this code is lost Danfoss is unable to recover and a new password will need to be requested.
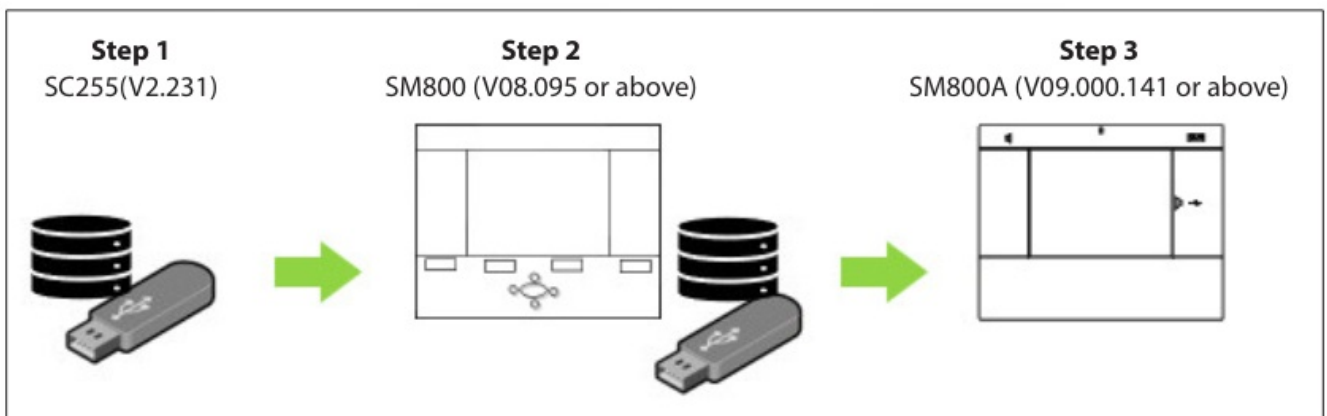
Convert 255 database to SM800A

Tip: Keep the AK-SC 255 systems running until all checks and verifications are complete and the units are ready for swap over.
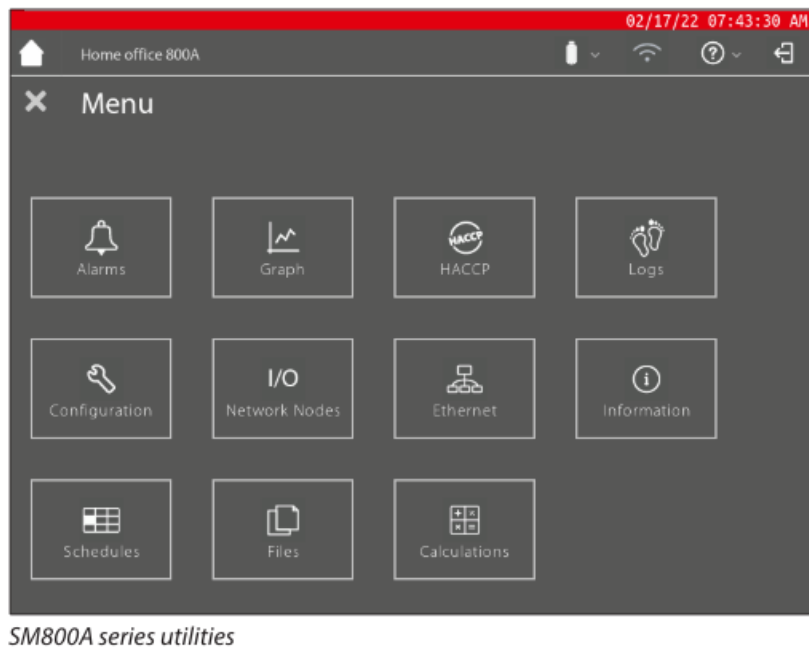
Pre-installation

- Save the AK-SC 255 database to a USB flash drive (min v2.231 on AK-SC 255).
- Insert above USB Flash drive into the AK-SM 800 series (NOT SM800A!) and select database import via the USB Menu.
- Go to "Menu" (located on keypad) and select information from the menu. Items not converted will be listed here and require manual entry.
- Review database using AK-SM 800 for any non-typical entries. Names, etc that did not cleanly convert.
- Save the AK-SM 800 series database to the USB Flash drive.
- Insert above flash drive to the AK-SM 800A series and select "import database" under the USB menu option. The AK-SM 800A auto converts the SM800 database, upon completion the AK-SM 800A will reset.

