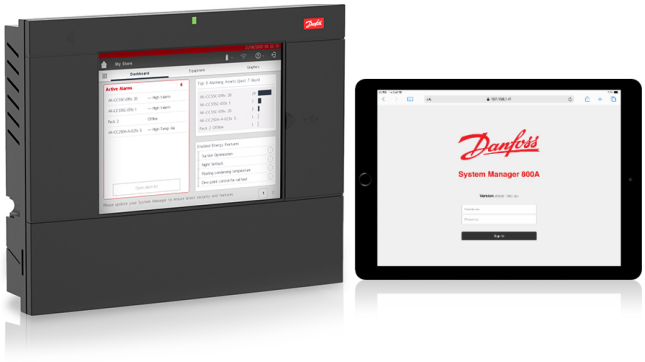
ENGINEERING
TOMORROW

Data Sheet

System manager
Type **AK-SM 800A series**

Global control and supervisory solution for food retail industry.



The System Manager controller from Danfoss is the global control and supervisory solution for food retail industry. The System Manager uses the latest technology to provide maximum benefit to the end user, both in terms of energy saving optimization, control options and full web user access.

Designed specifically for the food retail and food processing / handling market, the System Manager provides comprehensive functionality and support tools to cover small to large stores.

Features

Designed and created for Food Retail
- Built in control logic covering centralized (Rack I/O) and de-centralized (Pack, Case controllers) application formats
- Built in misc. boolean logic tool
- Built in energy optimizations providing continuous energy savings and efficiency
- Built in security for corporate connectivity
- Flexible alarm logic, monitoring and management
- Supporting full range of Danfoss devices
- Supporting 3rd party devices (non-Danfoss)
- Open data transfer (XML)

Versions
- AK-SM 820A Small store (Wi-Fi & no Wi-Fi versions)
- AK-SM 850A Refrigeration (Wi-Fi & no Wi-Fi versions)
- AK-SM 880A Full store (inc. lighting control)
- AK-SM 880A TP78 Retrofit (x4 TP78 channels designed for retrofit applications)

Connectivity
- x3 USB port connections
- Secure Wi-Fi access point for mobile devices
- Ethernet (x2)
- Multiple fieldbus connections and topology (LON, Modbus, RS485, Ethernet)
- Northbound (cloud / WAN)
- Southbound (field bus)

IT Security Best Practice
- Secure web connection (HTTPS)
- Secure e-mail, encrypted data and secure software update packages
- Vulnerability scan tested

Enhanced User Interface
- Color touch screen
- HTML5 based web browser support
- Quick Links menus help navigate faster though the system
- Wizards to improve setup work streams

Modern computing platform
- Responsive system performance
- Extended device support via increased system memory
- Extended log point collection for future view, export or sync with cloud

Remote interface / cloud integration
- Browser-based (HTML5) for online access through StoreView browser 5
- All new StoreView Web (SvW) support
- Operational efficiency through the Alsense Food Retail cloud platform and connected services.
- Open data access for enterprise systems

Product specification

Facts

Product highlights

- All new Electronics platform supporting new Operating System (based on Linux)
- Implementation of IT industry standard security protocols (HTTPS, SSL/TSL 1.2, WPA2 encryption)
- Full HTML5 web browser, known as StoreView Browser 5 (SvB5)
- New Utilities App (integrated in SvB5)
- Support of Mobile devices (Utilities App only)
- Retro-fit ready – includes EoL and legacy control functions supporting smooth upgrade path
- Extended History logging
- Secure Wi-Fi Access point – for site connection without disrupting WAN network

Design features

- Enhanced UI - new yet familiar touch screen
- Additional USB connections supporting flash drives.
- Built-in Wi-Fi access point

Hardware capability features

- Quad core processor
- Fieldbus support (Lon RS485, TP78, Modbus, SNMP, AK IP)
- Future utilization 2nd Ethernet, CANbus
- Connections (Ethernet, USB, Wi-Fi Access point, Alarm relays)

