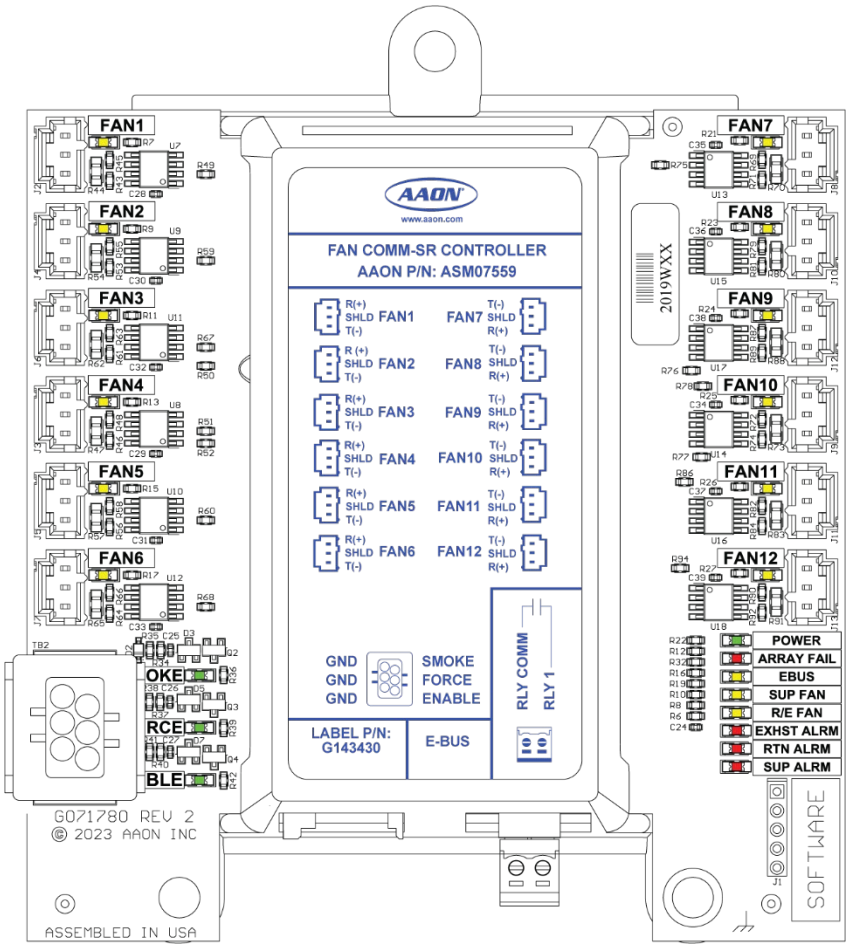
FAN COMM Controller Series Technical Guide

ASM07759SS1189

ASM07804SS1200

ASM07805SS1201



1. PARTS LIST

Table 1: FAN COMM Controller Parts List

Part Description	AAON
FAN COMM Controller S	ASM07804
FAN COMM Controller R	ASM07805
FAN COMM Controller SR	ASM07559
E-Bus Cable 1.5 ft., 3 ft., 10 ft., 25 ft., 50 ft., 75 ft., 100 ft., 150 ft., 250 ft., and 1000 ft. Spool.	G029440 (1.5 ft.), G012870 (3 ft.), G029460 (10 ft.), G045270 (25 ft.), G029510 (50 ft.), G029530 (75 ft.), G029450 (100 ft.), G029470 (150 ft.), V36590 (250 ft.), G018870 (Spool).

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

2. GENERAL

The FAN COMM Controller allows several fan Variable Frequency Drives to be commanded simultaneously from a VCCX-IP and VCCX 454. The FAN COMM Controller can manage any combination of supply, return, or exhaust fans.

The FAN COMM Controller is designed to work with the following drives:

- ABB Models:
  - ACH580
  - ACH180
  - ACS320
- Danfoss Models:
  - FC101
  - FC102
- Unitronics Models:
  - B1 Series
  - B5 Series
  - B7 Series
- Yaskawa Models:
  - GA500
  - V1000
  - Z1000
- Infinium EC Motors

2.1. Features

The FAN COMM Controller (FAC) is designed with 12 Fan VFD connections, three binary inputs, an EBUS connection, and one relay output. The FAN COMM Controller is also equipped with LEDs that showcase the controller's operational status and alarm indications. The EBUS connection for the FAN COMM Controller includes a dual port for easy configuration of two boards.

3. SAFETY

3.1. Important Wiring Considerations

Table 2: FAN COMM Controller Wiring Details

Wiring Details				
Control Device	Voltage	VA Load	Temperature	Humidity (Non-Condensing)
FAN COMM Controllers (R, S, SR)	18-30 VAC	15	-22°F to 158°F	0-95% RH

3.2. General Information

Correct wiring of the FAN COMM Controller is the most important factor in the overall success of the controller installation process. Most FAN COMM Controllers are installed, and wired, at the AAON factory. It is also possible to purchase these controllers through a local AAON representative for installation in the field. Some of the following information pertains to field wiring and may not apply to the installation if it was pre-wired at the factory. However, if troubleshooting of the controller is required, it is a good idea to be familiar with the system wiring, whether it was factory or field wired.

3.3. Controller Mounting

When the controller is to be field-mounted, it is important to mount the controller in a location that is free from extreme high or low temperatures, moisture, dust, and dirt. See Table 2, this page, for a list of the required operating conditions for the FAN COMM Controller and associated expansion modules.

The FAN COMM Controller is housed in a plastic enclosure. It is designed to be mounted by using the three mounting holes in the enclosure base.

The FAN COMM Controller needs to be installed in an environment that can maintain a temperature range between -22°F and 158°F to not exceed 95% relative humidity levels (non-condensing). Be careful not to damage the electronic components when mounting the controller.

