

User Guide

# Danfoss troubleshooting guide for supermarket electronics



## Contents

<b>AK-SM 800</b>	
Keypad not Responsive.....	3
IO Offline .....	3
Database will not load via USB.....	3
Case Controller 'Mismatch' Issue.....	3
AK-SM 800 Stuck on 'Verifying Nodes' .....	3
Missing License .....	4
Host Comm/ Host Count Error.....	4
Slowness in AK-SM 800 .....	4
DNS Failure Alarm .....	4
<b>AK-CC 550A</b>	
AKV Not Opening .....	5
Incorrect Superheat.....	5
Pe Error (E20) .....	5
S3 Error (E25) .....	5
AK-CC 550A Case Controllers Offline .....	5
Mismatch Error during v2.0 Firmware Install .....	6
Configuration (AK-CC 550A to AK-SM 800) .....	6
Dual Temp Setup .....	6
<b>AK-CC 750</b>	
Replacing AK-CC 750.....	6
<b>AK-XM Modules</b>	
AKS Temp Sensor not Reading on IO Module.....	6
AK-XM 103A module not coming online.....	6
Relay will not respond to override through program .....	6
<b>Storeview</b>	
Unable to Connect to Site that Works in Web Browser .....	6
<b>AK-SC 255</b>	
Battery Replacement/Low Battery Alarm .....	7
255 Alarm Dialout Issues .....	7
'Press 9 to Clear Database' Message .....	7
'Alarm' Flashing on 255, LED Red but no active/acknowledged alarms.....	7
IO Offline .....	7
Missing License .....	7
Black Screen .....	7
Host Comm/ Host Count Error.....	7
<b>AKC 55</b>	
AKC 55 IO Relay Chattering .....	8
AKC 55 Loses Program on Power Cycle .....	8
<b>AKC 164</b>	
Sensor Failure Status.....	8
<b>AKA 65</b>	
'Invalid License'.....	8
<b>RC-2000</b>	
SI boards 1,2 Incorrect Readings .....	8
SI board online, not reading temps .....	8
Non-existent Point in Program.....	8
Backlight on, no text .....	8
<b>Smart Alarm</b>	
Not receiving alarms.....	8

**AK-SM 800****Keypad not Responsive**

1. Reset unit
  2. Remove keypad from AK-SM 800 and reconnect
  3. Ensure excessive wiring does not exist behind keypad
    - a. If so, shorten cables where possible
  4. Replace AK-SM 800
- 

**IO Offline**

1. Verify Power to modules, Complete rescan
    - a. Power supply to comm modules should be 24V DC (can be a little higher in AC)
  2. Verify daisy chain comm wiring
  3. Verify 'Channel Lonworks' enabled on Network Nodes screen
    - a. If not, update and rescan afterwards
  4. Verify term resistor switch position at AK-SM 800 is correct
    - a. If 1 loop from plug, switch = 'On' position
    - b. If 2 loops from plug, switch = 'Off' position
  5. Verify EOL resistor in place at end of loop(s)
    - a. 120ohm resistor or term switch in On position
    - b. If term switches exist on modules in middle of loop, need to be in Off position
  6. Verify comm module addresses via rotary switches
  7. Verify that there is no hairline shorts on the comm loop terminal
  8. Verify comm cable type
    - a. EIA RS 485 (max 4000') for LON RS485
    - b. 120 ohms impedance, 42-75.5 pF/m capacitance, typically 22-24 AWG
  9. Isolate loop in sections, rescan
    - a. Identifies where comm problem may be introduced
- 

**Database will not load via USB**

1. Verify filename ends in '.s55' extension
  2. Verify filename is 8 characters or less, no special characters
  3. Verify file is on root drive of USB, not subfolder
  4. Verify controller firmware version equal or higher than database version
    - a. Database version can be verified in RMT
    - b. If database is 255 database being converted, must be v2.191 or higher.
  5. Reset AK-SM 800 and attempt to load again
- 

**Case Controller 'Mismatch' Issue**

1. Go to Network Nodes->Scan Status->Controllers
    - a. Locate address in list
    - b. Note controller version, part #, type shown
  2. Go to Configuration->Control->Refrigeration->Circuits->Type
    - a. Confirm type matches info from #1 above
    - b. If not, change selection in list to proper choice
    - c. Rescan after updating
  3. Common mistakes
    - a. For AK-CC 550A, parameter o61 not set to match program.
      - i. Typically o61=2 for most setups
  4. Recommendations
    - a. Use 'Show only scanned devices' option at top of Circuits screen to limit choices
    - b. If correct choice is missing from list, update system manager to latest version of firmware
- 

