



AK-SC255 On-Site Installation Guide

How to Use This Guide

Read this Guide completely as you install and start up your new AK-SC 255 controller.

Scope of document

The intended scope of the 'On-Site Installation Guide' is to provide guidance on how to mount, power and apply initial system settings. The goal of this guide is to ready the AK-SC255 for the commissioning phase, where more detailed documentation is available.

Further recommended reading

The following documentation is designed to provide further reading for commissioning and system setup, and is available via the following Danfoss web sites:

<http://www.danfoss.us/foodretail>

<http://www.danfoss.com/foodretail>

AK-SC255 REFERENCE MANUAL (RS.8D.M1.22)

AK-SC255 'R' SUPPLEMENT MANUAL (DKRCE.ES.R1)

AK-SC255 'E' SUPPLEMENT MANUAL (DKRCE.EC.R1)

What's Needed for Installation

What you will need to finish the installation:

1. A screwdriver
2. A drill and fasteners appropriate to mounting the controller.
3. A dedicated 120V a.c. or 230V a.c. circuit (the unit is fused internally at 1.0 Amp)
4. OEM installations require a dedicated disconnect

Wire and Cable Requirements

AK-SC255 Power:	~100 to 240V a.c. 50/60Hz (Use approved local wiring codes of practice)
AK-SC255D (DIN)	5 V d.c.
Communications:	
Ethernet	Approved Cat5 cable
Host	18-22AWG, Beldon or equivalent (or approved Cat5 if Ethernet is used as Host)
I/O network	18-22AWG, Beldon or equivalent (Twisted pair stranded wire with shield)

A Note about Code Compliance

Danfoss believes that no instruction in this guide violates any national or local electrical code, but the installer is responsible for compliance with any code applicable to the installation site. Use the installation drawing as reference.



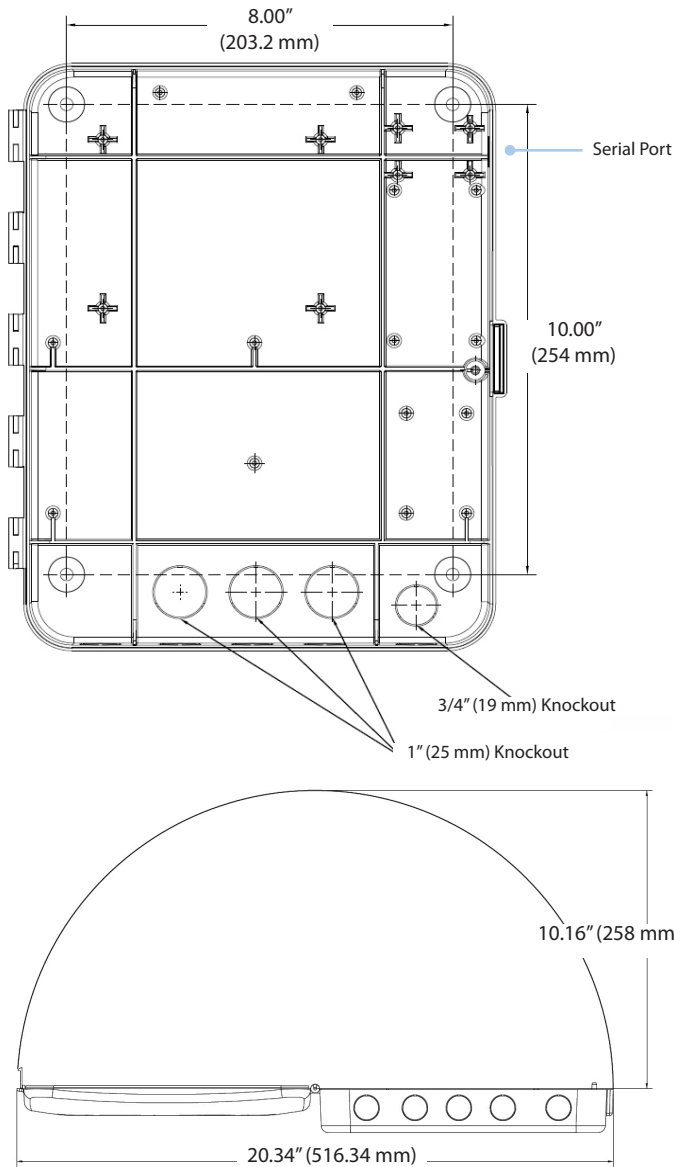
WARNING: To avoid risk of injury from electric shock, ensure correct electrical isolation is made before working within the enclosure.

