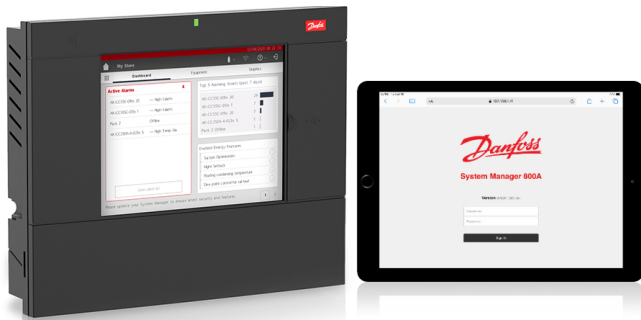*Danfoss*

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 or laptop connection
- 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
- Session Control (Default to Strict Mode)
- Encrypted user accounts / use of strong password supported/recommended

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

<div style="background:red">**Product specification**</div>

Facts

Product highlights
- All new Electronics platform supporting new Operating System (based on Linux)
- Implementation of IT industry standard security protocols (HTTPS, SSL/TLS 1.2, WPA2 encryption)
- Full HTML5 web browser, known as StoreView Browser 5 (SvB5)
- Utilities App (integrated in SvB5)
- Support of Mobile devices (Utilities)
- 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
- Serial Fieldbus support (Lon RS485, TP78, Modbus)
- IP Fieldbus support (AK-IP, SNMP)
- Connections (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	Max. 170 generic device - see Table 4
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) • **Preferred Modbus Meters:** Carlo Gavazzi EM511, EM530 • **Other Modbus Meters:** Wattnode Plus, Veris EH8035, EH8036, Schneider Electric, PM3255 and iEM3250, Carlo Gavazzi EM24AV5, AV6, AV9 • **Other LonWorks Meters:** WattNode	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 Note: Do not mix legacy System Manager 800 units on the same host network as System Manager 800A. These different unit types are not compatible and require separate host networks.
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.

Session Control
System Manager 800A software package v4.0x and above enhances your product's security features to meet internationally recognized regulations such as the NIS2 and CRA Directives. Also following the global standard IEC 62443-4-1 in regard to security by design practices, and to comply to NIS2 and CRA European regulation requirements.

In compliance with IT best practice and mandatory standards, Danfoss is now defaulting to a strong security posture on the System Manager 800A, via software package 4.0.x and above. This feature is called **Session Control** and when combined with HTTPS improves overall security of your product.

Sesson control is an authentication rules engine/module and is intended to improve the overall security posture of your system. Session control offers different configuration settings (Backward compatibility, Permissive and Strict). Depending on how these settings are configured, the remote interface will need to comply accordingly – **installing software release 4.0 and above will <u>default to Strict mode.</u>** Consult with the AK-SM800A user guide for additional details.

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/TLS 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

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Ordering

Table 5: AK-SM 800A variants

Type	Description	Code no.
AK-SM 820A	C-Store (Refrigeration / HVAC / Lighting)	080Z4024
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 850A	Refrigeration (including Lighting)	080Z4041
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.

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