**AK-SM 800 Stuck on 'Verifying Nodes'**

1. Go to Network Nodes, verify only channels being used are enabled
  - a. Disable any channels not being used
  - b. Reset AK-SM 800

**Missing License**

1. Did MAC address revert back to 00 : 0B : 2D : 00 : 4B : 00 ?
    - a. If yes, AK-SM 800 must be replaced
    - b. If no, please contact Danfoss Tech Support and supply the MAC address. Tech Support will help reinsert the license.
  2. The controller will still operate regularly, but you won't be able to make any changes to configuration
    - a. In need of immediate assistance, you may load in the back-up/old database to bring the license back.
- 

**Host Comm/ Host Count Error**

1. Verify the comm configuration (config -> comm)
    - a. Make sure to have same master IP addresses for every controller and distinctive slave IP addresses for each slave controllers
    - b. If DHCP is set to no, verify default gateway and network mask. Every controller will share the same default gateway and network mask
    - c. Verify # of SM's on network
  2. Verify rotary dial addresses
    - a. Master unit needs have address 0
    - b. Each controller must have distinctive address
  3. Verify connection from AK-SM 800 to switch, and switch to network
    - a. Could be the issue with the cable
    - b. Power cycle network switch, router, or cell modem
  4. Reset AK-SM 800
    - a. Make sure to reset all slave controllers before resetting master
- 

**Slowness in AK-SM 800**

1. Verify firmware version is above v8.074
    - a. If running an older firmware version, it is recommended to upgrade (latest version is v8.091)
  2. Is slowness present when viewing case controller only or any other screen?
    - a. If only present to case controller info, it could indicate an issue with case controller comm loop
      - i. Try temporarily breaking loop to few case controllers and see if results are better. You may also choose to unplug Modbus plug and see if it speeds up
      - ii. Start adding case controllers back to the loop one-by-one and see at what point slowness returns. This will indicate where the issue is.
- 

**DNS Failure Alarm**

1. DNS stands for domain name server, in which allows you to type domain name (i.e. google.com) instead of server IP. If you know the server IP, you may choose to type in the IP and turn DNS off.
2. DNS failure alarm indicates that an alarm transmitted, or attempted to transmit via email from the AK-SM 800, and there was no feedback from the email server to the AK-SM 800 saying the alarm was received.
  - a. Sometimes the server is simply not setup to send this feedback, so if the user did in fact receive the initial alarm via email, it is nothing more than a nuisance and DNS alarm can be disabled.

**AK-CC 550A****AKV Not Opening**

1. Is proper voltage going into terminal 5 and 6 (should match coil voltage spec)?
2. Is case controller calling for valve to be open? (parameter u23 > 0%)
  - a. If yes, verify voltage on terminals 5 and 6
    - i. If power to 5 but not 6, it could indicate a bad relay
    - ii. If no power to 5, check voltage source
    - iii. If power to both 5 and 6 are okay
      1. Check voltage at AKV coil (possibly a bad solenoid)
      2. Check system for blockage
  - b. If no
    - i. Is superheat reading correct? (see 'incorrect superheat' below to troubleshoot)
      1. If u21 < u22, AKV should be closed if on/ff control, or modulating outside of limits
    - ii. Is saturated suction temp above MOP temp setting (parameter u26 vs. n11)
      1. MOP should be 59 dF for non-CO<sub>2</sub> sites
    - iii. Is main switch on (r12)?
    - iv. Verify 'close EEV during rack shutdown' setting at rack controller is not exceeded
    - v. Verify shutdown schedule in rack controller not enabled

---

**Incorrect Superheat**

1. Is coil outlet sensor (s2) accurate?
  - a. Check parameter u20. If reading inaccurately, the sensor would need to be replaced as inaccuracy could lead to floodback.
2. Is pressure transducer accurate?
  - a. Check parameter o20 (-15psi)
  - b. Check parameter o21 (174psi-HFC, 855psi-CO<sub>2</sub>)