3.4. Wiring

The FAN COMM Controller is powered via E-BUS, so no additional power connections are required.

Three equipment part numbers are generated for the FAN COMM controller, along with three different versions of the software, one for supply fans, one for return and/or exhaust fans, and one for all three fans. Prior to installation, ensure that the correct part number has been selected to meet operational requirements. The FAN COMM controller is supplied with its corresponding software pre-installed.

3.5. Powering Up

When the FAN COMM Controller and connected modules are first powered up, the POWER LED should light up and stay on continuously. If it does not light up, verify that power is connected to the controller and that the wiring connections are tight. If after making all these checks, the POWER LED does not light up, please contact AAON Controls Support for assistance.

4. INSTALLATION

4.1. 12 or Less Fans are connected

Use the FAN COMM-SR to support all configurations of supply, return, and exhaust fans when there are 12 or less fans present.

4.2. 13 to 24 Fans Connected

Up to two FAN COMM boards can be used when the total number of fans exceeds 12. However, each fan selection (supply and a combination of return or exhaust) cannot exceed 12 fans. Additionally, a fan selection **cannot be** split across two FAN COMM boards, i.e., configuring the supply fans on two different boards. The only allowed board combination for a two-board configuration is an S and an R controller.

Most of the drive parameters that are needed for operation of the FAN COMM Controller are set by the FAN COMM Controller; all other drive parameters are set by the factory or by field technicians. For example, the maximum value for each drive is the controller's 100% output, which can be reduced by the airflow values provided in Prism. To modify the airflow values, verify the airflow of the FAN COMM Controller and set it to the range in which the fans will operate.

For example, if the maximum frequency of the drive is set to 60 Hz and the minimum (40%) and maximum (80%) air flow are set for the air balance values, the FAN COMM Controller will set the main controllers to 40-80% of the drive's range (21-48Hz).

If a two-board configuration is needed, an additional E-BUS cable will be required to connect the two boards.

5. FAN COMM CONTROLLER

5.1. FAN COMM Controller Dimensions

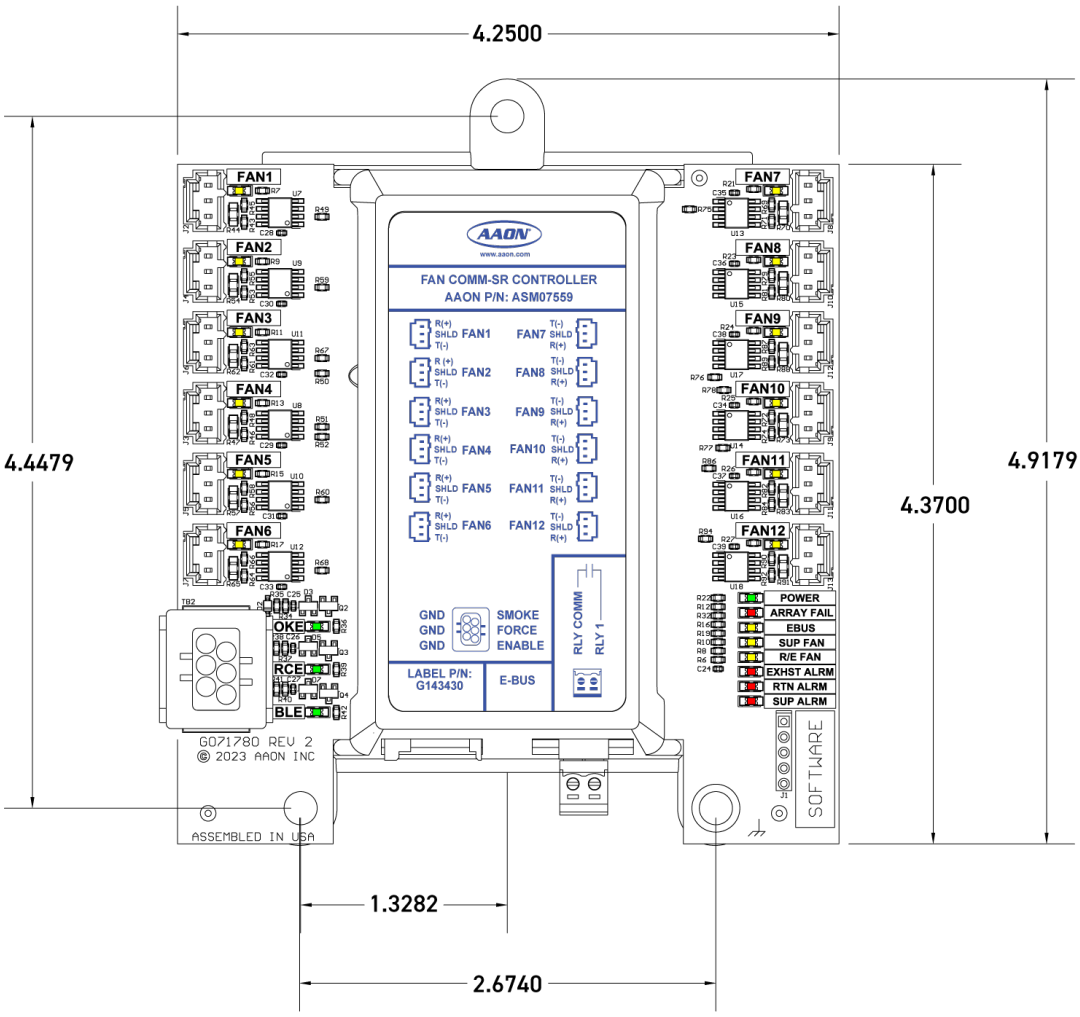


Figure 1: FAN COMM Controller Dimensions

Note: All dimensions are in inches and apply to all FAN COMM Controllers.

