

The information contained herein is proprietary and is not to be used for purposes other than as an aid in the operation and/or maintenance of the of the product described herein and is not to be released or reproduced by anyone without the written permission of CleanAlert, LLC.

Due to CleanAlert's constant pursuit of product improvement, minor discrepancies may exist between the actual product, text, and illustrations. All information contained herein is based on the latest specifications at the time of publication and is subject to change without notice.

FILTERSCAN® and **AirFilterSentry™** are trademarks of CleanAlert, LLC.
Pat. www.cleanalert.com/legal/patents

Table of Contents

Introduction	2
In The Box	2
Tools Required	2
Safety	2
Application	3
FCC Compliance	3
IC Compliance	3
Sign Up and Configure AirFilterSentry Notification Service	4
FILTERSCAN <i>WiFi</i> Home Air Filter Monitor Installation	7
Applying Power - Model FS-245-C (15-24V AC/DC)	10
Applying Power - Model FS-245-B (Battery/Adapter)	10
Connect to Your Wireless Router	11
Connect to a Wireless Router With a WPS Button	11
WiFi Trouble-shooting Guide	12
Connect to a Wireless Router Without a WPS Button	13
Connect to the AirFilterSentry Notification System Server	16
Calibrating the FILTERSCAN <i>WiFi</i> Home Air Filter Monitor	17
Operation - FILTERSCAN <i>WiFi</i> Home Air Filter Monitor	18
System Monitoring	18
Alarm Modes	18
Clogged Air Filter	18
Low Battery	19
Battery Replacement	19
Malfunction	19
Calibrating When Installing a New Air Filter	19
Remote Reset	20
Automatic Adjustment	20
Software Updates	20
Frequently Asked Questions	21
Specifications	25
Warranty	25
<i>WiFi</i>	26
Transmitter	26
Remote Update	26
Revision History	26
Appendix	27
Glossary	27
Indicators	27
Local Alarm Indications	28
Various HVAC Configurations	29
Optional Dry Contact Relay Output	32
Disclaimer	32



Introduction

Congratulations on your purchase of the CleanAlert **FILTERSCAN® WiFi Home Air Filter Monitor**. The CleanAlert **FILTERSCAN WiFi Home Air Filter Monitor** continuously and automatically monitors the clogging* of an air filter installed into a household or commercial forced air heating, air conditioning, or heat pump system and provides alerts when the filter clogs and needs to be replaced.

The CleanAlert **AirFilterSentry™ Notification Service** (AFS) will send you a text message alert and/or email alert notifying you of the clogging* of an air filter installed into your household or commercial forced air heating, air conditioning, or heat pump system. The system monitoring service is located at www.cleanalertwifi.com where you may register your **FILTERSCAN WiFi Home Air Filter Monitor** and sign up for the CleanAlert **AirFilterSentry Notification Service**. You will receive text and or email notifications when your air filter reaches clogged* status. You can also check on the status of your air filter as it becomes more and more dirty over time.

***NOTE:** "Clogging" is defined as when the differential air pressure in the HVAC system doubles from its calibrated clean or new air filter value.

IMPORTANT!

Please read all instructions carefully to insure years of trouble-free operation.

In The Box

1. **FILTERSCAN WiFi Home Air Filter Monitor**, Model FS-245-B or FS-245-C
2. 4 Energizer Ultimate Lithium "AA" Batteries (FS-245-B model only)
3. **Read This First** document - **Critical**
4. Quick Start Guide
5. Drill Template to locate mounting holes in a return air plenum
6. Mounting Screws
7. Packaging / box
- *Optional:* CA-360 external AC/DC wall adapter power supply. (If ordered for the Model FS-245-B only, it is useful when there is a wall outlet available within 6' of the **FILTERSCAN** mounting location, and it eliminates the need for batteries.)
- *Optional:* CA-4DP Tubing Kit. (If ordered with either FS-245-B or FS-245-C, this 6' long Tubing Kit is used to have the **FILTERSCAN** monitor differential pressure across the air filter. It is especially useful when the **FILTERSCAN** is mounted in an attic or crawl space, or when the air handler is located outside the building (since the **FILTERSCAN** must be mounted indoors). Call or email to order longer length tubing.

Tools Required

1. Power Drill
2. 7/64" Drill bit
3. 3/8" Drill bit or Step Drill
4. #2 Phillips Screwdriver
5. Center Punch recommended
6. 1/2" Drill Bit (for Model CA-4DP Tubing Kit only)
7. Eye and Ear Protection
8. Dust Mask

SAFETY

WARNING! READ AND UNDERSTAND ALL INSTRUCTIONS.

Failure to follow all instructions may result in electrical shock or serious personal injury.

Application

FILTERSCAN WiFi Home Air Filter Monitor is an air filter clogging detection system. It has been designed to monitor the change in differential pressure as a result of dirt build up on an air filter and alert the user when the amount of clogging reaches a pre-determined threshold.

The **FILTERSCAN WiFi Home Air Filter Monitor** is compatible with most air filters ranging in differential pressure drop from 0.10" w.c. to 4.0" w.c. and with single and multi-speed blower HVAC systems, and most VAV (Variable Air Volume) systems. Note: The Monitor must be mounted downstream if the VAV system is set to the constant torque mode.

The **FILTERSCAN WiFi Home Air Filter Monitor** will transmit status conditions through your wireless Internet router to an Internet-based server database, which in turn sends text and/or email alerts to any smartphone (Android or iOS) or other Internet-connected device, such as a laptop, tablet, or desktop computer (PC or Mac). In order to utilize this feature you will need: (1) either (a) a wireless router with an operational *WiFi Protected Setup* (WPS) button, or (b) a wireless router without a WPS button and a separate *WiFi* enabled device such as a smartphone, tablet, or laptop, and (2) an **AirFilterSentry (AFS) Notification Service** account. You can check the status of your air filter at any time by logging into your AFS account and requesting a Filter Status report.

FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Contains FCC ID Number: **T9J-RN171**

IC Compliance

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme à Industrie Canada exempts de licence RSS norme. Opération est soumise aux deux conditions suivantes: (1) cet appareil ne peut pas causer de brouillage et (2) cet appareil doit accepter toute interférence, y compris les interférences pouvant causer un fonctionnement intempestif du dispositif.

Model: FS-245-B

Modèle: FS-245-B

Model: FS-245-C

Modèle: FS-245-C

Contains IC Certification/Registration Number: #6514A-RN171

Numéro de Certification / d'enregistrement les IC: #6514A-RN171

Sign Up & Configure AirFilterSentry Notification Service

Enter the Serial Number(s) and MAC Address(es) of your **FILTERSCAN WiFi** unit(s), which is(are) located on the top of the Monitor Housing(s) and on the side of the product box.

S/N _____ MAC 00:06:66:____:____:____

S/N _____ MAC 00:06:66:____:____:____

Go to www.cleanalertwifi.com to provide warranty information and to create an AFS account to configure your notification preferences and messages. You may sign up to two monitors in a single AFS Home account.

1. Select "All Warranty Registration" and enter the requested information (This information is appreciated but not required).
2. Then, select "Sign Up For AirFilterSentry".

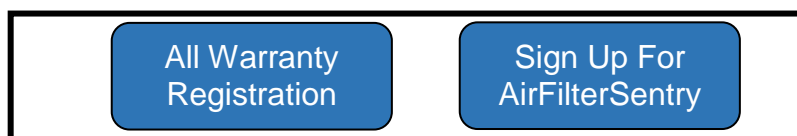


Figure 1: Home Page - Welcome Screen (Partial)

3. Enter your monitor information on the Sign Up page. If you plan to sign up two monitors in your AFS account, enter either serial number in the first text box below.

SIGN UP

All fields are required

Serial Number

First Name

Last Name

Email (account name)

Password

Note; Password must be a minimum of 8 characters. For security, use a mixture of upper- and lowercase letters, numerals, and "special characters".

*Re-enter Password

Read the Privacy Policy

Read the Terms and Conditions

☐ *I have read, understood, and agree to the terms of using this website.

Submit

Cancel

Figure 2: Sign Up Page - Create Login and Password

4. After submitting your monitor information on the Sign Up page, you will receive an email with an activation link. Upon clicking on that link your browser will open a web page as seen below. Note: The email entered upon Sign Up must be a valid email account to which you have access, otherwise you will not receive this confirmation email and will have to start the Sign Up process again.

Thank you for verifying your account.

Now, just sign in to complete the sign up process.

LOG IN

LOG IN BELOW

Email

Password

Cancel

Submit

Figure 3: From Confirmation Link to Login

- Log In to your account.
- The Edit Monitor page will appear. Enter the requested information.

ADD A FILTERSCAN WIFI UNIT required field are in bold

Location

Device Name

Serial #

MAC Address

Device Time Zone

Format for Notifications

Cell Phone Number for Text Notifications

Phone Help appears here

Phone

Email Addresses for Email Notifications

Email Help appears here

Email1

Text/Email Messages

Text/Email Message Help appears here

Clog Alert Text

☐ Location
 ☐ Device Name

Preview:

Battery Low Alert Text

☐ Location
 ☐ Device Name

Preview:

Malfunction Alert Text

☐ Location
 ☐ Device Name

Preview:

☒ Allow automatic updates to your FILTERSCAN software [What is this?](#)

Add FILTERSCAN WiFi

Cancel

Figure 4: Add Monitor Information

- a. You must name the Location – use a name or phrase that helps you identify where the **FILTERSCAN WiFi Home Air Filter Monitor** is located (home, beach house, Apt #37, etc.).
 - b. You must also name the Device – a name or phrase that whatever helps you identify the **FILTERSCAN WiFi Home Air Filter Monitor** (attic, basement, crawl space, etc.).
 - c. Enter the Monitor's Serial Number and MAC address, including the ":" between character pairs. Both the S/N and MAC were recorded previously in this manual, are located on the back of the monitor, and are located on the side of the Monitor box.
 - d. Select the Time Zone where the Monitor is located.
 - e. Select how you want to be notified: Email, Text, or Both.
 - f. Enter the smartphone number where you wish to receive text messages.
 - g. Enter the email address(es) where you wish to receive email messages.
 - h. Enter the text and email messages you wish to receive.
 - i. Check the Location and or the Device Name check boxes to automatically add those to the alert messages you select. The **"Preview"** shows you how the text and or email will appear.
 - j. Check the "Allow automatic updates to your FILTERSCAN WiFi software?" box if you want to receive automatic software updates. This remote update feature is transparent to you and no action is required after updates are installed.
 - k. Click "Update". This will send you to the Contact page.
7. Enter Contact Information.