WARNING - The AK-SC255 contains a 3 V battery (type CR2032) to maintain programmed settings. Do not recharge, disassemble or dispose of in fire. Danger of burn or explosion may occur if mistreated, follow local regulations for correct disposal. Replacement battery is available from typical battery stockists.

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Mounting screw locations, general dimensions



Mounting and Wiring

Mounting (AK-SC255 screen version)

The mounting location should be flat, dry and free from major vibrations. The AK-SC255 should be mounted at eye level, with consideration for the following approximate outline dimensions:

- Unit Width 10.5" (266 mm)
- Unit Height 12.5" (317 mm)
- Unit Depth 2.5" (63 mm)

Mounting holes 8.0" (203.2 mm) Width
 Mounting holes 10.00" (254 mm) Height

To allow the door to fully open, ensure that there is an area at least 21" (533 mm) x 11" (280 mm) free, leaving room for conduit connections beneath the controller. Mount the controller using appropriate screws through the holes indicated at left, fastening the back of the controller enclosure securely to the flat surface chosen.

Allow approx 3" (76 mm) for side access to local connection port (Danfoss cable part # 080Z0262)

Internal component layout

With the controller door open, the two main sections of the AK-SC255 can be seen, Base board & Connector board.

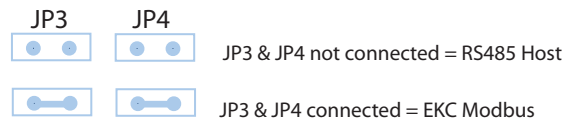
Base board

Mounted on the door frame is the 'Base board' with the main CPU card. The base board contains the following important components that need to be set for correct system operation:
 Battery (shipped in disabled position)

Type CR2032 with (+) side facing toward the user.
 Engage battery circuit to ensure data is protected after power loss - set Jumper JP5 as follows. JP5

Host RS485 / Modbus Network

The AK-SC255 system utilizes a selectable RS485 / Modbus port (located on Connector board). The unit comes factory set as Modbus communications. To enable RS485 Host network, Jumpers JP3 & JP4 need to be set. Note that if Modbus is used, RS485 host is not available - set host to Ethernet in AK-SC255 software.



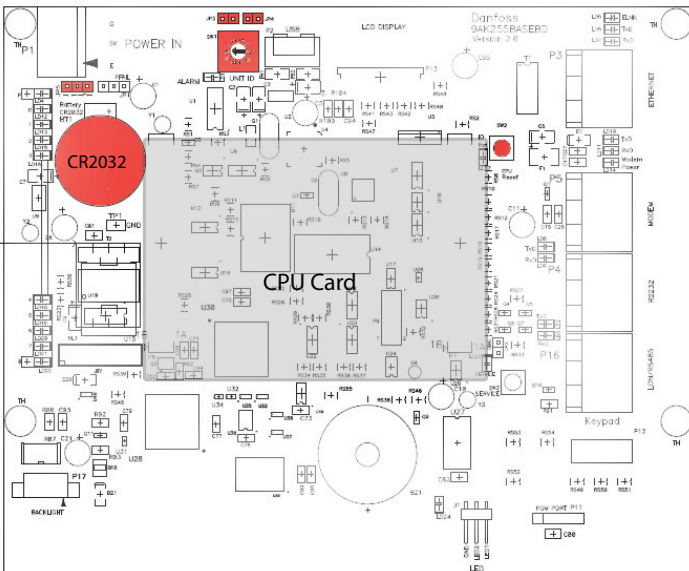
System address switch

Rotary address switch to set AK-SC255 address
 Address 0 = Master (1-9 for Slave units)

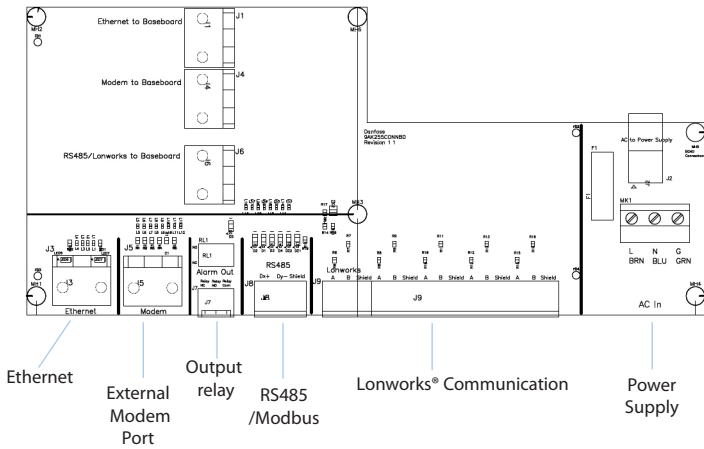
System Reset

Use the CPU reset button to reset the AK-SC255

Internal Component layout (Base board)



Connector Board - User Connections



Internal component layout cont.