5.2. FAN COMM Controller Configurations

5.2.1. FAN COMM Controller R (Return and Exhaust Fans)

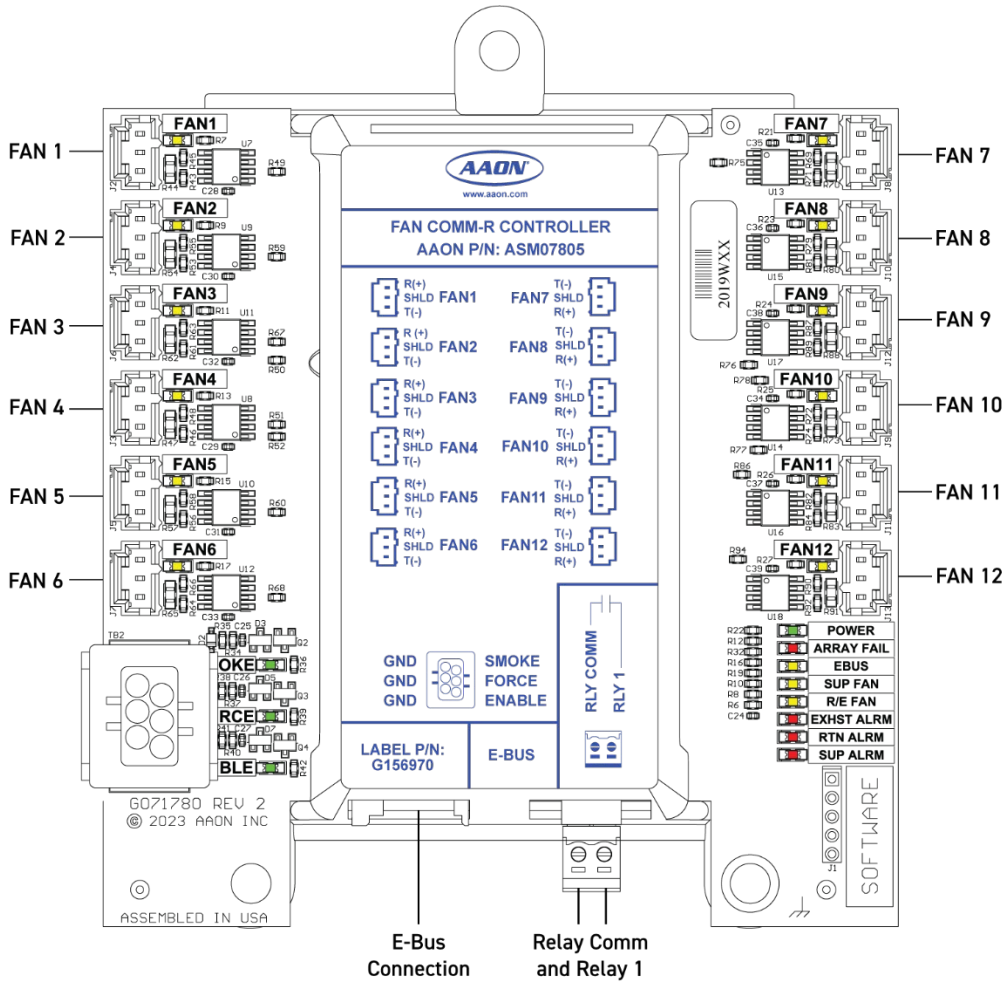


Figure 2: FAN COMM Controller (R)