We require your contact information for identification and site personalization. Read the [Privacy Policy](#) for information about how we handle your personal information.

ENTER CONTACT INFORMATION *required field

*First Name	<input type="text"/>
*Last Name	<input type="text"/>
Company	<input type="text"/>
*Email (account name)	<input type="text"/>
*Address 1	<input type="text"/>
Address 2	<input type="text"/>
*City	<input type="text"/>
Country	<input type="text"/>
State	<input type="text"/>
Province	<input type="text"/>
*Zip/Postal Code	<input type="text"/>
*Time Zone	<input type="text"/>
*Phone	<input type="text"/>

Submit

Figure 5: Contact Information

- After contact information is entered, you will be directed back to the Main Menu.

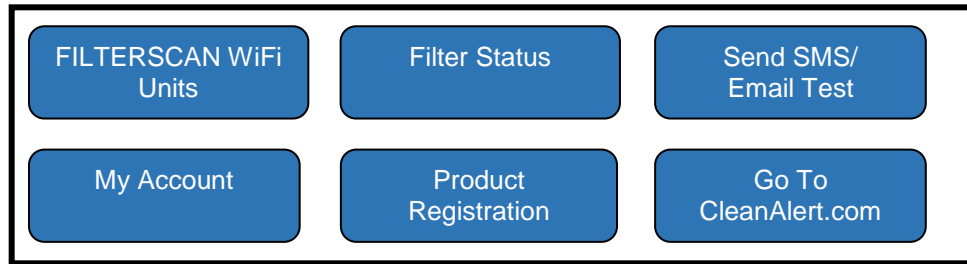


Figure 7: AirFilterSentry User Home Page

- Select "FILTERSCAN WiFi Units" from the Home Page, then select "Add FILTERSCAN WiFi".
- Follow the procedure in Step 6 to add additional monitors.
- If you need to change any information you've entered for any monitor, select "FILTERSCAN WiFi Units" from the Home Page, then click on "Edit FILTERSCAN WiFi".
- From the drop-down, select Location and Device for the unit to edit.
- Make the necessary changes and click on Update.
- Once all of your Monitors have been signed up, proceed to installation and connecting your monitor(s) to your WiFi router, after which you may begin viewing the online status reports available at www.cleanalertwifi.com.

NOTE: *If you will be using a corporate network to connect the monitor to the Internet, contact your network administrator prior to enabling the "Manual Pairing" steps in the Connecting to a Wireless Router Without a WPS Button section. Company policy may prohibit the use of web servers for security reasons. CleanAlert is not responsible for the use of, nor makes any claims as to the security of the web server interface over your network. The use of the web server is the responsibility of the end user.*

FILTERSCAN WiFi Home Air Filter Monitor

Installation

The CleanAlert **FILTERSCAN WiFi Home Air Filter Monitor**, Model FS-245, **MUST** be installed on the RETURN side plenum, or duct (if your HVAC system has no plenum), **NOT** the SUPPLY side (see the installation diagrams in the APPENDIX). The monitor can be installed, either upstream of, downstream of, or differentially across the air filter (using the optional tubing kit Model CA-4DP). The Monitor must be mounted downstream or differentially across the filter if you have a VAV system and it is set to the constant torque mode.

To help determine which installation position is possible with your HVAC system, refer to Figures 16 through 20, which illustrate various installation configurations, as well as the proper setting of the Upstream/Downstream switch.

WARNING!

Ensure that the HVAC system blower motor/fan is OFF until told otherwise!

WARNING!

Do NOT insert anything into the Sensor Tube! Doing so will result in sensor damage and malfunction.

- Insure you have recorded the Serial Number(s) and MAC address(es) as specified previously in this document.

2. The **FILTERSCAN WiFi Home Air Filter Monitor** should be attached to the external wall of the return air duct or plenum, either upstream or downstream from the air filter, and at least six inches from the filter or any other obstructions within the duct or plenum.
3. Locate an area on the return, preferably downstream from the air filter (that is, between the air filter and the HVAC system blower), large enough to place the Monitor template on a flat surface and where there are NO obstacles inside the duct or plenum. There should be sufficient clearance (6" minimum) from the surrounding walls and from any components within the HVAC system. If there is an obstruction such that the Monitor cannot be installed as described above, you may need to complete the installation using the optional CA-4DP Tubing Kit.
4. Tape the Monitor template at the location found in the previous step, such that "TOP" is facing upward. The **FILTERSCAN WiFi Home Air Filter Monitor** front panel must be clearly visible when installed.
5. Using the template, Drill one 3/8" hole for the sensor.
6. **For sheet metal plenum installation**, drill four small holes (7/64") for the mounting screws provided.
 - a. **Remove the Drill Template**
 - b. Attach the **FILTERSCAN WiFi Home Air Filter Monitor** by aligning its sensor tube with the larger hole and secure the Housing using the mounting screws supplied. The sensor tube does not extend into the duct.
7. **For Duct Board plenum installation**, follow the directions below. Otherwise go to Step 8.
 - a. Obtain Toggle Bolts (available at Home Depot)
 - (1) #1/8" x 2" SKU 261181 Package of 25 or
 - (2) #1/8" x 3" SKU 261203 Package of 25
 - b. Use toggle bolts that are one inch longer than the thickness of the duct board to allow the toggle to expand after inserting through mounting hole.
 - c. Drill 3/8" holes at the four **FILTERSCAN WiFi Home Air Filter Monitor** mounting hole locations (see Drill Template) as well as the Sensor Tube location.
 - d. Remove the Drill Template
 - e. Insert the bolt alone through the **FILTERSCAN** housing from the inside. Once through the housing, screw on the toggle a few threads such that the fins fold toward the housing. Do this for all four mounting holes.
 - f. Apply silicone sealant or air duct sealer to the inner sides of the toggle (see below) such that when the toggle expands inside the duct, the silicone will seal the hole and secure the toggle to the inside of the duct to help prevent the toggle from dropping into the duct if the screw is removed at a later date after the sealant has cured.



Figure 8: Toggle bolt for duct board installation

- g. Insert each toggle through the duct board holes, insuring the Sensor Tube aligns with the Sensor Tube hole.
- h. Once all four toggles are fully inserted through the duct board, lightly pull the housing away from the duct board while tightening each bolt, until all four are securely fastened, without crushing the duct board. Make sure the Sensor Tube seal has been squeezed between the housing and duct board to insure no air leakage.



Figure 9: Side view of FILTERSCAN WiFi monitor

8. **IMPORTANT!** Set the Upstream/Downstream switch shown in Figure 10 so that it matches the **FILTERSCAN WiFi Home Air Filter Monitor**'s position with respect to the air filter (that is, OFF for upstream mounting or ON for downstream or differential mounting). Please see the APPENDIX for 'Various HVAC Configurations for Monitor Installation' configurations.

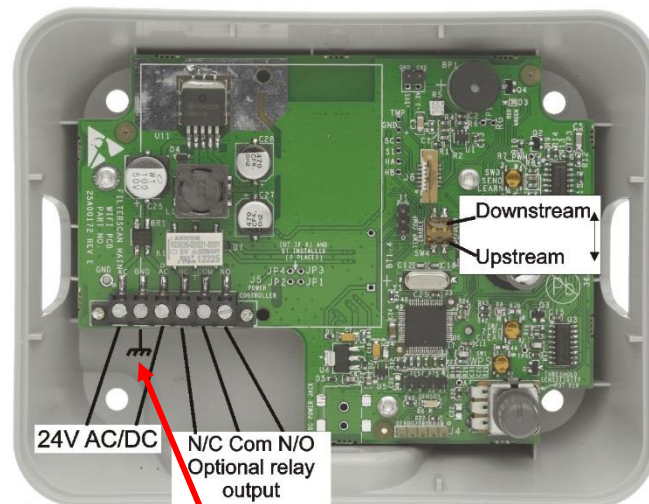
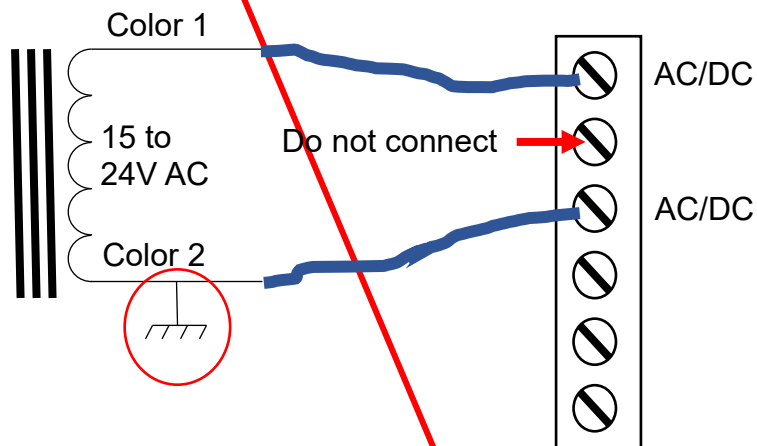


Figure 10: Inside of the FS-245-C FILTERSCAN WiFi monitor



Applying Power – Model FS-245-C (15-24V AC/DC)

SAFETY

This model product should only be installed by a licensed electrician.