Connector board

The Connector board contains the main user connection ports needed for communications, relay output and power supply:

Ethernet

Standard RJ45 Ethernet port, used for TCP/IP remote connection (LAN,WAN), SNMP network support & Host network. Use Ethernet as Host network if 'Virtual Display' functionality is required.

RS485 Host network / Modbus

Use the RS485 port either for RS485 Host or EKC Modbus communications. For **RS485 Host** communications, use 2 conductor shield cable. Up to 10 AK-SC 255 controllers can be connected in a host network.

Host / Modbus network options	JP3 & JP4	Notes
RS485 Host	OFF	Used when combining AKC55 / 255 on host 120 Ohm terminator to be on 1st & last unit
EKC Modbus	ON (factory set)	Use for EKC Modbus controllers 120 Ohm terminator to be on last controller only If host network required use Ethernet
Ethernet Host	N/A	Use Ethernet port and connect to LAN Configure in 'Communications' section

External Modem

Modem port used in conjunction with Modem Adapter kit 080Z2100

Relay

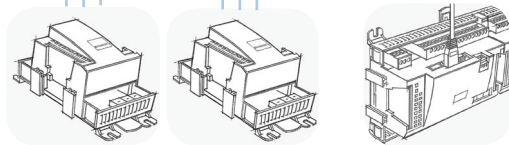
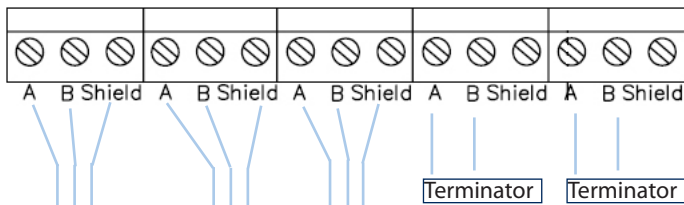
Rated at 30V d.c. 1Amp. Used for external alarm signal.

Lonworks® I/O Network

The I/O (Input-Output) network uses Echelon® Lon Talk® communications. Depending on AK-SC255 version, up to five I/O network cables can be connected to each AK-SC 255. When connecting "A" and "B" conductors, there is no polarity to observe for AK I/O modules. For more information about connecting I/O cables, and restrictions on their length and layout, consult the AK-SC255 Reference Manual. Attach a terminator to each set of unused I/O terminals.

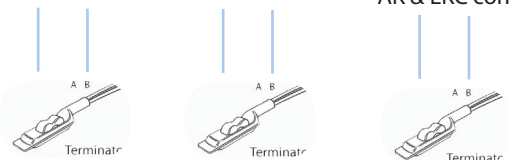
For Generic networks (EKC & AK controllers) it is recommended only to use one of the five ports available. Follow network wiring regulations for each of the different network types. For additional information on networks consult Danfoss document entitled 'Data communication between ADAP-KOOL® Refrigeration Controls' (RC8AC302)

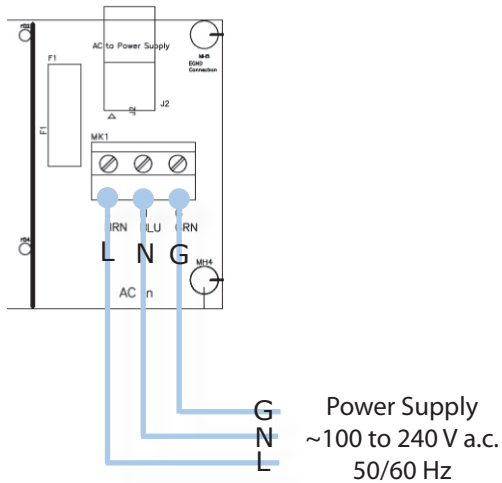
Lonworks® I/O Network (TP78, RS485, FTT10 options available)
Depending on protocol type, the number of network ports will differ



AK-I/O Modules.. AK-I/O Modules

Generic Controller devices
AK & EKC controllers





Making connections to the controller

Conduit entrances are located both on the bottom of the controller and at the back. Five, 7/8" (22 mm) conduit access ports are available at the bottom. Located at the rear, there are three 1 1/8" (28 mm) ports with an additional 7/8" (22 mm) port.

Make sure any I/O network and communication runs are kept separate from the mains power.

Power connection

The AK-SC255 has an auto sensing power supply and is intended for voltage ranges 100 - 240 V a.c. 50/60 Hz. An onboard fuse rated at 1 Amp protects the internal electronics. Ensure the same type / rating fuse is used if required.