5.2.2. FAN COMM Controller S (Supply Fans)

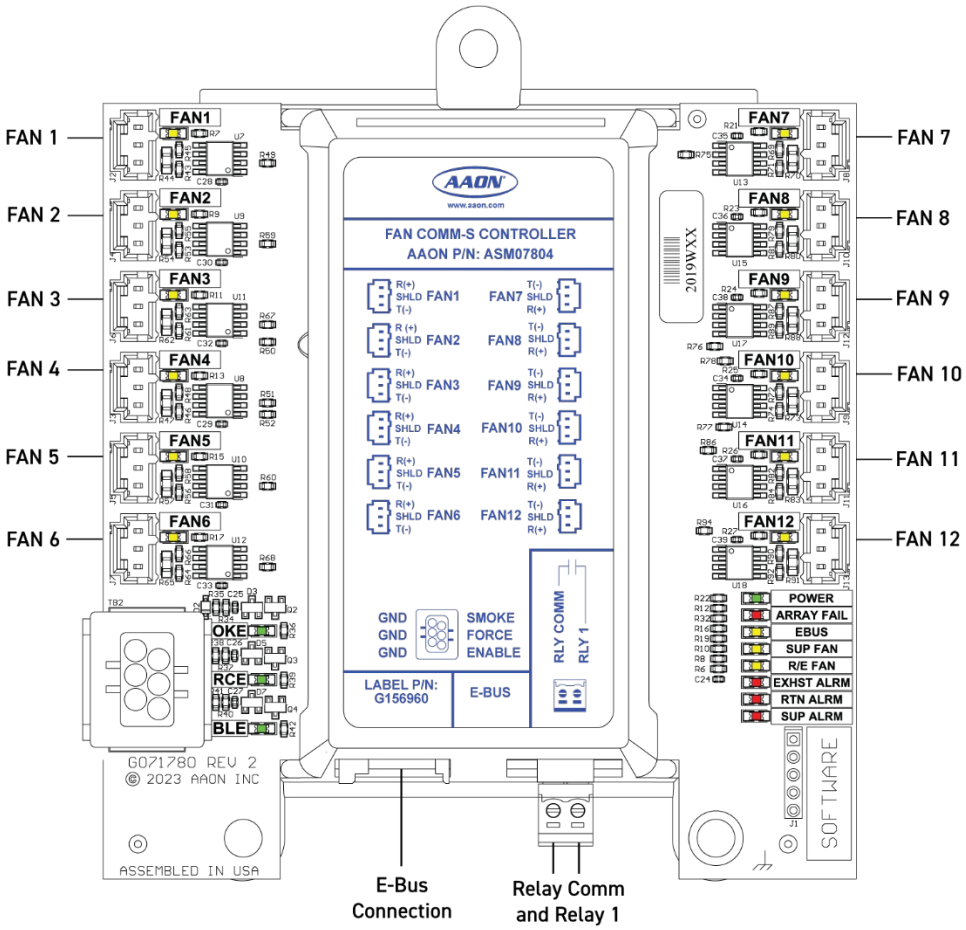


Figure 3: FAN COMM Controller (S)

5.2.3. FAN COMM Controller SR (Supply, Return, and Exhaust Fans)

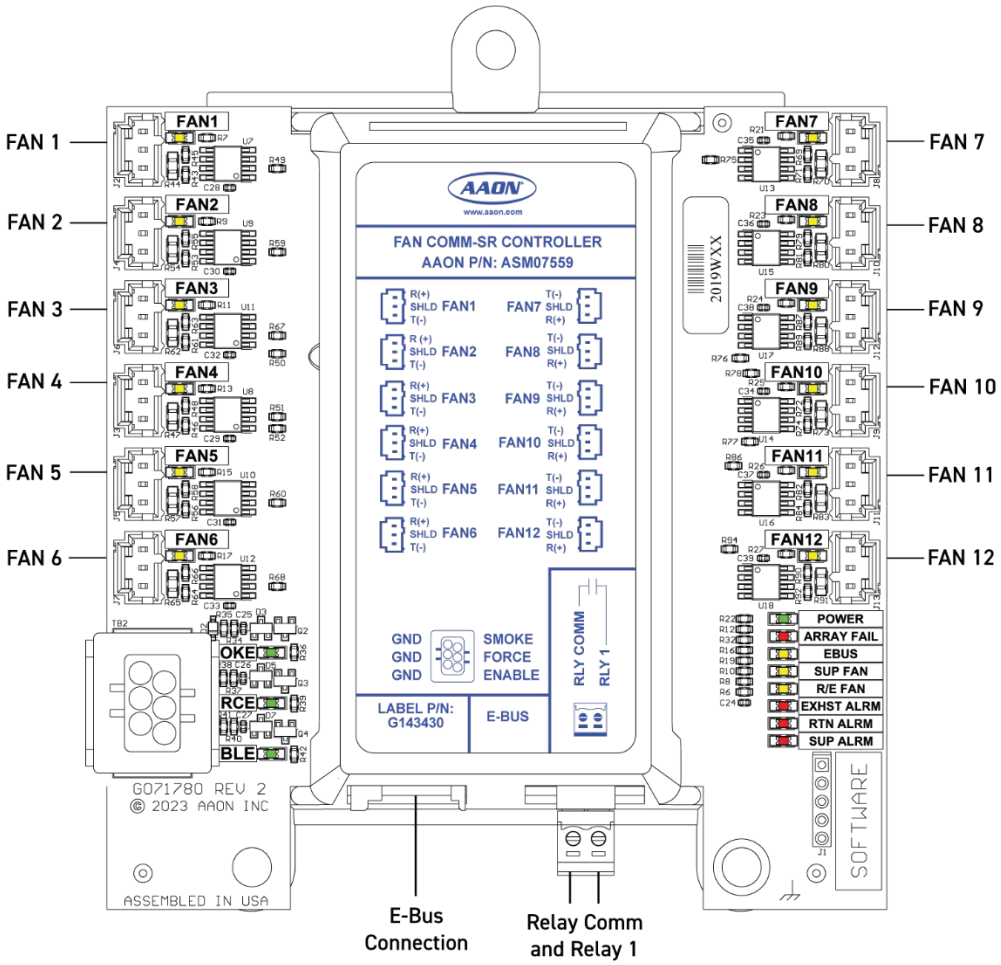
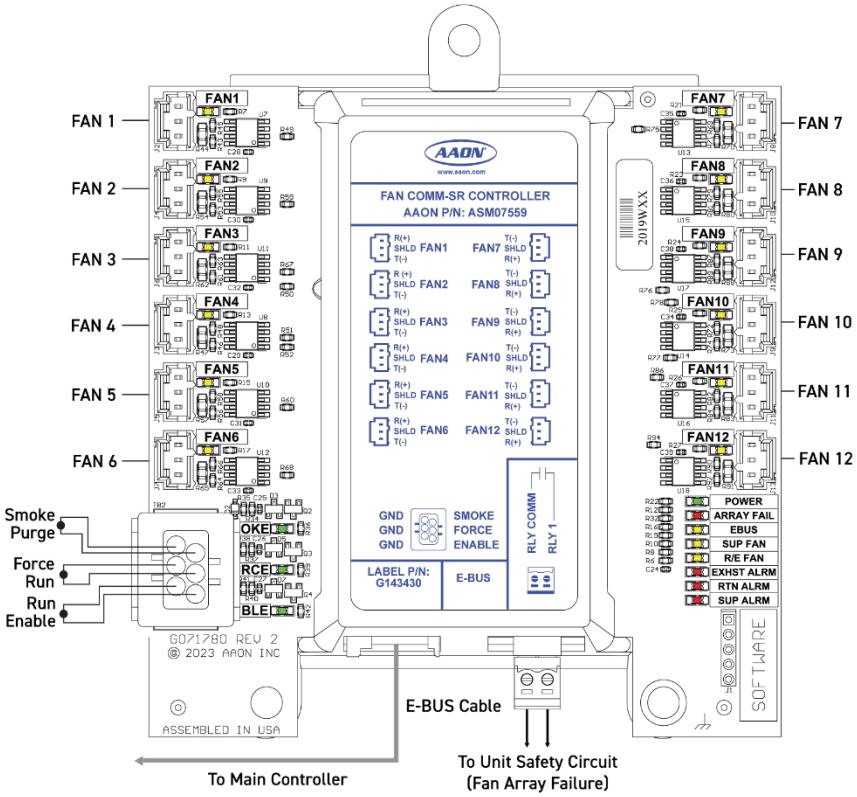