Technical data

Table 1: Technical data

AK-SM 800A version comparison	AK-SM 820A Small store	AK-SM 850A Refrigeration	AK-SM 880A Full
Refrigeration Control			
All AK-SM 800A variants come with Centralized I/O and Pack / Case control options. EKC AK2 SLV FC102	Max. 32 generic device support	Max 170 generic device - see Table 4: Specifications	Max 170 generic device - see Table 4: Specifications
Lighting Control			
All AK-SM 800A variants come with built in lighting control via I/O modules. The number of zones differ.	10	30	30
HVAC			
Only the AK-SM 820A and AK-SM 880A support built in HVAC control via I/O	10	n/a	45
Alarms (Active)			
Capacity	500	500	500
Miscellaneous points (via IO modules)			
Relay (R), Sensor (S), ON / OFF (O / F), Variable (V)	R=20, S=20, O / F=20, V=20	R=70, S=80, O / F=70, V=70	R=70, S=80, O / F=70, V=70
Master control			
Po Optimization, Master Schedules, AKC ON Note: Adaptive Defrost not currently supported	Yes	Yes	Yes
Misc Calculations			
Boolean Logic statements	96	96	96
History			
The AK-SM 800A has the ability to record datapoints for history and view.	3000 total points	3000 total points	3000 total points
History HACCP	200 total points	200 total points	200 total points
Leak Detectors			
Refrigerant gas detectors (connected via AK I/O)	10	50	50
Energy Meters			
Pulse Input (via I/O module), Carlo Garvazi, Wattnode, Wattnode Plus MODBUS, Veris MODBUS, Schneider PM3255 and iEM3250	32	80	80

Table 2: Generic capacity

Features	Max # of nodes	Modbus properties
Danfoss Modbus		
Danfoss Modbus controller devices (EKC, AK-CC, AK-PC 3,4,5x, MCX)	170 total across both channels	PARITY_EVEN, 38400, DATA_8_BITS
Danfoss gas sensors (DGS)	50	PARITY_EVEN, 38400, DATA_8_BITS
Danfoss SLV, WattNode Modbus (Modbus)	120	PARITY_EVEN, 19200, DATA_8_BITS
Danfoss SNMP		
Danfoss SNMP controller devices	160	n/a
Danfoss Lon (RS485/TP78)		
AK2 Multi-Case controllers (max per front end / no further generic devices allowed)	60	n/a
AK2 Pack Controllers	12	n/a
Danfoss Danbuss (Legacy AKC)		
Danfoss Danbuss via PI-200 (max X4 PI-200 per front end)	120	

Table 3: Generic capacity

Typical mix examples	Field bus deployment examples
Danfoss Pack (x12) + Danfoss Case (x158) = 170 max.	12 LonWorks, 120 Mod#1, 38 Mod#2
Danfoss Pack (x10) + Danfoss Case (x110) + Danfoss Gas sensors (x50) = 170 max.	10 LonWorks, 120 Mod#1, 40 Mod#2
Danfoss Pack (x10) + Danfoss AK2 Multi-Evap Case (x50) = 60 max.	60 LonWorks
Danfoss Rack I/O (x12) + Danfoss Case (x170) = 170 max.	LonWorks, 85 Mod#1, 85 Mod#2

NOTE:
Max. 120 Modbus nodes per Modbus channel (170 max. in total between Mod#1 and Mod#2)

Specifications

Table 4: Specifications

Data communication			
Ethernet (WAN/Host network)	1		
Ethernet 1 (AK-Pack IP field bus)	1		
USB	2 (Host) + 1 (800 mA)		
Wi-Fi (Point-to-point access)	1		
Alarm relays	2 Contact voltage: up to 240 V, Current rating: max. 5 Amp for AC-1 (Ohmic load), Max. 3 Amp for AC-15(inductive load)		
Field Bus Support			
RS485 Modbus	2		
RS485 LON	1		
TP78	4 (optional code #)		
CANbus	1 (future)		
Ethernet | 1 (Southbound fieldbus)	x1 Cloud / WAN		
Hardware specifications			
Enclosure	IP20		
Dimensions (WxDxH)	295 mm (11.6") x 65 mm (2.5") x 235 mm (9.3")		
Weight (gross)	2,408 kg		
WiFi transmitter			
WIFI Type	Wi-Fi Access Point		
Transmitter type	Wi-Fi 2.4 GHz / 5 GHz (IEEE 802.11a/b/g/n/ac)		
Transmit Frequency	2412 – 2472 MHz, 4900 – 5925 MHz (frequencies limited by Software)		
Receive Frequency	2412 – 2472 MHz, 4900 – 5925 MHz		
Antenna Gain	2.4 GHz gain: 1.8 dBi, 5 GHz gain: 4.9 dBi		
Communication standards	• Modbus • Lonworks • Danbus (via PI-200) • SNMP • AK-Pack IP controller (UDP/TCP)		
Ports open	**Description**	**Use**	**User Configurable**
5136	UDP	SNMP	No
1041	UDP	PI-200	No

443	TCP	HTTPS Secure Web browser communications	Yes
80	TCP	HTTP Web browser communications	Yes
5003, 5005	UDP	Host network communication UDP ports	No

Security

The System Manager 800A series has been designed to reside behind appropriately configured firewalls and secure LAN. Do not install on any public or non secure network.