1. This model is powered from the HVAC system's auxiliary 15 to 24 VAC/DC power supply and should be installed by a qualified electrician. A typical installation will have that power run through an installer-provided conduit to the **FILTERSCAN WiFi Home Air Filter Monitor**.
2. Locate the six terminals on the left-hand bottom corner of the printed circuit board illustrated in Figure 10. Connect 15 to 24V AC or DC to the 1st and 3rd leftmost terminals as shown. The 2nd leftmost terminal is for earth ground connection, if available. **DO NOT CONNECT IF THE HVAC SYSTEM'S AUX POWER HAS ANY LEG CONNECTED TO EARTH GROUND!**
3. The three terminals on the rightmost terminals are for connecting the optional dry contact relay output. Reference Figure 21 in the APPENDIX.
4. When power is applied, the beeper will sound momentarily and the **STATUS** LED will come on green momentarily, then turn on and remain red for approximately one minute. This indicates that the unit has not yet been calibrated to the air filter and HVAC system upon which it is installed. Additionally, the *WiFi* Status LED will blink a series of Red and Green. Wait until all blinking has stopped.
5. Go to Section **Connect to a Wireless Router**.

Applying Power – Model FS-245-B (Battery/Adapter)

1. This model is powered from either four AA batteries or an optional wall mount power adapter. If the adapter is installed, the batteries may remain in place or be removed. Insert four (4) AA batteries in the battery holder, making sure the positive and negative directions are exactly as illustrated in Figure 11. CleanAlert recommends using **Energizer® ULTIMATE LITHIUM** batteries. See section "Operation - **FILTERSCAN WiFi Home Air Filter Monitor**" for battery replacement.
2. When power is applied, the beeper will sound momentarily and the **STATUS** LED will come on green momentarily, then turn on and remain red for approximately one minute. This indicates that the unit has not yet been calibrated to the air filter and HVAC system upon which it is installed. Additionally, the *WiFi* Status LED will blink a series of Red and Green. Wait until all blinking has stopped.
3. Battery life is approximately one year when utilizing the **Energizer ULTIMATE LITHIUM batteries**. The use of other batteries, such as Alkaline, will significantly decrease battery life.



Figure 11: Inside the FS-245-B Monitor

Connect to a Wireless Router

Determine whether your router has a WPS button and where it is located. See page 14 if your router does not have a WPS button.

You are now ready to initiate communications between your **FILTERSCAN WiFi Home Air Filter Monitor** through your LAN (Local Area Network) via your wireless router to the **AirFilterSentry Notification Service server**.

Connect to a Wireless Router with a WPS Button

1. Depress the WPS button on your router for two to ten seconds until its *WiFi* LED begins to blink. See your router user's manual if you do not know what that button looks like. Timing varies with router manufacturers.
2. Reference Figure 12 to locate the **FILTERSCAN WiFi Home Air Filter Monitor** WPS button.
3. Within several seconds (time depends on your specific wireless router), using a nonmetallic instrument such as a pencil eraser, toothpick, or other non-metallic object, depress the WPS button just once until you feel a click and **immediately** release. A series of red, green, and amber *WiFi* Status Indicator flashes will occur, and finally go out. (NOTE: During a software update, amber flashes will occur for about two minutes before going out. **DO NOT TAKE ANY ACTION DURING THIS TIME!**) If a series of RED *WiFi* Status LED flashes occur at the end of the flashes, this means the monitor was unable to connect with the AirFilterSentry Notification server. The number of flashes indicates the reason for the failure to connect. Refer to Table 1 **WiFi Trouble-shooting Guide** below for further steps.

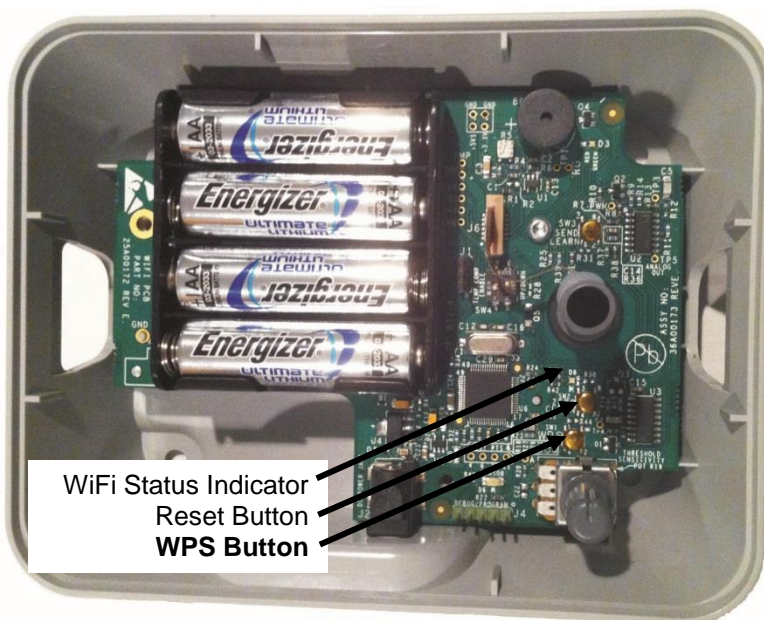


Figure 12: *WiFi* Status LED and WPS Button Locations

4. Your **FILTERSCAN WiFi Home Air Filter Monitor** is now connected to your wireless router, and has initiated a connection process where the **FILTERSCAN WiFi Home Air Filter Monitor** and

your wireless router communicate with each other and establish a connection with no further action needed.

NOTE: *If you will be using a corporate network to connect the monitor to the Internet, contact your network administrator prior to enabling the “Manual Pairing” steps in the Connecting to a Wireless Router Without a WPS Button section. Company policy may prohibit the use of web servers for security reasons. CleanAlert is not responsible for the use of, nor makes any claims as to the security of the web server interface over your network. The use of the web server is the responsibility of the end user.*

5. Go to “**Connect to the AirFilterSentry Notification System Server**” later in this manual.

Table 1 WiFi Trouble-shooting Guide Locate the internal **WiFi Status Indicator** above. (The Heartbeat and other normal, non-*WiFi* status indications which appear on the **STATUS** LED are shown elsewhere in this manual.)

LED Blink Indication	WiFi Status	Notes
None	Normal operation	
Flashes Red 1 time, pattern repeats 3 times.	Cannot find any WiFi device	Make sure wireless router is turned on
Flashes Red 2 times, pattern repeats 3 times.	Error Connecting to <i>WiFi</i> network after wireless router configuration	Check to insure other devices (laptop or mobile device) can connect to your wireless network
Flashes Red 3 times, pattern repeats 3 times.	Not paired with wireless router	See the “Connect to a Wireless Router” section and make sure wireless router is turned on
Flashes Red 4 times, pattern repeats 3 times.	Wireless router is off or not found	Make sure wireless router is turned on
Flashes Red 5 times, pattern repeats 3 times.	No Internet Connection	Check to insure the network cable to the router is connected, and there is Internet service
Flashes Red 6 times, pattern repeats 3 times.	Server registration failed. Serial number or MAC address does not exist in the AFS database.	Insure that the correct serial number and MAC address of the monitor appear in the “Edit Monitor” screen in your AFS account
Flashes Red 7 times, pattern repeats 3 times	Unacceptable character in SSID or Passphrase	See acceptable Special Character chart in the FAQ section
Slow Green Flashing	Software is waking	No action required
Fast Green Flashing	Connecting to server	No action required
Fast Yellow Flashing	Sending Status data to server	No action required
Fast Red Flashing	In process of resetting <i>WiFi</i>	No action required
Slow Yellow Flashing	The monitor is in the web server mode (see “Connect to a Wireless Router without a WPS Button”, or	Complete the instructions in the “Connect to a Wireless Router without a WPS Button” section
	Software is updating	No action required. Do not turn power off to monitor or router!

Connect to a Wireless Router without a WPS Button

Follow these steps if your wireless router **DOES NOT** have a WPS button or the Connect to a Wireless Router with a WPS Button procedure was unsuccessful. This is referred to as **Manual pairing**. There are two sets of instructions, one for Apple devices (iPhones or iPads) and one for Android devices (smartphones or tablets running the Android OS 6.0 or later).

Manual pairing using an Apple iPhone or iPad or PC Notebook:

1. Items needed:
 - a. An Apple iPhone or iPad.
 - b. The wireless password or passphrase for your router. **Password or passphrase must not contain unacceptable characters see below.**

Special Character Permissions in Network Name (SSID) & Password

<u>Character</u>	<u>SSID / Network Name</u>	<u>Password</u>
space	Yes	Yes
!	Yes	Yes
"	Yes	Yes
#	Yes	No
\$	No	No
%	Yes	Yes
&	Yes	No
'	Yes	Yes
(Yes	Yes
)	Yes	Yes
*	Yes	Yes
+	Yes	Yes
,	Yes	Yes
-	Yes	Yes
.	Yes	Yes
/	Yes	Yes
:	Yes	Yes
;	Yes	Yes
<	Yes	Yes
=	Yes	Yes
>	Yes	Yes
?	Yes	Yes
@	Yes	Yes
[Yes	Yes
\	Yes	Yes
]	Yes	Yes
^	Yes	Yes
_	Yes	Yes
`	Yes	Yes
{	Yes	Yes
	Yes	Yes
}	Yes	Yes
~	Yes	Yes

- c. The SSID of your wireless router (look on the side or bottom of the router or consult its manual)

- d. A strong WiFi signal (at least two bars) from the router where you want to install the FILTERSCAN WiFi monitor.
2. See Figure 12 to locate the **FILTERSCAN WiFi Home Air Filter Monitor** WPS button.
3. Depress and hold the **WPS** button until the *WiFi* Status Indicator blinks green then fast red. This usually takes about 5 seconds, but may take up to 30 seconds. Release the button as soon as the fast RED is seen and wait until the WiFi Status Indicator blinks amber.
4. Using your iPhone or iPad, go to the Settings app and **connect** to the FILTERSCAN network. It may take a few minutes for the FILTERSCAN network to appear.
5. Once the iPhone or iPad is connected to the FILTERSCAN network, open a web browser.
6. Enter the IP address **192.168.1.1** in the URL box

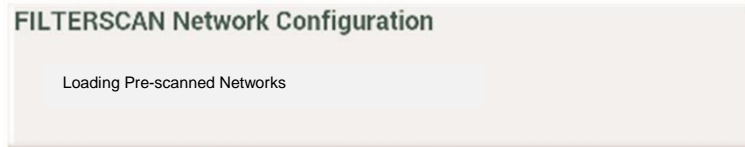


Figure 13: FILTERSCAN WiFi Network Configuration Page

7. Wait for the page to update and show the available networks. This may take several minutes. You are looking for the SSID of **your router**. If the expected network is not listed, press the **Refresh** button (you may need to do this several times). If it still does not appear, check that the router is on, has an Internet connection, and the SSID does not contain a \$ character.