Notes

- To establish Host Network connection, go to Utilities and select Ethernet. Select Configuration and select the "Initialize" option.
- If a SM800A host network is being used, make sure all units have common user-level access and passwords applied. This will ensure full visibility when connecting with the StoreView Browser.
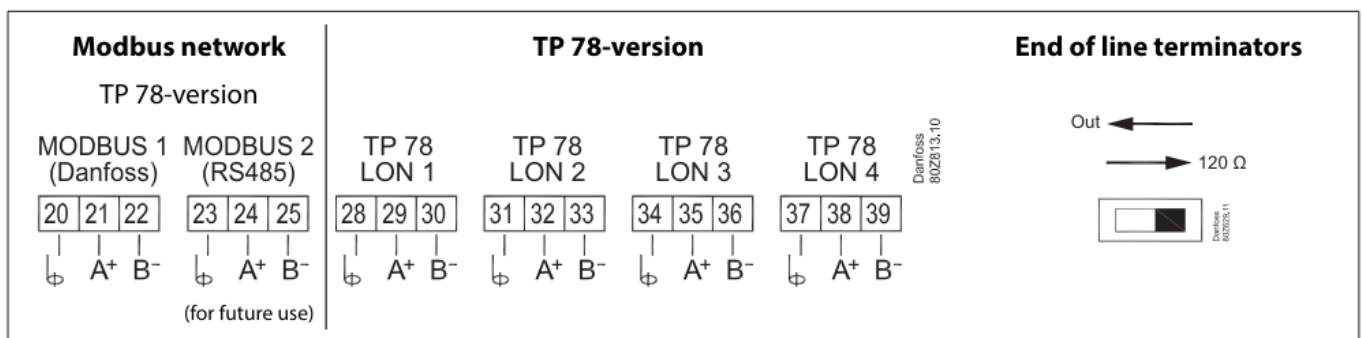

| Step 1 | Step 2 | Step 3 |
| SC255(V2.231) | SM800 (V08.095 or above) | SM800A (V09.000.141 or above) |

SM800A series utilities

SM800A series utilities

Tip: Don't forget to switch 'on' the end of line network terminators

Installation

- Make suitable disconnect of the AK-SC 255 and mount the AK-SM 800A
- Ensure all connectors are in place
- Perform network scan
- Perform device upload (if application has generic devices)
- Check general operation
- Perform test alarms and ensure Danfoss Enterprise Services/ Monitoring company has received
- Enable History and configure new if required

Site Checklist –New Install

800A preflight

- **Important:** Units must be running with version G09.000.141 or later before proceeding.
- Prior to power up- Set the Host address rotary address switch to match AK-SC 255 being replaced. → Power up the AK-SM 800A units and complete the 'pre-flight' wizards. This requires the use of a new STRONG admin
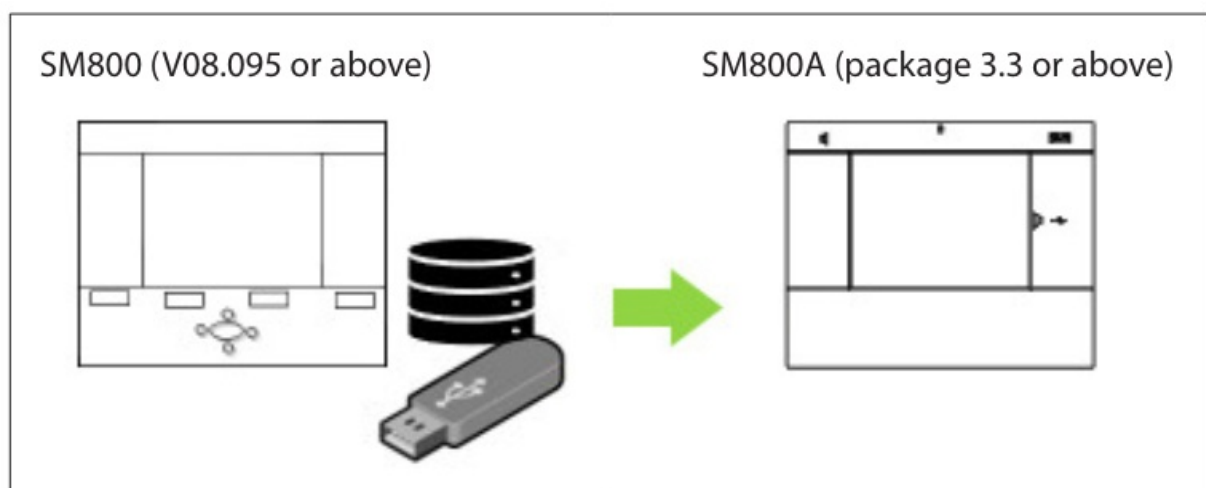
user and password.