The **AK-SC255D** (DIN) mount should be powered with a 5 V d.c. supply.

Local connection

A local connection to a PC can be established using either Ethernet or via the RS232 direct connect port (located at the right hand side of the AK-SC 255 or the RS232 port on the DIN AK-SC255 model). For local connection via RS232 use Danfoss cable part # 080Z0262.

External connection by dial-up modem

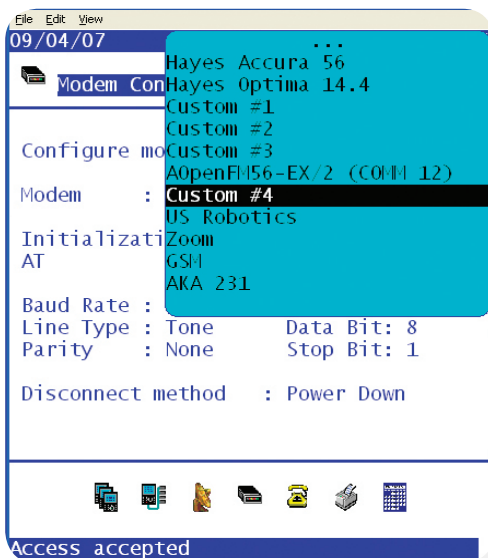
When using a modem to connect / dial out alarms, it is recommended that the modem adapter kit (080Z2100) is used.

From the Main Menu select 'Communications'. Goto '**Modem Config**'. Answer the system question 'yes' to 'Configure modem on this unit:' Next, use the drop down list (see screen shot opposite) to select your modem type.

Ensure all other parameters are set (Baud rate, line type, Data & stop bit and parity). Typically these values can be left as 'factory standard'.

The final setting, 'Disconnect method' refers to the way the modem is disconnected after use. Use the 'Power down' option if a modem adapter is being used. This will toggle the adapter and ensure a clean power re-set.

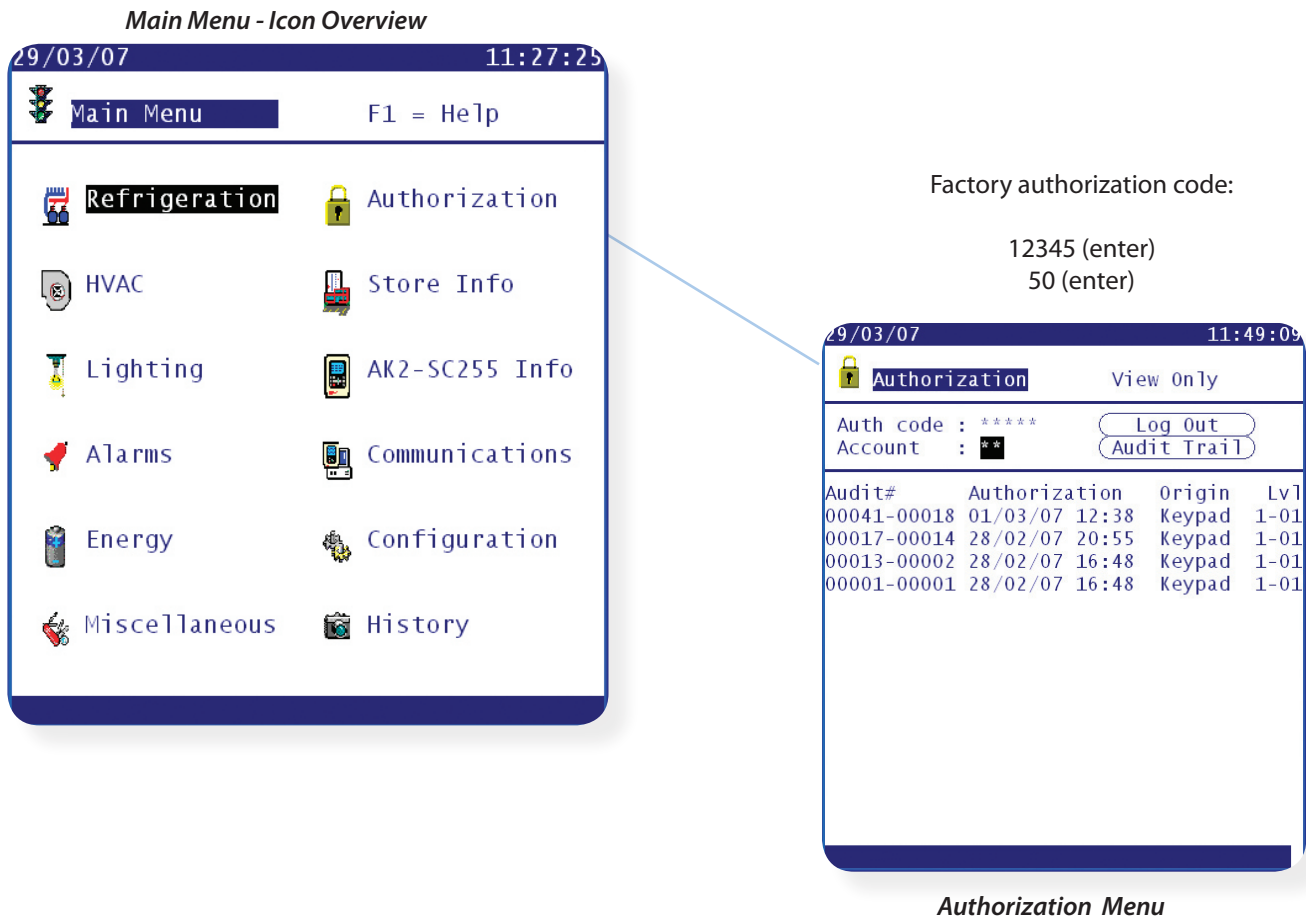
Direct connect (side port) using Danfoss cable 080Z0262