---

**Pe Error (E20)**

1. Verify transducer wiring
  - a. If using 060G1034 connector, terminals 30, 31, 32 wired black, blue, brown.
  - b. Measure voltage across terminals 30, 31. Should be 5 V DC
  - c. Measure voltage across terminals 31, 32. Should be in range of 0.5 – 4.5 V DC.
  - d. Verify transducer type. Label of transducer should say AKS32R (HFC) or AKS 2050 (CO<sub>2</sub>)

---

**S3 Error (E25)**

1. If no return air (s3) sensor exists, verify the following parameters:
  - a. R15 = 100%
  - b. A36 = 100%
  - c. O17 = 100%
  - d. R61 = 100%
2. If return air sensor does exist, verify ohm reading of sensor, and confirm wired to terminals 37, 38.

---

**AK-CC 550A Case Controllers Offline**

1. Complete rescan
2. Verify if loop is Modbus or Lon
  - a. If LON, is comm card installed?
  - b. If Modbus, verify polarity on all units is consistent
3. Verify 'Channel Lonworks' or 'Channel Modbus' enabled appropriately on Network Nodes screen
  - a. If not, update and rescan afterwards
4. Verify term resistor switch position at AK-SM 800 is correct
  - a. If 1 loop from plug, switch = 'On' position
  - b. If 2 loops from plug, switch = 'Off' position
5. Verify EOL resistor in place at end of loop(s)
  - a. 120ohm resistor
6. Verify # of devices on system manager is less than 120.
7. Verify total loop distance less than 4000 ft.
  - a. If longer, repeater must be added.

8. Verify no Duplicates on System Manager
  - a. Found under Duplicates tab in Network Nodes
  - b. If duplicates exist, identify controllers sharing address and correct
9. Verify wire type ok
  - a. Should be EIA485 rated cable
  - b. Refer to Danfoss comm guidelines document as needed
10. Isolate loop in sections, rescan
  - a. Identifies where comm problem may be introduced

---

#### Mismatch Error during v2.0 Firmware Install

1. Refer to AK-CC 550A application guide, "Installing AK-CC 550A with the new v2.0 firmware"
  - a. <https://www.danfoss.com/en-us/service-and-support/fix-and-troubleshooting/supporting-supermarkets/>

---

#### Configuration (AK-CC 550A to AK-SM 800)

1. Refer to AK-CC 550A service guide, "AK-CC 550A to AK-SM 800 Configuration"
  - a. <https://www.danfoss.com/en-us/service-and-support/fix-and-troubleshooting/supporting-supermarkets/>

---

#### Dual Temp Setup

1. Dual temp setup uses the digital input on the case controller (below example uses DI1)
  - a. Set parameter o02 to 7 for thermostat band changeover (European term for dual temp)
  - b. Define your secondary setpoint in parameter r21
  - c. Define high and low alarm settings for that setpoint in parameter A20 and A21

---

#### AK-CC 750

##### Replacing AK-CC 750

1. Set address on the case controller
2. Perform rescan on rack controller
3. Do not upload from case controller
4. Verify the main switch is off
5. Determine how many evaporators are controlled by AK-CC 750
6. Set the Quick Setup in Config. Once Quick Setup is completed, download to AK-CC 750
7. Verify the number of evaporators is correct
8. Turn the main switch on

---

#### AK-XM Modules

##### AKS Temp Sensor not Reading on IO Module

1. Verify input sensor is wired to, verify program matches (including address and sensor type)
2. Ensure board/point is online
3. If reading 320F in program, this indicates open, -50F indicates short.
4. Ohm out sensor at module
  - a. If reading an open, break in cable or loose connection between module and probe
  - b. If reading closed, likely a short in cable between module and probe
  - c. If reading expected resistance (compare to temp-ohm chart for PT1000), move sensor to different input and reprogram address
  - d. Verify other sensors on module reading ok to ensure not a larger problem
    - i. If so, may need to isolate sensors to identify problematic input on module

---

##### AK-XM 103A module not coming online

1. If 255, version must be v2.101 or higher.

---

##### Relay will not respond to override through program

1. Ensure module has power, online.
2. Check Service screen in Rack controller. If 'remote', override is through switch at relay module.