Figure 4: FAN COMM Controller (SR)

Note: The SR Board can support any combination of exhaust, return, and supply fans, so long as the total number of fans does not exceed 12. The fans must be arranged in the following order: supply fans, then return fans, and finally exhaust fans.

6. WIRING

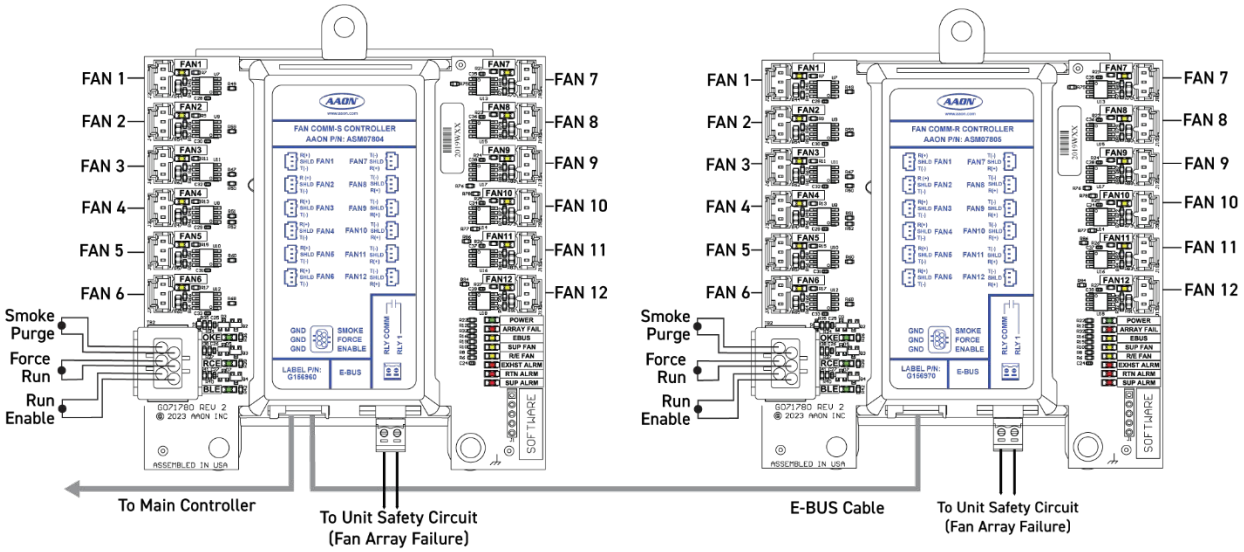
6.1. Single-Board Configuration



NOTE:
1. The wiring is the same for all FAN COMM Boards.
2. The Run Enable input must have voltage present to operate normally.
3. The Smoke Purge input has priority over the Force Run and Run Enable inputs.
4. If the Smoke Purge or Force Run input is activated, the fans will run as required regardless of the Run Enable's state.
5. The Force Run input has priority over the Run Enable input.
6. The relay for the FAN COMM Controller is energized during normal operation and de-energized during a Fan Array Failure.

Note: An SR board is the default controller for single-board configurations when fewer than 12 fans are in operation.

6.2. Two-Board Configuration



NOTE:
1. The wiring is the same for all FAN COMM Boards.
2. See the unit's wiring diagram for more information.
3. The Run Enable input must have voltage present to operate normally.
4. The Smoke Purge input has priority over the Force Run and Run Enable inputs.
5. If the Smoke Purge or Force Run input is activated, the fans will run as required regardless of the Run Enable's state.
6. The Force Run input has priority over the Run Enable input.

Note: If the total number of fans exceeds 12, keep all of the supply fans on the S board and all of the return or exhaust fans on the R board. Configure the R board with the return fans listed first, followed by the exhaust fans.

7. DRIVE PARAMETERS

A list of parameters that must be set for the ABB, Danfoss, Unitronics, and Yaskawa drives to communicate properly is featured in the tables below. Each table specifies the drive's parameter numbers and their required values.

Table 3: ABB ACH580 / ACS180 Operational Parameters

ABB ACH580 / ACS180			
Parameter #	**Description**	**Default**	**Required**
30.12	Max Speed	1500.00rpm	Identical to parameter 46.01 when running in speed control mode. (Param. 19.01 = Speed)[2]
30.14	Max Frequency	60.00 Hz	Identical to parameter 46.02 when running in scalar (Hz) control mode. (Param. 19.01 = Scalar (Hz))[2]
46.01	Speed Scaling	1500.00rpm	Identical to Parameter 30.14. This value is the largest value the FAC can command when in speed control mode. (Param. 19.01 = Speed)[2]
46.02	Frequency Scaling	50.00 Hz	Identical to Parameter 30.14. This value is the largest value the FAC can command when in scalar (Hz) control mode. (Param. 19.01 = Scalar (Hz))[2]
58.01	Protocol Enable	None	Modbus RTU[1]

Note: [2] These parameters can only be modified when their corresponding drive mode (scalar or speed) is not running.