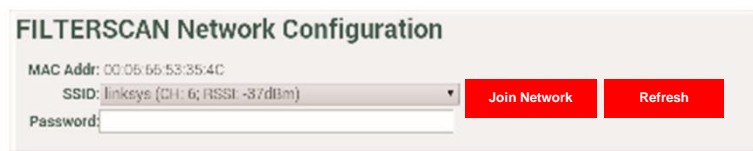
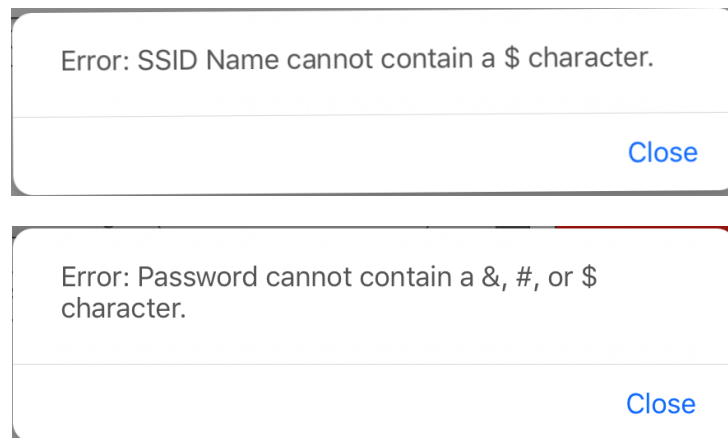


Figure 14: FILTERSCAN WiFi Network Configuration Page



8. Enter your router's password (**see acceptable Special Character chart above**) and press the Join Network button. If the pairing was successful, the amber light on the FILTERSCAN unit will flash quickly for a few seconds and then go out. If it is still flashing slowly, then it did not pair with the router. Check to insure that the password does not contain any of the special characters above.
9. If the pairing fails, check that you are using the correct password: On your iPhone, open up Settings and Select WiFi. Connect the phone to the router. Then press the "information" icon to the right of the router's SSID (and "i" inside a circle). On the new page select "Forget this Network". This will sever your connection and send you back to the WiFi page. Now select the router SSID. You will be asked to type in the password. If it is correct, you will connect. Now go back to repeat the above instructions starting at Step 4. If this fails, call the CleanAlert helpline: 888-414-3569, extension "2".

Supported network types for Manual pairing:

- WEP128
- WPA-PSK (TKIP)
- WPA2-PSK (AES)
- WPA-PSK mixed mode (some access points, not all are supported)

For WEP networks, the security key entered is the hexadecimal key, not the passphrase used to generate the key. WEP128 keys must be 26 digits long consisting of characters 0-9 and A-F.

Manual pairing using an Android smartphone or tablet

1. Items needed:
 - a. A smartphone or tablet with WiFi running Android 6.0 ("Marshmallow") or later.
 - b. The wireless password or passphrase for your router. **Password or passphrase must not contain unacceptable characters (see acceptable Special Character chart in FAQ section).**
 - c. The SSID of your wireless router (which you can find on the side or bottom of the router or by consulting its manual)
 - d. A strong WiFi signal (at least two bars) from the router where you want to install the FILTERSCAN WiFi monitor.
2. See Figure 12 to locate the **FILTERSCAN WiFi Home Air Filter Monitor** WPS button.
3. Depress and hold the **WPS** button until the *WiFi* Status Indicator blinks green then fast red. This usually takes about 5 seconds, but may take up to 30 seconds. Release the button as soon as the fast RED is seen and wait until the WiFi Status Indicator blinks amber.
4. Using your smartphone or tablet, connect to the FILTERSCAN network. You do this by going to the Settings app. It may take a few minutes for the FILTERSCAN network to appear.
5. Select the FILTERSCAN network in the list of available WiFi networks by pressing on and holding until a new window opens.
6. Select Modify Network, which cause the Advanced Options window to open.
7. Touch IP settings and select STATIC. A new text box will open.
8. Enter the IP address **192.168.1.1** in the URL box.
10. Then select SAVE. You will then press FILTERSCAN again without holding and choose to connect to the FILTERSCAN network. A window will then open with the message "This network has no internet access. Stay connected?"
11. Quickly open the message and select YES. **Note:** The message may only appear for a few seconds. If you do not select before it disappears, you will need to go back to step 4.
12. Open a web browser on your *WiFi*-enabled device.
13. Enter the IP address **192.168.1.1** in the URL box. You will get the FILTERSCAN Network Configuration page, displayed in Figure 13 above.
14. Wait for the page to update and show the available networks. This may take several minutes. You are looking for the SSID of **your router**. If the expected network is not available, press the "**Refresh**" button (you may need to do this several times). See Figure 14 above.
15. Enter your router's password (**see acceptable Special Character chart in FAQ section**) and press the Join Network button. If the pairing was successful, the amber light on the FILTERSCAN unit will flash quickly for a few seconds and then stop flashing. If it is still flashing slowly, then it did not pair with the router.
16. If the pairing fails, check that you are using the correct password: On your smartphone or tablet, open up Settings and Select WiFi. Connect the phone to the router if it is not already connected. If you are not asked for a password, press the router SSID and hold it until a window pops up. Choose "Forget Network." You will then be presented again with the list of available WiFi networks and select the one for your router. You will now be asked to enter the password. Enter it in the text box provided and press "connect." If the password you entered is wrong, this will fail. If you are able to connect, go back to step 4 and try to connect your phone with the FILTERSCAN again. If this fails, call the CleanAlert helpline: 888-414-3569 and select extension "2"

Supported network types for Manual pairing:

- WEP128
- WPA-PSK (TKIP)

- WPA2-PSK (AES)
- WPA-PSK mixed mode (some access points, not all are supported)

For WEP networks, the security key entered is the hexadecimal key, not the passphrase used to generate the key. WEP128 keys must be 26 digits long consisting of characters 0-9 and A-F.

*The **FILTERSCAN WiFi Home Air Filter Monitor** does not support # \$ and & (See acceptable Special Character chart in FAQ section) in the SSID (NETWORK NAME) or in WPA or WPA2 passphrases.*

17. Your **FILTERSCAN WiFi Home Air Filter Monitor** is now connected to your wireless router, and has initiated a connection process where the **FILTERSCAN WiFi Home Air Filter Monitor** and your wireless router communicate with each other and establish a connection with no further action needed.

NOTE: *If you will be using a corporate network to connect the monitor to the Internet, contact your network administrator prior to enabling the “Manual Pairing” steps in the Connecting to a Wireless Router Without a WPS Button section. Company policy may prohibit the use of web servers for security reasons. CleanAlert is not responsible for the use of, nor makes any claims as to the security of the web server interface over your network. The use of the web server is the responsibility of the end user.*

Connect to the AirFilterSentry Notification System Server

1. Upon successful sign up, configuration, installation, power up, and Internet connection, the **FILTERSCAN WiFi Home Air Filter Monitor** will be connected to the cleanalertwifi.com server through your wireless router and should require no further attention. The Monitor will start sending status messages to the server on a periodic basis.
2. To test the Internet connection:
 - a. Although the wireless transmission range should cover your building, it is greatest with minimum obstructions between the **FILTERSCAN WiFi Home Air Filter Monitor** and the wireless router. Any obstructions, such as walls, floors, and ceilings can reduce the range of transmission, and relocation of the wireless router may be required. Test location to ensure proper operation.
 - b. Depress the **SEND** button of the **FILTERSCAN WiFi Home Air Filter Monitor** once, and **immediately release**, to send status to the cleanalertwifi.com server database.
 - c. Then, login to your AFS account at www.cleanalertwifi.com to view your monitor's status.

NOTE:

Your **FILTERSCAN WiFi Home Air Filter Monitor** status display at the **AirFilterSentry Notification Service** is capable of displaying more than 100% clogged. This is possible since the “100% clogged” point is the recommended point when it is most efficient to service (replace or clean) the air filter. If you ignore the clog notification and continue to operate your HVAC system, the air filter will become dirtier. To provide the most efficient air filtration and HVAC system operation, you should service the air filter as soon as possible after being notified of a clogged condition.

Calibrating / Resetting the FILTERSCAN WiFi Home Air Filter Monitor



Figure 15: Front cover of the FILTERSCAN WiFi monitor

Important: If you are not going to calibrate your monitor immediately after installing your monitor, REMOVE one of the batteries. When ready to calibrate after initial installation, reinstall battery.

Install a clean, new air filter into your heating and cooling system.

Press and **immediately release** the **SEND** button to see if Calibration has already been started or done. A Red Status LED means Calibration has not yet been done. Continue.