---

#### Storeview

##### Unable to Connect to Site that Works in Web Browser

1. Delete site from Storeview, re-add.

**AK-SC 255****Battery Replacement/Low Battery Alarm**

1. Do not power down controller
  2. Remove old battery
  3. Insert new battery
- 

**255 Alarm Dialout Issues**

1. Verify modem has power
  2. Reset modem, 255
  3. Verify info on Alarm Routing screen
  4. Verify phoneline is active (inbound call from phone)
  5. Verify phone # is correct (outbound call from corded phone on modem phoneline)
  6. Verify modem config screen
- 

**'Press 9 to Clear Database' Message**

1. Database must be cleared, no options to bypass.
  2. Press 9 to clear
  3. Reload database after clear is complete
- 

**'Alarm' Flashing on 255, LED Red but no active/acknowledged alarms**

1. Go to Configuration->Alarms->Service
  2. Clear Alarm Log
- 

**IO Offline**

1. Verify Power to modules, Complete rescan
  2. Verify 'Channel Lonworks' enabled on Network Nodes screen
    - a. If not, update and rescan afterwards
  3. Verify EOL resistor in place at end of loop
    - a. 120ohm resistor or term switch in On position at last comm module
    - b. If term switches exist on modules in middle of loop, need to be in Off position
  4. Verify comm module addresses via rotary switches
  5. Isolate loop in sections, rescan
    - a. Identifies where comm problem may be introduced
- 

**Missing License**

1. Please contact Danfoss Tech Support and supply the MAC address. Tech support will help reinsert the license
  2. The controller will still operate regularly, but you won't be able to make any changes to configuration
    - a. In need of immediate assistance, you may load in the back-up/old database to bring the license back
  3. Verify CPU card is inserted correctly. Reset the controller
- 

**Black Screen**

1. Verify ribbon cable between the screen and CPU board
    - a. If not loose or disconnected, the unit will need to be replaced
- 

**Host Comm/ Host Count Error**

1. Verify the comm and see if the controllers can see each other
  - a. If the router is down, the controllers cannot dial out alarms or see each other
    - i. Power cycle the router and the controllers (Unit #0 as last)
2. Verify host comm type (RS 485 or Ethernet)
  - a. If Ethernet, go to configure internet (comm -> internet)
    - i. Make sure to have same master IP addresses for every controller and distinctive slave IP addresses for each slave controllers
    - ii. Verify DNS and DHCP
    - iii. If DHCP is set to no, verify default gateway and network mask. Every controller will share the same default gateway and network mask
  - b. Verify # of AK-SC255's on network.
    - i. i.e. (of x); x should match the total number of AK-SC 255s in host network
3. Reset #0 (master) to force scan for slave units.

**AKC 55****AKC 55 IO Relay Chattering**

1. Older RO8 modules 'chatter' with AKC 55 v1.061 or higher (incl. 255).
2. Comm timing needs to be changed from 20s to 4s (backdoor change).

**AKC 55 Loses Program on Power Cycle**

1. Battery needs to be replaced (no alarms generate for this). Would need to solder new battery in place of existing.

**AKC 164****Sensor Failure Status**

1. If all sensors reading ok, typically an issue with KVQ valve (replace).
2. Pins 35, 36 inside KVQ actuator should be ~20 kohms @75F.
3. NTC Temp: 120F = KVQ fully open, 220F = NTC fully closed.
4. Valve opens to 100% in this failure mode.

**AKA 65****'Invalid License'**

1. Try right-click on desktop icon, go to Properties->Compatibility tab. Enable check box for 'Run this Program as an administrator'
2. Uninstall software, reinstall AKA65 software outside of Program Files or Program Files x86 folder.
3. Obtain generic copy of aka65.ini file, place in C:/Windows folder (replace existing).

**RC-2000****SI boards 1,2 Incorrect Readings**

1. Is cpu firmware v4.41 or below?
  - a. If so, scan menu is problem. Reset scan menu to defaults and set again.

**SI board online, not reading temps**

1. Reset offset screen

**Non-existent Point in Program**

1. Under debug, go to 'deassign point' and deassign erroneous point
2. Now go to monitoring points, fake a change and exit. (cpu firmware must be v4.5 or higher, login with COD)
3. If cpu firmware is below v4.5, unit must be reprogrammed.

**Backlight on, no text**

1. Verify contrast ok with knob
2. If contrast ok, power supply is bad, replace.

**Smart Alarm****Not receiving alarms**

1. Check 485 polarity
2. Alarms in RC/EC set to local?
3. Repeater may be bad