[1] Ensure that the following parameter is set, as it impacts the Fan COMM Controller's ability to communicate with the VCCX.

Table 4: ABB ACS320 Operational Parameters

ABB ACS320			
Parameter #	**Description**	**Default**	**Required**
1104	REF1 MIN	0.0 Hz	ABSOLUTE MIN (See Installation Section)
1105	REF1 MAX	60.0 Hz	ABSOLUTE MAX (See Installation Section)
2007	MINUMUM FREQ	0.0 Hz	ABSOLUTE MIN (See Installation Section)
2008	MAXIMUM FREQ	60.0 Hz	ABSOLUTE MAX (See Installation Section)
5302	EFB STATION ID	1	1 **(Default)**
5303	EFB BAUD RATE	9.6 kbits/s	9.6kbits/s **(Default)**
5304	EFB PARITY	8 NONE 1	8 NONE 1 **(Default)**
9802	COMM PROT SEL	1 (STD MODBUS)	1 (STD MODBUS) **(Default)**

Note: **Default**: The required value for operation, which should not be modified.

Table 5: Danfoss Drives (FC101 and FC102) Operational Parameters

Danfoss Drives (FC101 and FC102)			
Parameter #	**Description**	**Default**	**Required**
3-03	Maximum Reference	60 Hz	This value will correspond to 100% from the FAC, unless limited by 4-14 or 4-19.
4-14	Motor Speed High Limit [Hz]	Size related	Identical to Parameter P3-03.
4-19	Max Output Frequency	Size related	Identical to Parameter P3-03.
8-30	Protocol	0 (FC)	2 (Modbus RTU)[1]

Note: [1] Ensure that the following parameter is set, as it impacts the Fan COMM Controller's ability to communicate with the VCCX.

Table 6: Unitronics Drives (B1, B5, and B7 Series) Operational Parameters

Unitronics Drives (B1, B5, and B7 Series)			
Parameter #	**Description**	**Default**	**Required**
P00.03	Max output frequency	50.00Hz	Identical to Parameter P00.04.
P00.04	Upper limit of running frequency	50.00Hz	Identical to Parameter P00.03.
P14.00	Local Communication Address	1	1 **(Default)**
P14.01	Communication baud rate setup	4 (19200BPS)	4 (19200BPS) **(Default)**
P14.02	Data Bit Check setup	1 (Even Parity, 8 data bits, 1 stop bit)	1 (Even Parity, 8 data bits, 1 stop bit) **(Default)**

Note: **Default**: The required value for operation, which should not be modified.

Table 7: Yaskawa Drives (GA500, V1000, Z1000) Operational Parameters

Yaskawa Drives (GA500, V1000, and Z1000)			
Parameter #	**Description**	**Default**	**Required**
E1-04 (0x303)	Max Output Frequency	60.0 Hz	The FAC's 100% output
H5-01 (0x425)	Serial Comm Adr	1F hex (31 dec)	1F hex (31 dec) **(Default)**
H5-02 (0x426)	Serial Baud Rate	3 (9600 bps)	3 (9600 bps) **(Default)**
H5-03 (0x427)	Comm Parity Selection	0 (No parity)	0 (No parity) **(Default)**
H5-08 (0x62D)	Comm Protocol Select	0 (Modbus)	0 (Modbus) **(Default)**

Note: **Default**: The required value for operation, which should not be modified.

8. OPERATION

The fans should be arranged so the supply fans are the lowest numbered fans, followed by the return fans, and lastly the exhaust fans. For example, if there are six supply fans, two return fans, and two exhaust fans, fans 1-6 will be designated as supply fans, fans 7 and 8 will be designated as return fans, and fans 9 and 10 will be designated as exhaust fans within the FAN COMM Controller.

The FAN COMM Controller has two selectable redundancy methods available: a SBF (Standby Fan) or Overspeed Redundancy, which can be configured in Prism via the Setpoints' Miscellaneous page. See *Figure 5 for more information.*

Each fan selection (supply, return, or exhaust) may be configured independently for any redundancy method and will be able to operate independently.

There is an option to use both redundancies, with the SBF occurring first, followed by overspeed. If no redundancy is set, and there are no backdraft dampers, any fan failure will cause the fan array to fail and result in the de-energization of the relay.

8.1. Standby Fans

The SBF mode leaves the selected number of fans with the most run time turned off; this time is recalculated every 24 hours while the FAN COMM series controller is operating. The fan(s) that are left off act as redundant fans and will run to replace failed fans.

8.2. Overspeed Redundancy

The overspeed redundancy operates the remaining fans at a higher speed to compensate for the failed fans via individual commands. This only occurs within the full speed capabilities of the running fans.

8.3. Failed Fan Limits

In the event of a failed fan, an alarm output will be generated and given to the VCCX. If there is a redundancy set, the redundancy will kick in until the maximum amount of allowed failures is exceeded, before triggering a fan array failure.

If the SBF or both redundancies are used, the Failed Fan Limit is configured to be equal to, or to exceed, the number of configured SBF fans. However, depending on other factors (such as redundancy type or backdraft dampers), the board will calculate a maximum number of failures and will limit the maximum number of failures given. Users can configure the number of fans allowed to fail in Prism; however, if the value selected exceeds the FAN COMM Controller's calculated maximum, the controller will override the chosen value.

If no redundancy is set, and there are no backdraft dampers, the maximum allowed fan failures is zero. If no redundancy is set, but the selection includes backdraft dampers, the maximum allowed failures is the number of fans divided by three and truncated, so if 10 or 11 fans are used, then only three are allowed to fail.

If there are no backdraft dampers, and an overspeed redundancy is selected, the maximum allowed failures is one.