Modem Config page (choose modem type)

Initial AK-SC255 configuration

To get the AK-SC255 ready for full commissioning, a few steps should be implemented. The following section covers the typical settings required for commissioning preparation.



Authorization

After a successful boot up the AK-SC 255 will display the 'Main Menu'. Move the cursor, using the arrow keys, to the menu item "Authorization" and press the ENTER KEY.

On the Authorization screen, the cursor is on a field called "Auth." Below that is a field called "Account." Your first operation, each time you use the controller, will be to enter your authorization code and account number. These will be given to you by the system owner. **The default authorization code from the Danfoss factory is 12345, and the default account code is 50.** Once the correct supervisor code has been entered the screen will change and reflect 'supervisor' (assuming the factory code is valid and has not been replaced).

Store Info

The 'Store Info' icon contains various settings that reflect language, preferences, opening hours and other configuration parameters. See the following page for an overview of the main areas - configure as required.

Opening Hours
Used in conjunction with relative lighting Schedules (00:00 - 00:00 = always on)

	Open	Close
Monday	07:00	00:00
Tuesday	07:00	00:00
Wednesday	07:00	00:00
Thursday	07:00	00:00
Friday	00:00	00:00
Saturday	07:00	00:00
Sunday	07:00	00:00

Store Name: provide name
Store Clock / Time
Sync clocks at midnight: Set to 'yes' if master AK-SC255 is to send time to slave AK-SC255 units (on host network)
Time Zone: Used to correctly 'time stamp' e-mail alarms

09/01/07 20:57:35

Store Info

Store Name : ██████████
Store Clock : 09/01/07 20:57
Synchronize clocks at midnight: No
Time Zone: UTC/GMT Offset -500
(e.g. New York = -500 Calif = -800)

Operating Hours Contact Info
Holidays Manager Override
Daylight Savings Units/Languages
Leak Detector Preferences

Unit / Language
Set appropriate units & language

09/01/07 21:01:41

Units/Languages

Pressure : Bar
Temperature : °C
Date : DD/MM/YY
Time : 24 Hour
Light Level : percentage

Language

Holidays
Configure as required (up to 8 holidays)
Used in conjunction with schedules