1. After power is first applied, wait for approximately 15 seconds (warm up and stabilization time).
2. Turn the HVAC system **OFF** at the thermostat. Ensure the HVAC system blower is turned **OFF** and that no conditions exist during this part of the calibration that would cause air to be moving within the HVAC ducts, such as opening and closing of doors or windows.
3. Install a clean, new air filter into the HVAC system.
4. Depress the **RESET** button, holding for **two seconds** until the **STATUS** LED turns Green and a beep is heard.
 - a. After approximately ten seconds, the **STATUS** LED will blink yellow for approximately 20 seconds while the **FILTERSCAN WiFi Home Air Filter Monitor** records the HVAC system's FAN OFF condition. When the blinking amber stops, this indicates proper operation.
 - i. However, if the **STATUS** LED blinks red, which means the unit detects air flowing in the air duct, check to see that the system blower fan is **fully OFF** and that no condition described in #2 above exists. If no such condition exists, start again at #1. If the error condition persists, call 888-414-FLOW (3569) for instructions.
 - b. **IF YOU PRESS RESET BY MISTAKE**, press it again for 2 seconds until the Status LED blinks Amber and a beep is heard.
5. Wait at least one minute before turning your HVAC system ON – The **FILTERSCAN WiFi Home Air Filter Monitor** is starting the automatic calibration process during this time, calibrating itself to the air filter and HVAC system into which it is installed.
6. After the above, to verify communication with the AFS server, log into your AFS account, and select Filter Status, where you should see "OK" for Status or Device Health.

Your **FILTERSCAN WiFi Home Air Filter Monitor** is now completely operational, helping protect you from the consequences of running your HVAC system with a clogged air filter.

The **SERVICE FILTER** control is a fine tuning adjustment that has been calibrated during production to the mid-range, which is the Recommended Setting. This control allows the user to change the point at which the clog alarm will be triggered. Turning the **SERVICE FILTER** adjustment knob clockwise will

cause the **FILTERSCAN WiFi Home Air Filter Monitor** to issue an alarm at a lower level of filter clogging (less energy consumption). Turning the **SERVICE FILTER** adjustment knob counter-clockwise will cause the **FILTERSCAN WiFi Home Air Filter Monitor** to issue an alarm at a higher level of filter clogging (more energy consumption). See the FAQ Section for further information.

Operation - FILTERSCAN WiFi Home Air Filter Monitor

System Monitoring

The **STATUS** LED will blink green approximately once per minute (called a heartbeat) to indicate that the unit is functioning properly. Usually the **FILTERSCAN WiFi Home Air Filter Monitor** will be in the standby mode, conserving power. It wakes up periodically to monitor air filter condition, battery level, and system operation. If no alarm conditions are detected, the **FILTERSCAN WiFi Home Air Filter Monitor** goes back to sleep after several minutes of monitoring.

NOTE: Should there be a power failure the **FILTERSCAN WiFi Home Air Filter Monitor** will save all parameters such as the clean air filter calibration and the current state of the air filter. When power is restored, the **FILTERSCAN WiFi Home Air Filter Monitor** will continue operation with no user action required. The same applies when replacing depleted batteries.

Alarm Modes

The **FILTERSCAN WiFi Home Air Filter Monitor** provides both audible and visual local alarms indicating a clogged air filter, a low battery, or a system malfunction. In addition, the **AirFilterSentry** Notification Service allows remote monitoring* of system conditions. *Creating an account in the *AirFilterSentry Notification service is required to enable this feature.*

NOTE: The HVAC system blower fan must be running when the **FILTERSCAN WiFi Home Air Filter Monitor** attempts to check air filter condition. Since the **FILTERSCAN WiFi Home Air Filter Monitor** checks the air filter condition periodically, it may take several days to detect, trigger, and alert a clogged filter condition.

NOTE: The **FILTERSCAN WiFi Home Air Filter Monitor** has a light sensor which prevents audible alarms when there is no light present at the Monitor location. This prevents awaking occupants while sleeping and prevents needless beeping in a crawl space, attic, or other unoccupied location. The visual Status LED will still operate normally regardless of lighting conditions.

Clogged Air Filter

When the **FILTERSCAN WiFi Home Air Filter Monitor** detects a clogged air filter, an alert condition is triggered. The red **STATUS** LED will illuminate, blinking five times approximately every ten minutes until the alert condition is reset. There will also be an audio alert which corresponds to the visual alert indication. **NOTE:** Allowing this alarm condition to go on indefinitely will drain the batteries (-B model only). The clogged filter alert is reset by following the instructions in the section "Calibrating When Installing a New Air Filter" below. In addition, a text and/or email will be sent to a designated person if you have signed up for the **AirFilterSentry** Notification Service.

NOTE: A new or cleaned air filter should always be installed whenever the **CALIBRATE** (depressing the Reset button) operation is performed.

Low Battery

When the **FILTERSCAN WiFi Home Air Filter Monitor** detects a low battery condition, an alert condition is triggered. The **STATUS** LED will blink yellow approximately once per minute to indicate a low battery in the Monitor. Replacing the Monitor batteries (see APPENDIX) will reset the alert condition. In addition, a text and or email will be sent to a designated person if you have signed up for the **AirFilterSentry** Notification Service.

Battery Replacement

Access: Remove the front cover from the **FILTERSCAN WiFi Air Filter Monitor** housing (see Figure 9). Remove the batteries.

Installation: Insert four (4) **Energizer® ULTIMATE LITHIUM** batteries in the battery holder of the **FILTERSCAN WiFi Home Air Filter Monitor**, observing polarity, and replace the front cover.

Malfunction

When the **FILTERSCAN WiFi Home Air Filter Monitor** detects an internal malfunction or an operator error, an alert condition is triggered. The red **STATUS** LED will illuminate continuously for approximately 20 seconds. In addition, a text and or email will be sent to a designated person if you have signed up the monitor in the **AirFilterSentry** Notification Service. There are two conditions that can cause a “malfunction”:

1. In the unlikely event an internal malfunction should occur, remove power from the **FILTERSCAN WiFi Home Air Filter Monitor** by removing the batteries, unplugging the optional AC Adapter, or in the case of 15-24V AC/DC-powered models (“-C”) contacting your HVAC system electrician to have the power to the Monitor turned off. Wait for a minute and restore power. If your **FILTERSCAN WiFi Home Air Filter Monitor** unit is operating with both AC Adapter and batteries installed, both will need to be removed in order to reset the malfunction. If this does not reset the malfunction alert, call 888-414-FLOW (3569) for instructions.
2. If you recently replaced the air filter and “Reset” the **FILTERSCAN WiFi Business Air Filter Monitor**, and the monitor detects that the Calibration / Reset process has not completed properly, a malfunction alert will occur. To clear the alert, remove power from the **FILTERSCAN WiFi Home Air Filter Monitor** by removing the batteries, unplugging the optional AC Adapter, or in the case of 15-24V AC/DC-powered models (“-C”) contacting your HVAC system electrician to have the power to the Monitor turned off. Wait for a minute and restore power. If your **FILTERSCAN WiFi Home Air Filter Monitor** unit is operating with both AC Adapter and batteries installed, both will need to be removed in order to reset the malfunction. Then, insure you have turned the HVAC system blower **OFF**, the first step before replacing your air filter. Depress **Reset** to restart the calibration process. Reference the instructions on the monitor cover.

Calibrating When Installing a New Air Filter

Whenever a new air filter is installed, the **FILTERSCAN WiFi Air Filter Monitor** must be calibrated. Calibration establishes the clogged air filter detection threshold based upon the condition recorded for a new air filter. When a new air filter is installed, its condition is recorded and saved in nonvolatile memory. Reference the instructions on the monitor cover.

1. Turn the HVAC system **OFF** at the thermostat. Ensure the HVAC system blower is turned **OFF** and that no conditions exist during this

- part of the calibration that would cause air to be moving within the HVAC ducts, such as opening and closing of doors or windows.
2. Install a clean, new air filter into your heating and cooling system.

Remote Reset

If the **FILTERSCAN WiFi Home Air Filter Monitor** is mounted in a location away from the air filter, such as when the monitor is mounted at the HVAC system in an attic or crawl space and the air filter is mounted on a wall within your home, you may replace the air filter, log into your AFS account, select Filter Status, then click on the “Reset this monitor” button. Your **FILTERSCAN WiFi Home Air Filter Monitor** will automatically calibrate / Reset itself over the next few days. Note that this button should only be clicked on AFTER replacing or installing a new, clean air filter. In addition, if you run your HVAC blower continuously (thermostat Fan switch placed to ON rather than Auto), you must turn the HVAC system **OFF** at the thermostat, leaving it **OFF** for approximately 8 hours to insure a proper **OFF** condition is recorded.

NOTE: Steps 3 thru 5 are not required when performing **Remote Reset**.

3. Depress the **RESET** button, holding for **two seconds** until the **STATUS** LED turns Green and a beep is heard.
 - a. After approximately ten seconds, the **STATUS** LED will blink yellow for approximately 20 seconds while the **FILTERSCAN WiFi Home Air Filter Monitor** records the HVAC system’s FAN OFF condition. When the blinking amber stops, this indicates proper operation.
 - i. However, if the **STATUS** LED blinks red, which means the unit detects air flowing in the air duct, check to see that the system blower fan is fully OFF and that no condition described in #2 above exists. If no such condition exists, start again at #1. If the error condition persists, call 888-414-FLOW (3569) for instructions.
 - b. **IF YOU PRESS RESET BY MISTAKE**, press it again for **two seconds** until the Status LED blinks Amber and a beep is heard.
4. Wait at least one minute before turning your HVAC system ON – The **FILTERSCAN WiFi Home Air Filter Monitor** is starting the automatic calibration process during this time, calibrating itself to the air filter and HVAC system into which it is installed.
5. You may, after the above steps, want to verify communication with the AFS server. Log into your AFS account, and select Filter Status, where you should see “OK” for Status or Device Health.

Your **FILTERSCAN WiFi Home Air Filter Monitor** is now calibrated to the type of air filter you have installed. Due to air filter types and manufacturing tolerances, you will need to calibrate the **FILTERSCAN WiFi Home Air Filter Monitor** each time a new air filter is installed.

Automatic Adjustment

ATTENTION - HVAC systems with two-speed blowers! Typical HVAC systems will have different blower speeds for Heat and A/C. The **FILTERSCAN WiFi Home Air Filter Monitor** automatically adapts to the changes in HVAC blower speeds.