If there are no backdraft dampers, and an SBF redundancy is selected, the maximum allowed failures is equal to the number of standby fans.

9. SEQUENCING

9.1. Detection

1. The FAN COMM Controller will run through each of the fans and attempt to communicate with them via MODBUS.
2. The board will check each fan's previous type and attempt to detect that type first.
    a) If detected, each fan will be marked as either a 'DANFOSS', 'YASKAWA', 'ABB_ACH580', 'ABB_ACS320', or 'UNITRONICS'.
3. If no VFD is connected or if the board does not recognize the VFD, the drive will continue to attempt to communicate with the VFD if a specific type was previously detected. If no previous drive type was configured, the fan will not operate.

9.2. Running Cycle

1. The board will begin running a cycle and loop through the following code three times, once for each type of fan.
2. The board will check for drive issues and fan alarms, and set any alarm or array failure indicators as necessary.
3. The board will calculate the number of failed and non-failed fans.
4. The board will check if any of the force commands (**Force Run** and **Smoke Purge**) have been activated or if the **Run Enable** has been removed.

Note: These will overwrite the speed command that was given to the FAN COMM Controller from the VCCX.

   a) If **Smoke Purge** is active, the supply fan speed will be set to 0%, and the return and exhaust fans will be set to 100%.
   b) If **Force Run** is active, all of the fan speeds will be set to 100%.
   c) If **Run Enable** is removed, all of the fan speeds will be set to 0%.
   d) If **no** force commands are active, the FAC will bypass the overrides.

5. The board will then run the fans based on the redundancy type.

Note: If there is no redundancy set, all of the fans will run as commanded.

6. The board will operate as follows if there is only an SBF redundancy set:
   a) When operating with **no failures**, the SBF(s) are left off, but the others are turned on.
   b) When operating with **one fan failure**, the SBF(s) will turn on.
   c) When operating with **more than one failure**, all non-faulted fans will run until an array failure occurs.
7. The board will operate as follows if there is only an Overspeed redundancy set:
   a) When operating with **no failures**, it will run all fans as commanded.
   b) When operating **with failures**, the running fans will attempt to speed up to compensate for the lost fan(s). If enough fans fail that the overspeed command reaches 100%, any additional fan failures will reduce the total airflow, as all of the running fans are already at their max.
8. The board will operate as follows if both redundancies are set:
   a) When operating with **no failures**, it will leave the SBF(s) off and run the others.
   b) When operating with **one failure**, the SBF(s) will turn on.
   c) When operating with **more than one failure**, overspeed redundancy will turn on in an attempt to compensate for the lost fans.