Daylight Savings
Configure to automatically change AK-SC255 system clock

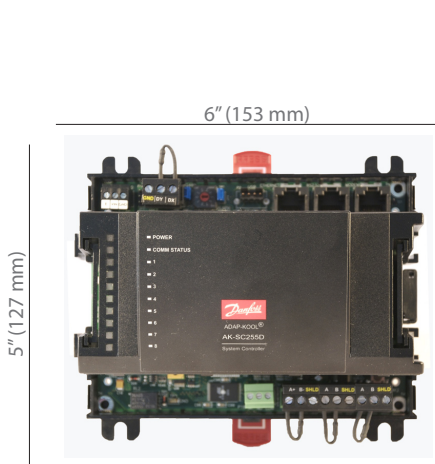
Leak Detector
Configure as required

Contact Info
Configure as required

Manager Override
Configure as required

Preferences
Set as per user requirements

Approvals & Specifications



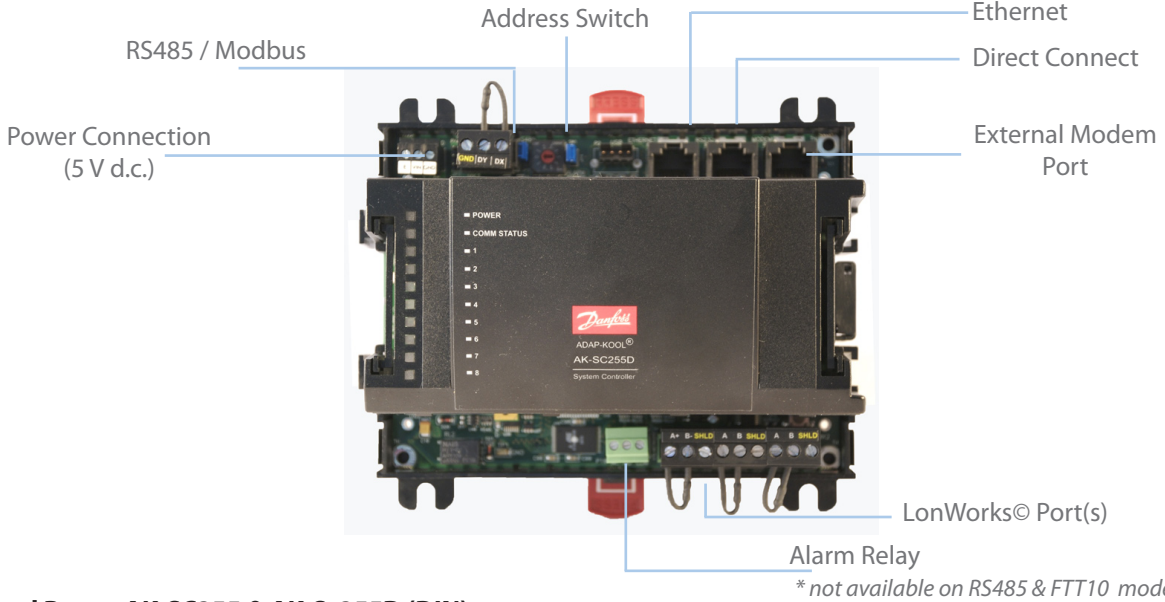
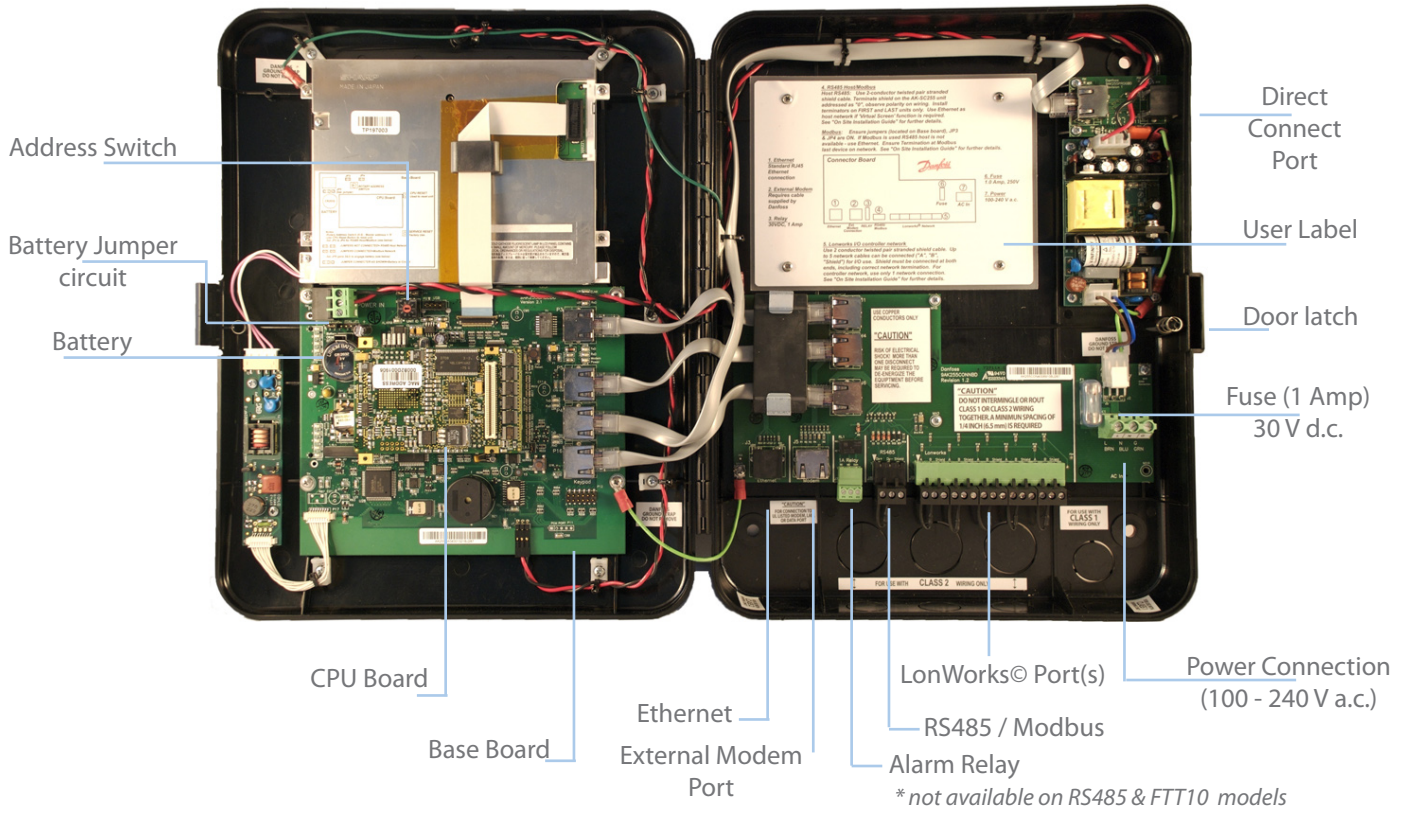
AK-SC255D
DIN Mounted System Manager