Software Updates

The **FILTERSCAN WiFi Home Air Filter Monitor** has the capability of automatically updating its software through its Internet connection to the cleanalertwifi.com server. If you checked the “Allow Automatic Updates to your **FILTERSCAN** Software?” box on the Edit Monitor screen and there is a later version of software available on the server, your **FILTERSCAN WiFi Home Air Filter Monitor** will automatically download the latest

version of software and update itself without any action by you. The update will be transparent and all operating parameters will be intact after the update.

Frequently Asked Questions (FAQ's)

All Models

Can the **FILTERSCAN WiFi Home Air Filter Monitor** be mounted on the supply side of the HVAC blower?

No, only on the return side duct, either upstream or downstream of the air filter or differentially across the air filter.

Can I install the **FILTERSCAN WiFi Home Air Filter Monitor** on a multi-speed blower HVAC system?

Yes.

Can I install the **FILTERSCAN WiFi Home Air Filter Monitor** on a Variable Air Volume (VAV) HVAC system?

*As of the writing of this manual, the **FILTERSCAN WiFi Home Air Filter Monitor** will operate with most VAV systems in production.*

Note: The Monitor must be mounted downstream if the VAV system is set to the constant torque mode.

What effect, if any, does opening or closing air vent registers have on the **FILTERSCAN WiFi Home Air Filter Monitor** performance after it has been calibrated to a new air filter?

Any significant changes in HVAC system pressure caused by register changes or other factors will change the point at which the clog alert will occur. The greater the number of system registers, the less effect on the system's pressure when one or two registers are changed and therefore the less effect on when the clog alert will occur. Regular changes to system registers could make the performance unpredictable. In these cases, an optional Tubing Kit is recommended.

What if my **FILTERSCAN WiFi Home Air Filter Monitor** stops sending status data? What if the Status report at my AirFilterSentry Notification Service account does not display a recent update Date?

There could be many causes for data to not reach the AFS server.

- 1. First, depress the **SEND** button on the **FILTERSCAN WiFi Home Air Filter Monitor** front panel and **immediately** release. Wait for one minute then recheck the AFS Status Display for a current update time and date.*
- 2. Next, check the **FILTERSCAN WiFi Home Air Filter Monitor** power. Insure batteries or power to the Monitor is good (Status LED blinks green approximately once per minute).*
- 3. Turn power off to the **FILTERSCAN WiFi Home Air Filter Monitor** power for one minute. Then turn power back on.*
- 4. Turn power off to your wireless router for one minute. Then turn power back on.*

*If none of the above result in updated status data, please review **Table 1 WiFi Status indications** above for various WiFi Status LED conditions.*

Where should I set the Service Filter knob?

At the recommended setting in the center of travel. This equates to the doubling of the initial differential pressure to cause a clog alert.

If you want to waste energy, or think your filter is not dirty enough when a clog alert occurs at the Recommended setting, you may turn the Service Filter knob CCW toward “Less Often”. This increases the differential pressure needed to cause a clog alert. Results? A more dirty filter, more energy usage, and decreased IAQ.

If you want to save more energy at the expense of higher air filter costs, or think your filter is too dirty when a clog alert occurs at the Recommended setting, you may turn the Service Filter knob CW toward “More Often”. This decreases the differential pressure needed to cause a clog alert. Results? A cleaner filter, higher air filter costs, less energy usage, and increased IAQ.

Overall, the Service Filter knob should be set at the Recommended setting for the best balance between wasted energy and higher air filter costs.

Why am I not seeing the **FILTERSCAN** on the list of connected devices on my router?

*The **FILTERSCAN WiFi Home Air Filter Monitor** connects to your wireless router for about two seconds approximately every seven hours. The rest of the time, the **FILTERSCAN**’s WiFi transmitter is turned off to conserve energy. So, you would have to be viewing your “connected devices” exactly during the two-second time period to “see” the **FILTERSCAN** on the list of connected devices. Nearly impossible.*

Model FS-245-C

How is the conduit mechanically connected to the **FILTERSCAN WiFi Home Air Filter Monitor**?

There is a conduit connector knock-out located on the lower side of the monitor housing.

What voltage is acceptable to power the **FILTERSCAN WiFi Home Air Filter Monitor** via the conduit?

Typically 24V AC/DC, although an input voltage as low as 15V DC is acceptable.

Model FS-245-B

Do I have to install batteries if I power the Monitor from the optional AC Adapter?

No.

Can I utilize both the AC Adapter and batteries for backup?

Yes, you can install batteries even though you also have an AC adapter installed. Such power backup is unnecessary however because the monitor’s non-volatile memory stores all operating parameters in the event of a power failure.

AirFilterSentry

Can I transfer ownership of my **FILTERSCAN WiFi Home Air Filter Monitor** to another person?

Yes, please contact Customer service at 888-414-FLOW (3569) for assistance. For the monitor to be transferred, have the Serial Number and the new owner’s information available.

An email will be sent to the current owner of the monitor notifying them of the request. They, must either accept or decline the request, within the email.

If accepted, the monitor's data is moved to the new owner's (requester's) AFS account. Personalized information is changed in that monitor's record (Device Name, Location, text message format, etc.). New generic information is inserted to prevent the new owner from seeing the prior owner's information.

If declined, no changes are made to monitor ownership.

*The new owner to receive the **FILTERSCAN WiFi Home Air Filter Monitor** will receive an email notification of the current owner's action.*

If the transfer was accepted, the requesting (new) owner will see the monitor in their monitor list when they go into the Edit Monitor page.

If the transfer was declined, the monitor will remain in the current owner's account.

Wireless Router

What should I do if I am unable to connect my monitor to my wireless router?

1. *If you are pairing your monitor with your router using WPS, make sure that WPS is enabled on the router by trying to connect another wireless device to the router using WPS (some routers have this function disabled), or contact your router supplier.*
2. *If you are using manual pairing, make sure that you have the correct password.*
3. *Make sure you monitor is within range of your wireless router. If not, you may have to relocate your router.*
4. *Determine your routers wireless security network type.*

Supported network types are:

- WEP128
- WPA-PSK (TKIP)
- WPA2-PSK (AES)
- WPA-PSK mixed mode (some access points, not all are supported)

To do this, you will need to consult your routers manual. If your routers wireless security has been set to any other method, you will need to change it to one of the above, preferably WPA-PSK (TKIP) or WPA2-PSK (AES).

5. *Make sure network SSID Name and password conform to the Special Character Permissions in Network Name (SSID) & Password chart in the **Connecting to a Wireless Router Without a WPS Button** section.*

How far can the **FILTERSCAN WiFi Home Air Filter Monitor** be mounted from the wireless router?

The range of the WiFi signal is similar to the range of your wireless devices (laptop, smartphone, etc.). However, obstacles such as walls between the Router and Monitor could decrease the effective range of the device.

Multiple Monitors

What if my building has multiple HVAC systems, each with their own **FILTERSCAN WiFi Home Air Filter Monitor**. Will the

AirFilterSentry Notification Service allow access of all Monitors within one account?

Yes, you can sign-up one or two monitors in one AFS Home account. Contact Customer service at 888-414-FLOW (3569) if you would like to add more than two monitors to an AFS account.

Specifications

Differential Pressure Range	Near zero to 4.0 in w.c.
Clog Filter Trigger Point	1.5 to 2 times initial differential pressure (at the recommended setting on the SERVICE FILTER control)
Temperature Range	32° to +122° F (0° to +50° C) Operating -40° to +185° F (-40° to + 85° C) Storage
Humidity	80% RH, non-condensing
Power Requirements (-B)	6.0 VDC at 90 mA Transmitting, <20 uA Standby
Batteries, Monitor (-B)	(4) AA 2400 mAH
Battery Life	Approximately 1 year
Power Requirements (-C)	15 to 24 VAC/DC at 11 mA Transmitting, <20 mA Standby
Insertion Depth into Duct	Does not extend into duct
Local Clogged Air Filter Alert	Red STATUS LED & 2 KHz Beeper alternating ON & OFF five times
Low Battery Alert	Yellow STATUS LED blinking approximately once per minute
Malfunction Alert	Red STATUS LED continuously illuminated
Wired Output	Pulsing 0 V to 5 VDC @ 18 mA max upon clog or low battery alert
Relay Output	Optional one form C dry contact @ 500 mA max – Model FS-245-C
Text & E-Mail Notification**:	User configurable SMS text messaging and e-mail
Indicators:	Green / Yellow / Red Status LED and audible beeper
Electrical Connections:	Power - 2.5mm barrel jack mates to wall adapter: Model FS-245-B, or Power - Conduit into terminal block, 14-30 AWG: Model FS-245-C Output - Conduit into terminal block, 14-30 AWG: Model FS-245-C
Mounting	5 holes, 4 @ 7/64" and 1 @ 3/8"
Monitor Dimensions	6" x 4.625" x 1.5"
WiFi Module	FCC/CE/IC certified 2.4-GHz IEEE 802.11b/g transceiver
WiFi Authentication	Secure using WPA-PSK (TKIP), and WPA2-PSK (AES)
Transmission Range	Within your building similar to other <i>WiFi</i> devices, depending upon line-of-sight and obstacles
FCC Identification #	Contains FCC ID Number: T9J-RN171
Industry Canada #	Contains IC Certification/Registration Number: #6514A-RN171

** Requires an AirFilterSentry Notification Service account, Internet connection, and wireless router.
Specifications are subject to change without notice.

Warranty

Limited warranty Please refer to www.cleanalert.com/termsofsale.html for full warranty text.

For a period of one (1) year following the date of purchase of the Product, if the Product ceases to function and/or functions improperly due to a defect in material or workmanship, CleanAlert, LLC will repair or replace the Product (at its sole discretion) free of charge to the customer. This warranty does not apply to:

1. Damage caused by accident, abuse or mishandling of the Product after it has left CleanAlert, LLC's facility;
2. Acts of God;
3. Units which have been subject to unauthorized repair and/or have been taken apart or otherwise modified;
4. Units damaged from installation or use not in accordance with these instructions;
5. Damages exceeding the cost of the Product; and
6. Damages that are considered normal wear and tear (in CleanAlert, LLC's sole discretion).