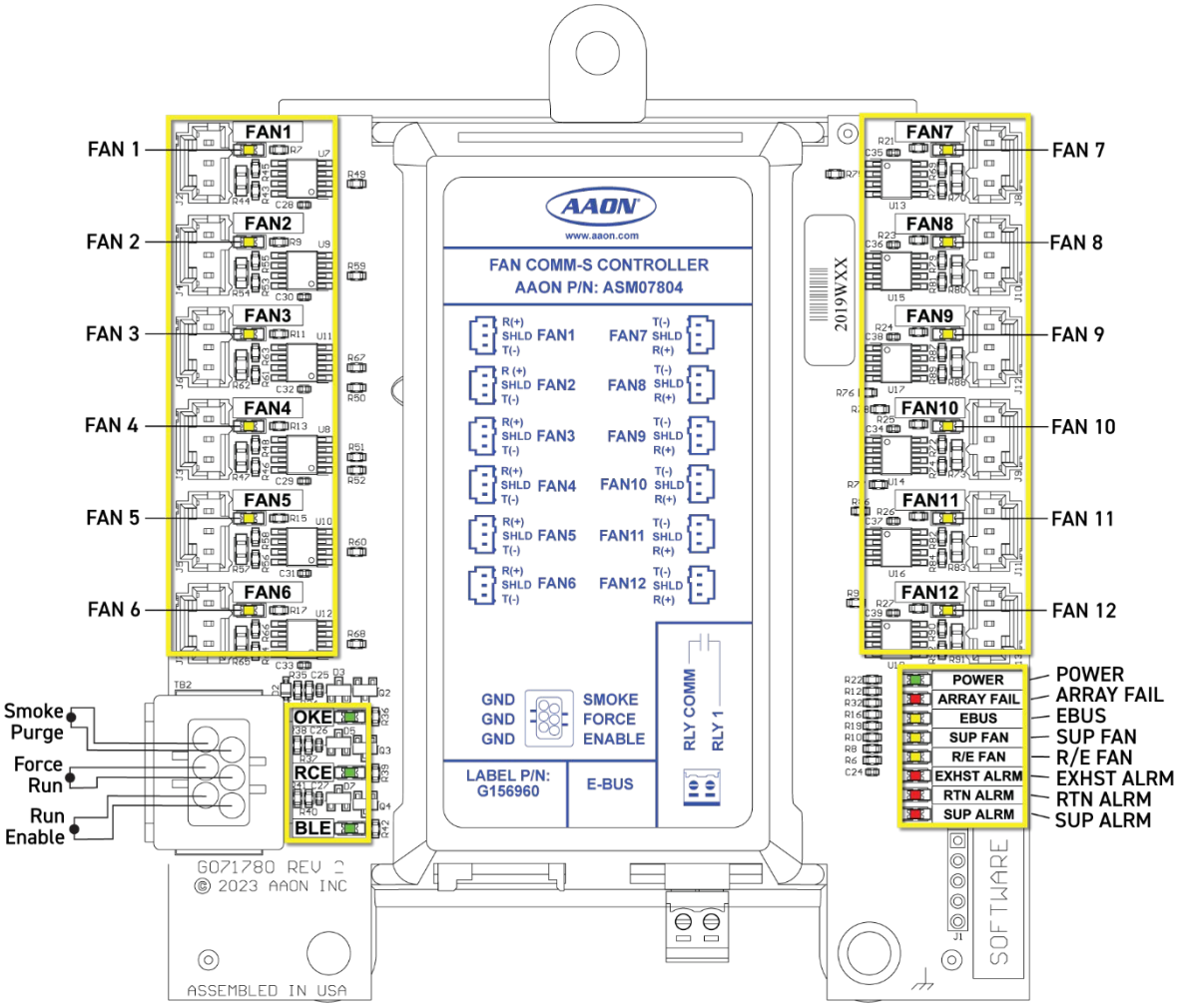
10. TROUBLESHOOTING

10.1. LED Diagnostics

- **ARRAY FAIL** - The red LED flashes when the board is in array failure, and the failure conditions are still present. The LED illuminates when the failure conditions have been cleared, but a reset is required.
- **EBUS** - The yellow LED flashes when the FAC responds to EBUS communications.
- **ENABLE** - The green LED illuminates when voltage is applied to the RUN ENABLE binary input.
- **EXHST ALRM** - The red LED illuminates when at least one exhaust fan VFD is in alarm.
- **FAN 1-FAN 12** - These yellow LEDs flash when the FAC attempts to communicate with the fan's VFD and will turn solid when the fans are in alarm.
- **FORCE** - The green LED illuminates when voltage is applied to the FORCE RUN binary input.
- **POWER** - The green LED turns on when power is applied to the board.
- **R/E FAN** - The yellow LED illuminates when the board is configured to have return and/or exhaust fans.
- **RTN ALRM** - The red LED illuminates when at least one return fan VFD is in alarm.
- **SMOKE** - The green LED illuminates when voltage is applied to the SMOKE PURGE binary input.
- **SUP ALRM** - The red LED illuminates when at least one supply fan VFD is in alarm.
- **SUP FAN** - The yellow LED Illuminates when the board is configured to have supply fans.

Note: FAN COMM Controllers use yellow LEDs to indicate compatible fan connections, helping to identify the controller being used more easily. The S Controller illuminates the SUP FAN LED, the R Controller illuminates the R/E FAN LED, and the SR Controller illuminates both.

10.2. LED Diagram



NOTE: The LEDs are the same for all FAN COMM Controllers.

11. APPENDIX A: FAN COMM PRISM SCREENS

11.1. Fan Array Settings

In the Prism 2 VCCX Controller Setpoints Miscellaneous tab, set the selections for the FAN COMM Controller in the Fan Array Settings.

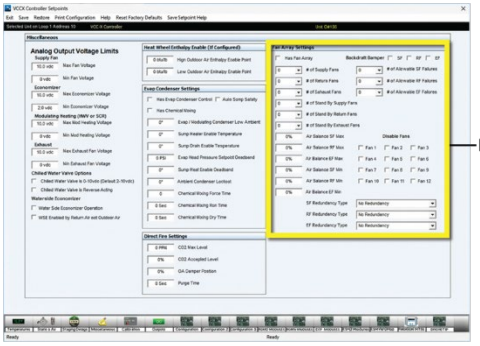


Figure 5: Fan Array Settings

11.2. Fan Array Status

In the Prism 2 VCCX Controller (Space with High OA Content) Screen, navigate to the Fan Array Status button in the bottom right corner. Click on the button to view the Fan Array Status window.

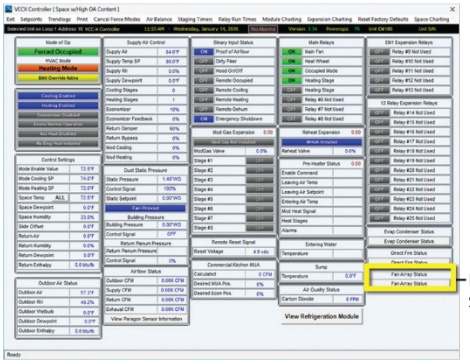


Figure 6: Fan Array Status Button

Figure 7: Fan Array Status Overview

11.3. Fan Array Alarms

In the Prism 2 VCCX Controller Alarm Status window, click on the Fan Array Alarms box to view the status of each fan.

Figure 8: Fan Array Alarms Menu

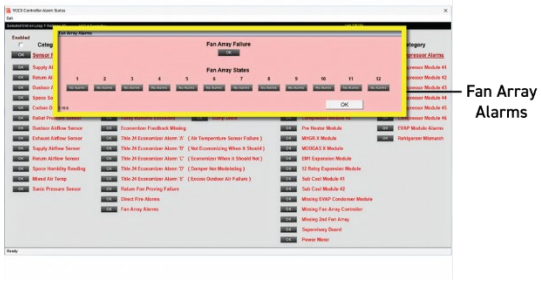


Figure 9: Fan Array Alarms Status Overview

12. LITERATURE CHANGE HISTORY

January 2026

Original version of the FAN COMM Controller Technical Guide.

AAON Controls Support:

Support.Controls@aaon.com

Controls Support Website:

www.aaon.com/aaon-controls-technical-support

AAON Factory Technical Support:

Technical.Support@aaon.com

Phone:

866-918-1100

Monday through Friday, 7:00 AM to 5:00 PM Central Time

Before calling Technical Support, have the model and serial number of the unit available.

For replacement parts, contact your local AAON Representative.

Are you an AAON Rep? Visit My AAON to open new support tickets, communicate directly with our support teams, and track your support progress in one place.

It is the intent of AAON to provide accurate and current product information. However, in the interest of product improvement, AAON reserves the right to change pricing, specifications, and/or design of its product without notice, obligation, or liability.