- All units on an AK-SM 800A host network must have the same User / Passwords. Also, all units must have the same Security settings (Configuration → Security).
- Suggestion: take a picture of the user name and strong password before proceeding. This information is critical for logging in.
- Set time and date correctly at this time to ensure lights function properly.
- As part of the pre-flight wizard, enter in the IP addresses supplied by the customer (if applicable).
- Complete the pre-flight wizard- Pay close attention to the connection diagram for network connection. → Update software – See appendix for detailed information on updating software on the AK-SM 800A. … Post preflight, and already logged in, go directly to Configuration → System → Users and enter customers' users/passwords per their guide.

Installation

- Mount the AK-SM 800A.
- Ensure all connectors are in place.
- Perform network scan as needed.
- Perform device upload (if the application has generic devices).
- Check general operation (all connected devices are online, temperatures and pressures are reading, no alarms).
- Enable History and configure new if required.
- Enable alarm dialogue feature. Go to Configuration → Alarms → Connection. Activate and review parameters.
- Perform test alarms and ensure Danfoss Enterprise Services and/or Monitoring company has received them.

Warning: Converting databases from systems that are structurally different (i.e. 255 to 800 to 800A) may end in unexpected results. Thoroughly check the converted database for any errors and unexpected configuration changes. Due to the complexity of managing different system structures, it may be necessary to delete the converted database and re-program from scratch.

Note: For AK-SM 800 to AK-SM 800A conversions, follow the same principles as described for AKSC255 to 800A conversion, skipping the steps surrounding the SC255. Again, pay close attention to the resulting converted database, due to the AK-SM 800 and AK-SM 800A being structurally different control devices, with different operating systems and databases. Observe the warning noted above!

Site Checklist – Retrofit

Pre-installation

- Record and document any current or recently active alarms in the SC255 systems.
- Record and document IP configuration for all units.
- Ensure SM 800 systems have Modbus TCP set to disabled (Config → Network node screen)
- Save history (if required) by using the AKA65.
- Verify all nodes are on-line.
- **Note:** Existing wiring configuration, especially for field bus. Note that the SM800A has x4 TP78 connections.
- RECORD all relevant users and passwords configured in each AK-SC 255, as these will be required for SM800A-This does not carry over.
- Review all AK-SC 255 systems for any points (Relay/Digital/Sensors) with override or offsets applied
- All AK-SC 255 units must have v2.231 or later. Upgrade all AK-SC 255 if required.
- Save each AK-SC 255 database on a USB flash drive and label accordingly as Unit 0, Unit 1, etc.

800A preflight

- Important: Units must be running with version G09.000.141 or later before proceeding. Used utilities feature to upgrade.
- Before power up Set the Host address rotary address switch to match AK-SC 255 being replaced.
- Power up the AK-SM 800A units and complete the 'pre-flight' wizards. This WILL require the use of a new STRONG admin user and password.
- Suggestion: take a picture of the user name and strong password before proceeding. This information is critical for logging in.
- Set time and date correctly at this time to ensure lights function properly.
- As part of the pre-flight wizard, enter the IP addresses supplied by the customer (if applicable).
- Complete the pre-flight wizard- Pay close attention to the connection diagram for network connection.
- Update software – See appendix for detailed information on updating software on the AK-SM 800A.
- Post preflight, and already logged in, go directly to Configuration → System → Users and enter all users and passwords per customer standards.