A Product requiring warranty service shall be sent by the customer to CleanAlert's facility in Paoli, PA. This warranty does **NOT** cover the costs of having the Product transported to CleanAlert, LLC for warranty service. The customer is responsible for safely sending the Product to CleanAlert, LLC.

WiFi

Transmitter

The **FILTERSCAN WiFi Home Air Filter Monitor** contains a *WiFi* radio module operating at a frequency of 2.4GHz, which is activated periodically. Transmissions to the **AirFilterSentry Notification Service**, are very short in duration.

Each **FILTERSCAN WiFi Home Air Filter Monitor** has been assigned a unique MAC address at the time of manufacture.

Remote Update

The **FILTERSCAN WiFi Home Air Filter Monitor** has the ability to allow the cleanalertwifi.com server to update the Monitor software. During user configuration on the **AirFilterSentry Notification Service** website, if you checked the "Allow Automatic Updates to your **FILTERSCAN Software**?" box on the Edit Monitor screen and there is a later version of software available on the server, your **FILTERSCAN WiFi Home Air Filter Monitor** will automatically download the latest version of software and update itself without any action by you. The update will be transparent and all operating parameters will be intact after the update.

1. Software updates will be made available by the **AirFilterSentry Notification Service**.
2. When an update is made available, the Notification Service will send an update command to the **FILTERSCAN WiFi Home Air Filter Monitor** in response to the Monitor's periodic status message.
3. If you've elected to receive automatic updates, the Monitor then downloads and validates the new software.
4. No further action is required on your part.

Revision History

Rev. #	Effective	Summary:
4.00	7/21/16	Updated for Auto-Calibration and Android network connection operation
4.02	9/9/16	Updated alarm functions
4.03	1/12/17	Revised and added Special Character statements for SSID and passphrase
4.04	2/24/17	Added AFS Transfer FAQ
5.1	10/3/17	Revise from Basic to Home
5.2	11/10/17	Added new FILTERSCAN Logo
5.3	3/23/18	Revise from AFS 2.x to 3.0 and Added Remote Reset feature
5.4	6/13/18	Revised "Malfunction" section improving clarity
5.5	8/6/18	Added screen shot at Figure 14

Appendix

Glossary

HVAC	Heating, ventilation, and air conditioning
Dirty Air Filter	An air filter which has been in use and has collected some amount of dirt or dust particles that discolor the filter fibers or element but do not substantially affect the air flow through it.
Clogged Air Filter	An air filter which has collected a sufficient amount of dirt or dust particles to not only discolor the filter fibers or element but decrease the air flow through the filter as well. The FILTERSCAN WiFi Home Air Filter Monitor typically identifies a filter as clogged when the differential pressure within an HVAC system increases to 1.5 to 2 times the initial differential pressure identified when the unit was calibrated with a clean filter.
Monitor	The sensor voltage detection and signal processing portion of the system.
AirFilterSentry.....	The application software and database residing on the cleanalertwifi.com server that provides all operational aspects of the AirFilterSentry Notification Service .
Cleanalertwifi.com Server	The computer server on which the AirFilterSentry Notification Service resides and operates. The hosting service ensures database backups and redundancy to provide maximum up-time of their systems.
MAC Address	Media Access Control unique identifier assigned to the <i>WiFi</i> radio within the FILTERSCAN WiFi Home Air Filter Monitor .

Indicators

Green STATUS LED.....	The blinking Green STATUS LED at the FILTERSCAN WiFi Home Air Filter Monitor indicates normal operation.
Yellow STATUS LED.....	The blinking Yellow STATUS LED at the FILTERSCAN WiFi Home Air Filter Monitor indicates a process is occurring and can also indicate a low battery condition at the Monitor or Receiver.
Red STATUS LED.....	The Red STATUS LED at the FILTERSCAN WiFi Home Air Filter Monitor is an alarm indicator which blinks whenever an alarm condition occurs.
Beeper.....	The audible beeper at the FILTERSCAN WiFi Home Air Filter Monitor is an alarm indicator which beeps whenever certain alarm conditions occur.

Local Alarm Indications

Monitor/Transmitter Alarm Indications

Alarm Condition	Alarm Indication	Clear Alarm Procedure
Normal Operation	STATUS LED flashes green every minute.	None
Clogged Filter	STATUS LED flashes red five times every ten minutes. Beeper sounds with LED flash, if ambient light is present.	Replace Filter and Recalibrate
Low Battery	STATUS LED flashes yellow every minute.	Replace Batteries
Sensor Failure	STATUS LED continuously on red for 5 seconds, every 10 minutes. Beeper sounds with LED, if ambient light is present.	Contact CleanAlert Customer Service at 888-414-3569

Various HVAC Configurations for Monitor Installation

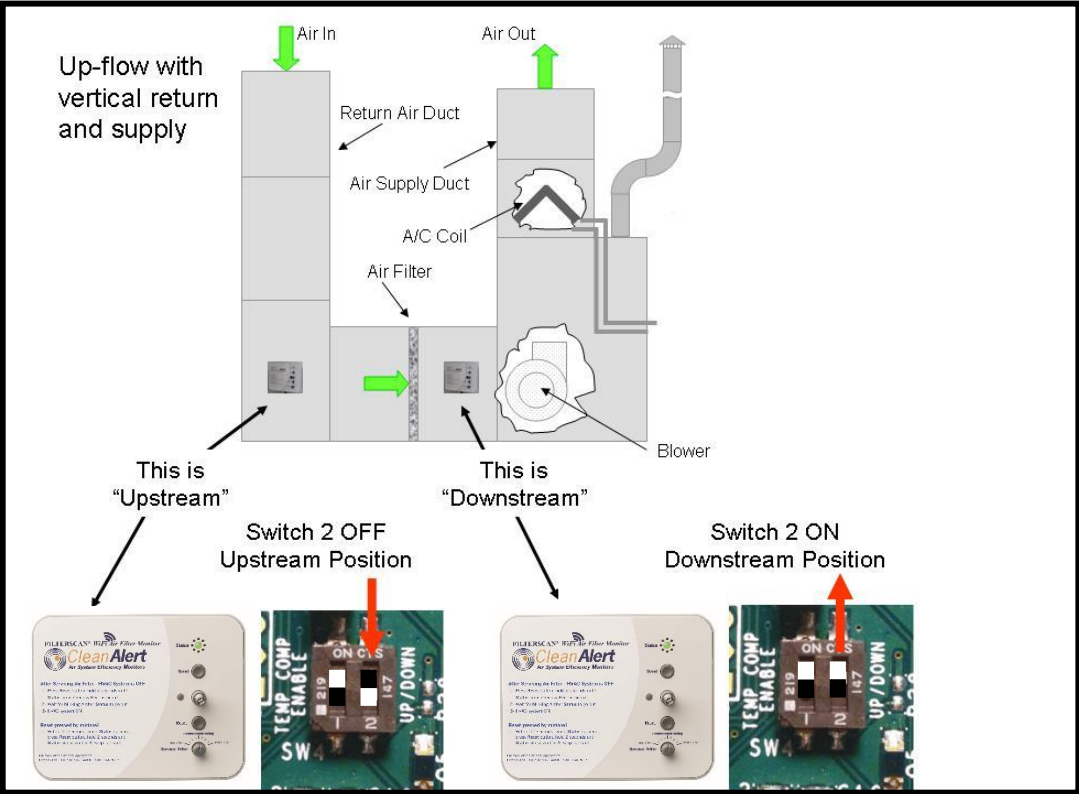


Figure 16: Installation on HVAC systems with vertical return and supply ducts

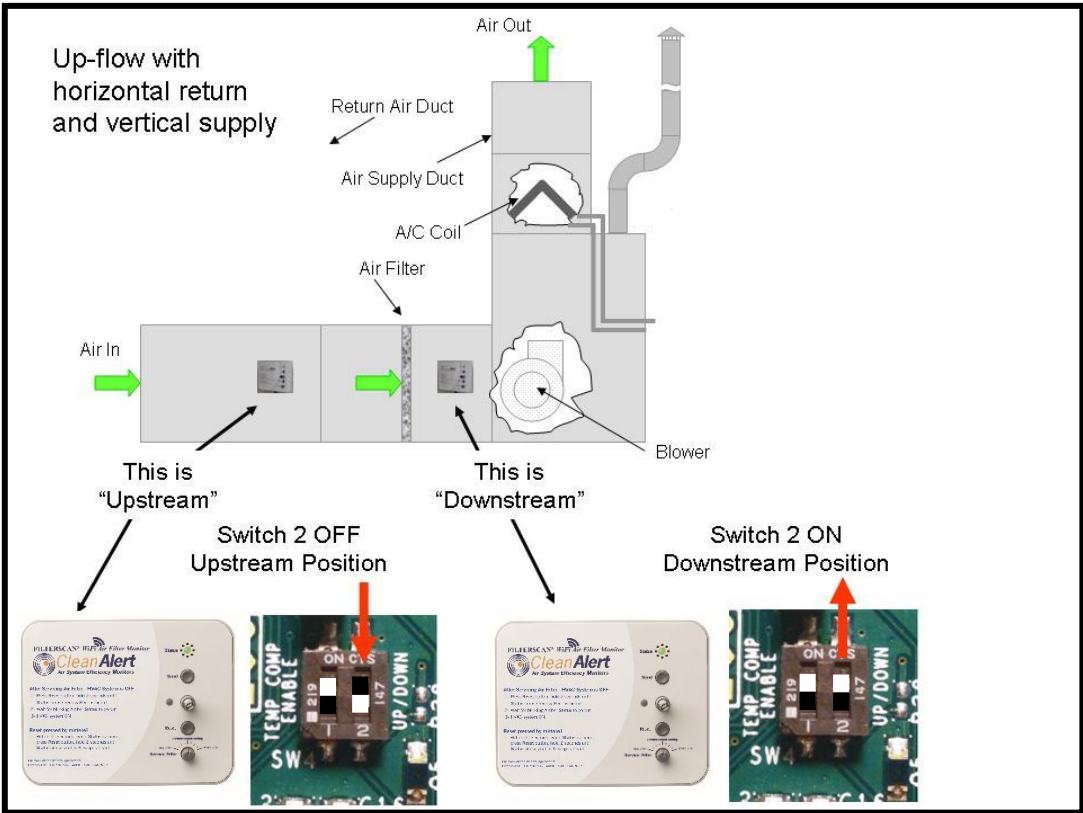


Figure 17: Installation on HVAC systems with horizontal return and vertical supply ducts