Remote encrypted Communications
- HTTPS Web browser support (Chrome / Safari / Edge (Chromium))
- HTTPS XML

Communication Ports
- 443 HTTPS (user configurable)
- Wi-Fi Access Point

System Passwords / User access
- All passwords stored in encrypted format
- User authentication required for unit access (no view only mode)
- Passwords comply with min 8 characters (1 capital, 1 special character, 1 numeral)
- User accounts and passwords not stored in system application database
- Password reset via authenticated unit check and issue of temporary code
- Danfoss does not have access nor can view passwords

Software update
- System software (application/device files/OS) stored and distributed via Danfoss software server
- Software payloads have digital signature to ensure authentic source

E-mail alarm notifications
- SSL/TSL 1.2

Wi-Fi User Wireless access point (point to point connection to unit)
- WPA2 encryption
- Default state off, enabled only via authorized users for 120 mins
- Isolated from WAN / Host network
- Password protected SSID associated with unit host #, password

General
- Access to USB application functions (USB flash drive) based on user authentication level/permission
- Factory set Linux OS firewall enabled - all non -required ports closed
- Linux OS updates available via Danfoss secure update server
- FTP - not available nor used in system
- Linux firewall between wireless access point and host network
- Linux firewall between Ethernet 0 and Ethernet 1

Ordering

Table 5: AK-SM 800A variants

Type	Description	Code no.
AK-SM 820A	C-Store (Refrigeration / HVAC / Lighting)	080Z4024
AK-SM 820A - no WiFi	No Wi-Fi, C-Store (Refrigeration / HVAC / Lighting)	080Z4025
AK-SM 850A	Refrigeration (including Lighting)	080Z4021
AK-SM 850A - no WiFi	No Wi-Fi, Refrigeration (including Lighting)	080Z4022
AK-SM 880A	Full (Refrigeration / HVAC / Lighting)	080Z4028
AK-SM 880A - TP78	Retro-fit Full (Refrigeration / HVAC / Lighting)	080Z4029

Table 6: AK-SM 800A variants without LonWorks®

Type	Description	Code no.
AK-SM 820A	C-Store (Refrigeration / HVAC / Lighting)	080Z4044
AK-SM 820A - no WiFi	C-Store (Refrigeration / HVAC / Lighting)	080Z4045
AK-SM 850A	Refrigeration (including Lighting)	080Z4041
AK-SM 850A - no WiFi	Refrigeration (including Lighting)	080Z4042
AK-SM 880A	Full (Refrigeration / HVAC / Lighting)	080Z4048

Certificates, declarations, and approvals

A full list of certificates, declarations and approvals are centrally managed in our Product Store. Individual code number may have some or all approvals, and certain local approvals may not be ready yet.

As some of these documents may change over time, you can always check the latest status at danfoss.com, on our Product Store or by contacting your local Danfoss representative.

ENGINEERING
TOMORROW

Online support

Danfoss offers a wide range of support along with our products, including digital product information, software, mobile apps, and expert guidance. See the possibilities below.

The Danfoss Product Store

The Danfoss Product Store is your one-stop shop for everything product related—no matter where you are in the world or what area of the cooling industry you work in. Get quick access to essential information like product specs, code numbers, technical documentation, certifications, accessories, and more.
Start browsing at store.danfoss.com.

Find technical documentation

Find the technical documentation you need to get your project up and running. Get direct access to our official collection of data sheets, certificates and declarations, manuals and guides, 3D models and drawings, case stories, brochures, and much more.

Start searching now at www.danfoss.com/en/service-and-support/documentation.

Danfoss Learning

Danfoss Learning is a free online learning platform. It features courses and materials specifically designed to help engineers, installers, service technicians, and wholesalers better understand the products, applications, industry topics, and trends that will help you do your job better.

Create your Danfoss Learning account for free at www.danfoss.com/en/service-and-support/learning.

Get local information and support

Local Danfoss websites are the main sources for help and information about our company and products. Find product availability, get the latest regional news, or connect with a nearby expert—all in your own language.

Find your local Danfoss website here: www.danfoss.com/en/choose-region.

Danfoss A/S
Climate Solutions • danfoss.com • +45 7488 2222

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material.
Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product.
All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.