



System manager

**AK-SM 820A / AK-SM 850A /
AK-SM 880A**

SW ver. 5.0x

Global control and supervisory solution for food retail industry

Description

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 & benefits

- Global food retail electronics platform, supporting multiple applications
- Implementation of IT industry standard security protocols
- Enhanced UI/UX – new yet familiar touch screen
- Full built in web server and browser interface, known as StoreView Web (SvW)
- Secure Wi-Fi access point
- Retro-fit ready – includes EoL and legacy control functions supporting smooth upgrade path
- Built-in, license free, energy saving functions

Ordering

Product code numbers

Table: 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: 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

Product details

General data

Table: Features (based on software 5.0 and above)

Main feature	Description
Designed and created for food retail	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> x3 USB port connections Secure Wi-Fi access point for mobile or laptop connection Ethernet (x2) Multiple fieldbus connections and topology (LON, Modbus, Modbus/TCP, SNMP, AK-IP) Northbound (cloud / WAN) Southbound (field bus)
IT Security best practice	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Color touch screen Built in web interface – StoreView Web Quick Links menus help navigate faster through the system Wizards to improve setup work streams
Modern computing platform	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Utilization of standard Web browsers Operational efficiency through the Alsense food retail cloud platform and connected services. Open data access for enterprise systems

Table: 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 AK-CC	Max. 32 generic device support	Max. 170 generic device - see <i>Table: Specifications</i>	Max. 170 generic device - see <i>Table: Specifications</i>
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 includes a History function, allowing the collection, save and view of history points. Sample rate options 1, 2, 5, 10, 15, 30 mins / 1, 2, 6, 24 hr			
<ul style="list-style-type: none"> Polled points: points collected on a scheduled time basis (i.e. every 5 mins). 	3000 polled points	3000 polled points	3000 polled points
<ul style="list-style-type: none"> Event-driven points: only get collected if a change of state is seen (i.e. a setpoint is modified). 	2000 event-driven points	2000 event-driven points	2000 event-driven 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			
<ul style="list-style-type: none"> 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: 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 (Mod#1 / Mod#2)	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 drives: FC103, FC1-2, FC280, FC101	3 per rack/pack	PARITY_EVEN, 38400, DATA_8_BITS PARITY_EVEN, 19200, DATA_8_BITS
Danfoss Modbus/TCP		
Danfoss Alsmart/TCP	170	n/a
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: 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).

Main functionalities

Table: Specifications

Data communication			
Ethernet 0 (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 A for AC-1 (ohmic load), max. 3 A 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	AK-IP, Modbus TCP, SNMP, PI-200		
Hardware specifications			
Enclosure	IP20		
Dimensions (WxDxH)	295 mm (11.6 in) x 65 mm (2.5 in) x 235 mm (9.3 in)		
Weight (gross)	2.408 kg		
Wi-Fi transmitter			
Wi-Fi 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	<ul style="list-style-type: none"> • Modbus (serial) • LonWorks (TP78/RS485) • Danbus (via PI-200) • SNMP • AK-Pack IP controller (UDP/TCP) • Modbus-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.

Session 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 default to strict mode**. 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

- 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

DISCLAIMER: Professional use only

This product is not subject to the UK PSTI regulation, as it is for supply to and use only by professionals with the necessary expertise and qualifications. Any misuse or improper handling may result in unintended consequences. By purchasing or using this product, you acknowledge and accept the professional-use-only nature of its application. Danfoss does not assume any liability for damages, injuries, or adverse consequences ("damage") resulting from the incorrect or improper use of the product and you agree to indemnify Danfoss for any such damage resulting from your incorrect or improper use of the product.

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The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
EAC Declaration	EAC KZ 7100841.13.12.01062	EAC - Eurasian Customs Union	EMC
Electrical Safety Certificate	EAC KZ 7100841.01.01.01245	EAC - Eurasian Customs Union	LVD, EMC
Export Control Declaration	AK-SM 800/800A SYSTEM MANAGERS	Danfoss	
Manufacturer's Declaration	Danfoss MD 080R1221.02	Danfoss	China RoHS
EU-UK Declaration	Danfoss EU-UK 080R1236.01	Danfoss	LVD, EMC, EU RoHS, UK RoHS
Manufacturer's Declaration	Danfoss MD 080R1244.00	Danfoss	EAEU RoHS
EU-UK Declaration	Danfoss EU-UK 080R1231.01	Danfoss	EU RoHS, UK RoHS, RED
Radio Equipment Certificate	MIIT 2021AJ8486	MIIT - Ministry of Industry & Information Technology of China	Wireless
Wireless Certificate	RSM CF 14616 NZ-Rev.00	RSM - Radio Spectrum Management	RCM
UA Declaration	UA 2024-06-27 electr. protection units for compressors	Danfoss	LVD, EMC
UK Declaration	Danfoss UK 080R1236.00	Danfoss	EMC, UK RoHS, RED
UA Declaration	Danfoss UA 8537	Danfoss	UA RoHS
Electrical Safety Certificate	UL E31024	UL - Underwriters Laboratories inc.	
Radio Equipment Certificate	ICASA TA-20210214	ICASA - Independent Communication Authority of South Africa	Wireless
Wireless Certificate	ACMA CF14616 AU-Rev.00	ACMA - Australian Communication and Media Authority	RCM
Radio Equipment Certificate	MIIT 2021-8491	MIIT - Ministry of Industry & Information Technology of China	Wireless

The AK-SM 800A (software version 4.3 and above) complies with various cyber security standards and regulations.

The Radio Equipment Directive (RED) 2014/53/EU sets essential requirements for radio equipment marketed in the EU, ensuring safety, electromagnetic compatibility, and efficient use of the radio spectrum. Recent updates to the Directive, specifically under Delegated Regulation (EU) 2022/30, introduce new cybersecurity and privacy requirements, effective from August 1, 2025.

These new provisions mandate that radio equipment with internet connectivity or the ability to process personal data must incorporate safeguards to:

- Protect against network and service misuse
- Prevent unauthorized access and data breaches

Manufacturers must now integrate cybersecurity-by-design principles, conduct conformity assessments, and update technical documentation to demonstrate compliance. Products affected include smartphones, wearables, connected toys, and IoT devices.

As part of our commitment to security and regulatory alignment, our product development processes are certified under IEC 62443-4-1, the international standard for secure product development lifecycle. This certification validates our systematic approach to identifying, managing, and mitigating cybersecurity risks throughout the product lifecycle and supports compliance with RED's enhanced security requirements.

This proactive approach ensures that our products not only comply with EU regulations but also adhere to globally recognized cybersecurity best practices, strengthening trust and reliability in connected technologies.



CISA (Cybersecurity and Infrastructure Security Agency)

NIS2 Directive (Directive (EU) 2022/2555)

Contact details

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



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