AK-SC255
System Manager



Approvals & Specifications



Environmental Range AK-SC255 & AK-Sc255D (DIN)

Operating temperature
 32 to 104°F (0 to +40°C)
 32 to 122°F (0 to +50°C AK-SC255D)
 @ 90% RH (non condensing)

Electrical range
 ~ 100 - 240 V a.c. (+ / - 10%)
 5 V d.c. (AK-SC255D)
 50 - 60 Hz



UL File # E166834

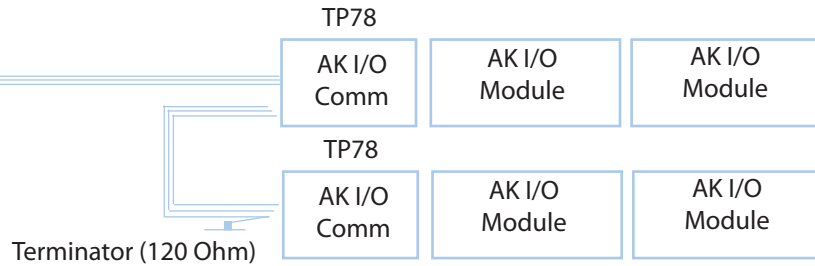
AK-SC255 Available network protocols - Topology Examples



AK-SC255 TP78 version

This example shows the AK-SC255 TP 78 version (screen model). The TP 78 screen version has 5 network ports, whereas the AK-SC255 DIN version has 3 TP 78 network ports. The TP 78 network protocol must be wired in a **'daisy chain'** format and is not polarity sensitive.

AK-SC255 TP78 version
(5 network ports available - screen
3 network ports available - DIN)

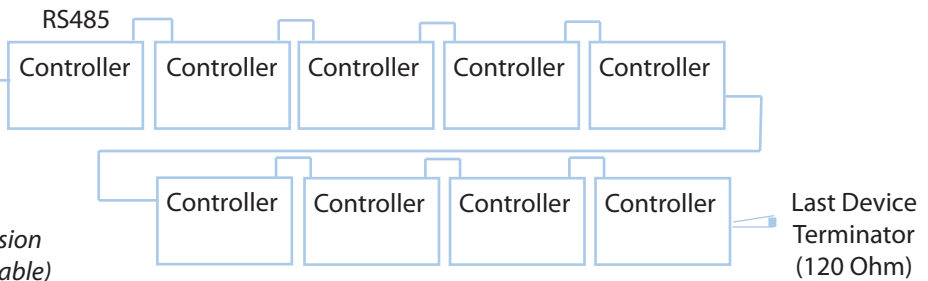


AK-SC255 RS485 version

This example shows the AK-SC255 RS485 version. Both screen and DIN models have a single RS485 communication port. The RS485 network protocol must be wired in a **'daisy chain'** format - recommended that polarity is maintained.