Convert

- Save the AK-SC 255 database to a USB flash drive (min v2.231 on AK-SC 255).
- Insert the above USB Flash drive into the AK-SM 800 series (not 800A) & select database import via the USB Menu.
- Log into the AK-SM 800 and go to "menu" on the keypad and select "Information" to view items that did not convert from AK-SC 255.
- Review the database in the AK-SM 800 for any non-typical entry ie; Naming conversion that did not convert the same.
- Save the AK-SM 800 series database to the USB Flash drive.
- Insert the same flash drive in the AK-SM 800A and select "import" database under the USB menu. The AK-
- SM 800A will auto-convert and reset.
- **Note:** If an SM800A host network is used ensure all units have the same user-level access and passwords. This ensures full visibility when connected.

- Once installed: To establish a Host Network connection go to Utilities and select Ethernet. Go to "Configuration" and select the "Initialize" option.

Pre-installation

- Make a suitable disconnect of the AK-SC 255 and mount the AK-SM 800A.
- Ensure all connectors are in place.
- Perform network scan as needed
- Perform device upload (if the application has generic devices).
- Check general operation (all connected devices are online, temperatures and pressures are reading, no alarms).
- Enable History and configure new if required.
- Enable alarm dial-out feature. Go to Configuration → Alarms → Connection. Activate and review parameters.
- Perform test alarms and ensure Danfoss Enterprise Services and/or Monitoring company has received them.
- Reinstall any required manual operations and offsets.

Appendix

Software update

Software update function – an introduction

Like many other modern electronic devices, you must maintain your AK-SM 800A with up-to-date software. Danfoss has a policy of continued improvement and enhancement and will regularly offer updates to your system. These updates will include bug fixes, new enhancements and important updates for security vulnerabilities. Updates can be categorized as 'recommended' or 'mandatory', with supporting documentation describing the categorization. The following section describes the Software Upgrade feature, found in the utilities app. Use this feature to remotely update your AK-SM 800A series controller.

Operational scope and Important notes

Once connected to your AK-SM 800A series controller you will have access to the Utilities App. The Software Upgrade function is currently designed for single SM800A units only. For example, if you have a host network of multiple units, ensure you connect to the actual unit (IP address) that you intended to update. To update other units on the host network, be sure to log into that unit's unique IP address and follow the same workflow.

The software packages available for your AK-SM 800A have unique assigned 'digital signatures', this signature is then validated by the AK-SM 800A to ensure the file has not be altered or tampered with. Any software package that is modified will be rejected by the AK-SM 800A and an update will not be possible

Important

- Whilst upgrading your system, power must not be interrupted at any time during the update process. Any power loss during the update procedure may cause permanent damage or corruption to your AK-SM 800A series.
- In host network applications (multiple interconnected AK-SM 800A units) it is required that ALL units have the same software installed. Failure to do so may result in unexpected behavior and may affect control and monitoring of your store.

Note: To download the latest software package for your AK-SM 800A series controller, visit **http://www.ak-sm800a.danfoss.com**/

Utilities – Software update function
The software update utility offers two methods of updating, Local Stored File and Web Connectivity (note, in addition to using the Utilities, any of the USB ports on your AK-SM 800A can also be used toupdate software via a flash memory stick).

Local Stored File: This method assumes you have previously downloaded a software package from **http://www.ak-sm800a.danfoss.com**/ and this package is located on the device you are using to access your AK-SM 800A / SvB5.
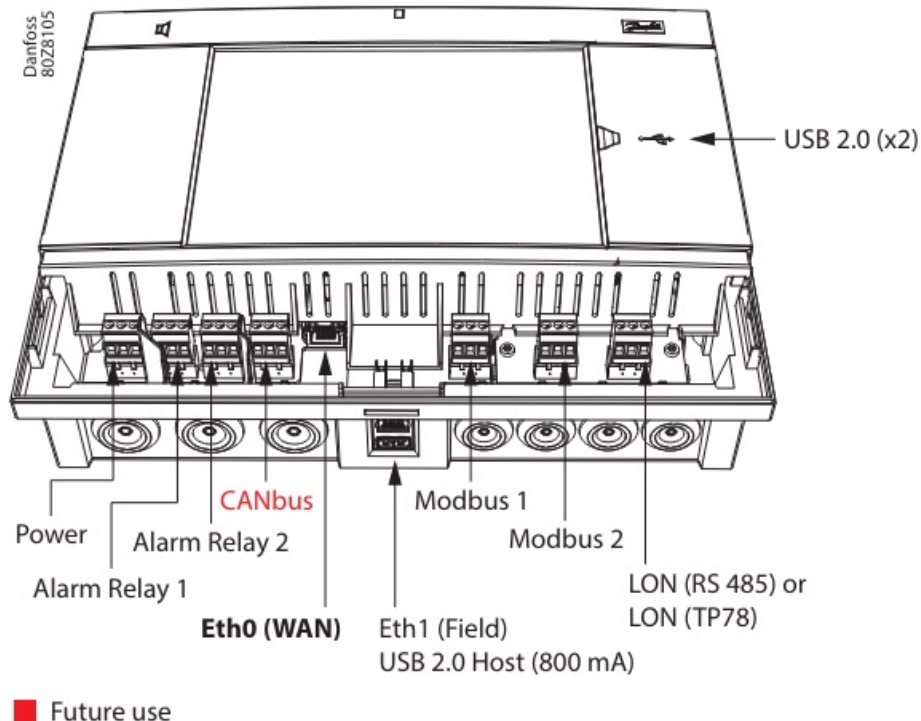
- Click on the Local Stored File option and select the software package via the 'Choose File' button. The file type is SPK (Software Package)
- Press the Upgrade SM800A button to initiate the package download to the SM800A
- After the package has been downloaded and checked for integrity, press the install button to execute the update. Note: During the update process, your AK-SM 800A will reset, this will temporarily disconnect your connection. Press the browser refresh to reconnect after ~3 minutes.
- An upgrade Log will appear, with the final status 'Software upgrade SUCCESSFUL!', press the Home button to get back to the Utilities.

Web Connectivity: This method assumes you have connected to your AK-SM 800A via a device that has access to the Internet. Selecting this option will use your Internet connection to retrieve the latest AK-SM 800A software package (from secure Danfoss software server) and with the live browser connection to the AK-SM 800A unit, will update the software. Follow the screen prompts to perform a software update via a web-connected device. (NOTE: At this time Apple® based platfrom(s) do not support the web connectivity function, if using an Apple® device, use the Locally stored file option described above).

Operating System (Danux)
This function follows the same principle as described above for software update, but supports the updating of the System Managers operating system (OS). Your AK-SM 800A utilizes a Linux-based distribution, specifically for Danfoss and like all software systems, updates may be required for feature or security reasons.

Connectivity

Disclaimer:
Converting databases from systems that are software structurally different (i.e. AK-255 to AK-SM 800 to AK-SM 800A or AK-SM 800 to AK-SM 800A) may end with unexpected results.

Thoroughly check the converted database for any errors and unexpected configuration changes.
Due to the complexity and significant software difference between these system managers, it may be necessary to correct/delete the converted database and re-program Known issues: some controllers that have been configured on the AK-SM 800 may not convert correctly to AK-SM 800A due to the difference in device file format. An example is the AK-CC55 case controller that has a structurally different device file in AK-SM 800 than in AK-SM 800A and cannot be converted.

Documents / Resources

Danfoss AK-SM 800A ADAP-KOOL Refrigeration Control System [pdf] User Guide
AK-SM 800A ADAP-KOOL Refrigeration Control System, AK-SM 800A, ADAP-KOOL Refrigeration Control System, Refrigeration Control System, Control System, System

References

- **User Manual**