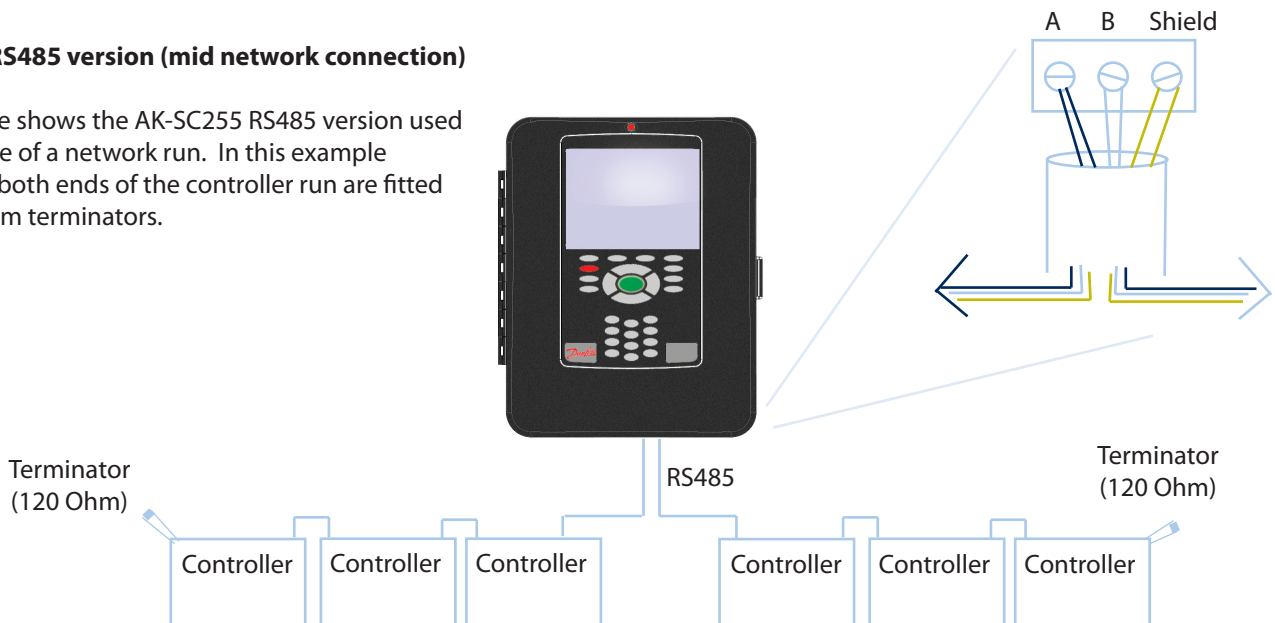
AK-SC255 Terminator (120 Ohm)

AK-SC255 RS485 version
(1 network port available)



AK-SC255 RS485 version (mid network connection)

This example shows the AK-SC255 RS485 version used in the middle of a network run. In this example ensure that both ends of the controller run are fitted with 120 Ohm terminators.

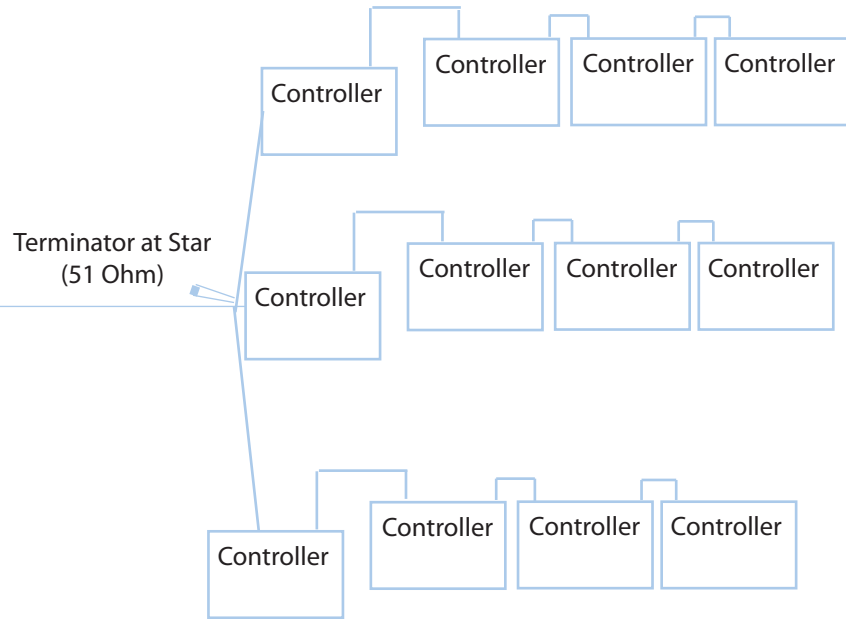


AK-SC255 FTT10 version

This example shows the AK-SC255 FTT10 version. The FTT10 network protocol can be wired in a 'Star' format, with a 51 Ohm resistor located at the 'star' point.



AK-SC255 FTT10 version
(5 network ports available)



Notes:

ADAP-KOOL® Refrigeration Control Systems is a trademark of Danfoss A/S, www.danfoss.com

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