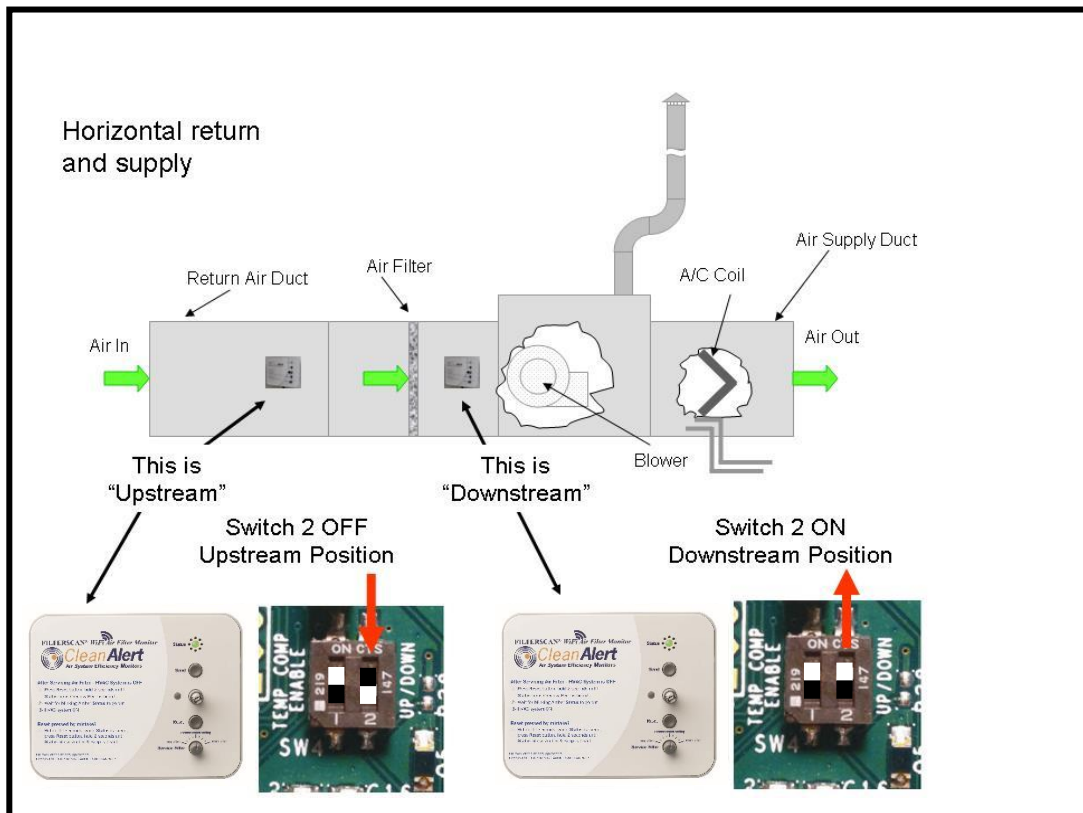


Figure 18: Installation on HVAC systems with horizontal return and supply ducts

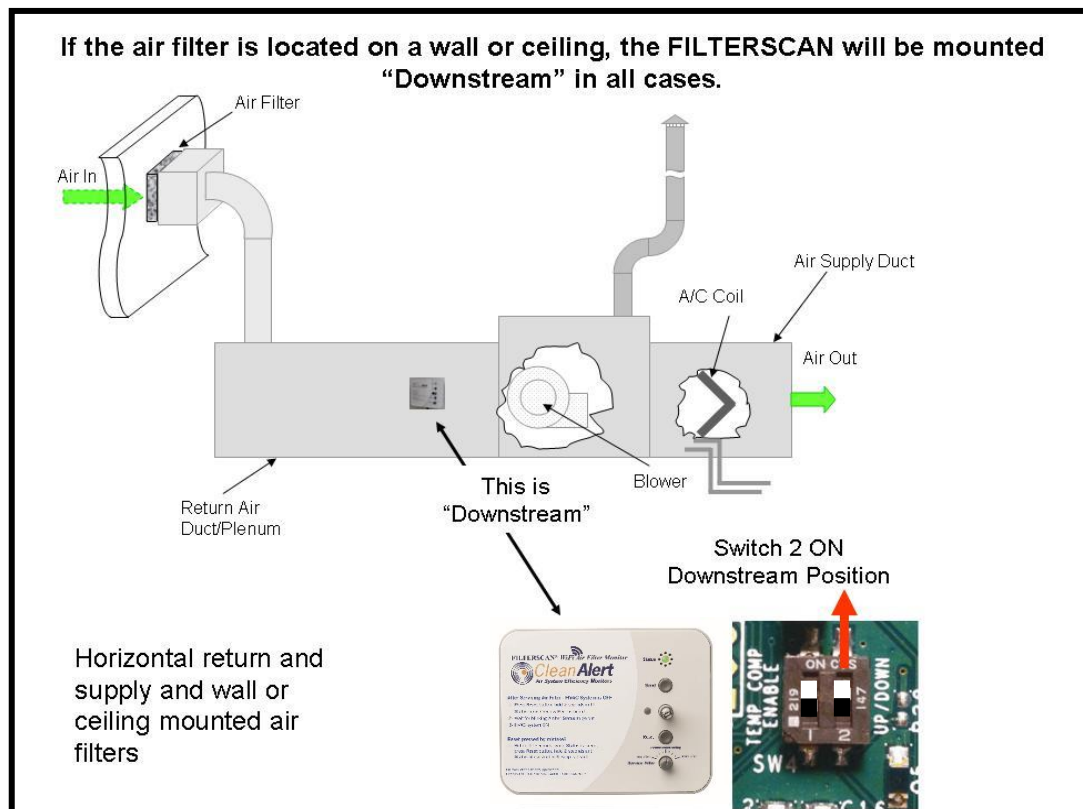


Figure 19: Installation on HVAC systems with wall or ceiling-mounted air filters

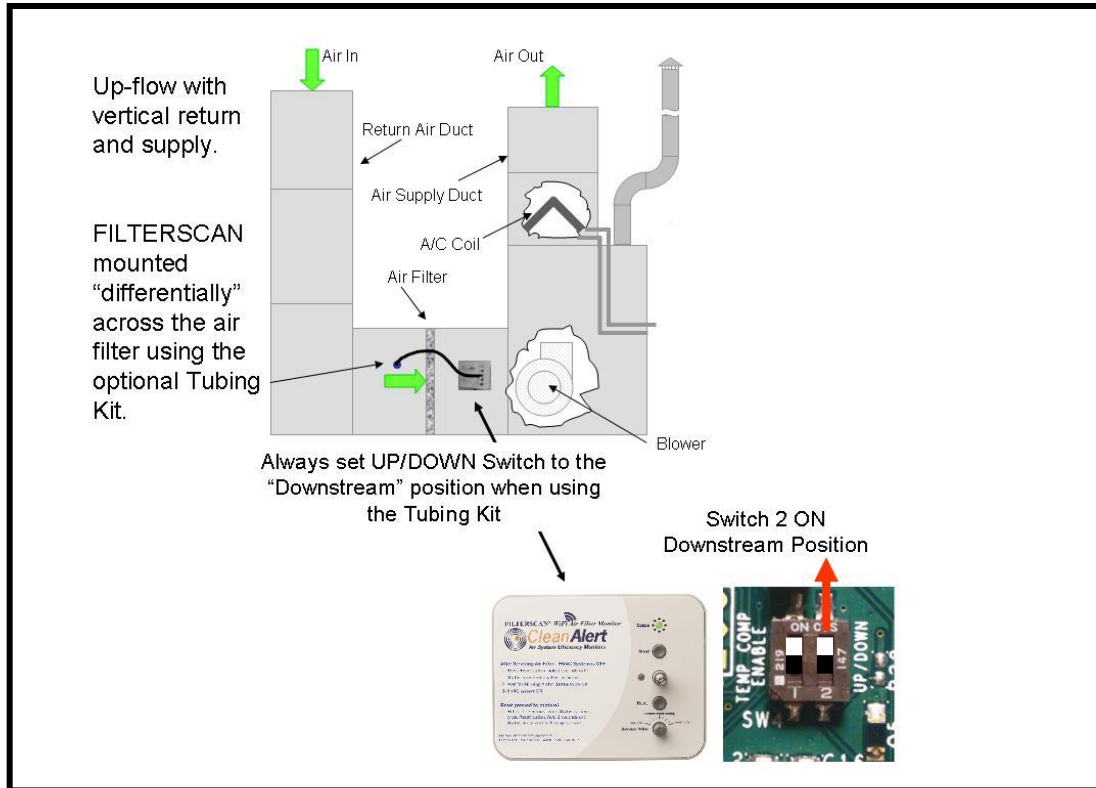


Figure 20: Installation of the optional CA-4DP Tubing Kit mounted differentially across the filter.

Optional Dry Contact Relay Output Operation

1. When connecting the relay output to an external building automation system (BAS) or alarm, it is recommended that the Common and Normally Closed contacts be used. This allows the external system or alarm to detect when the cabling is cut.
2. During a clog alarm, the relay will activate for one second, opening the Normally Closed contacts, and closing the Normally Open contacts.
3. Note: If the power is lost, there will be no relay indication of such power failure.

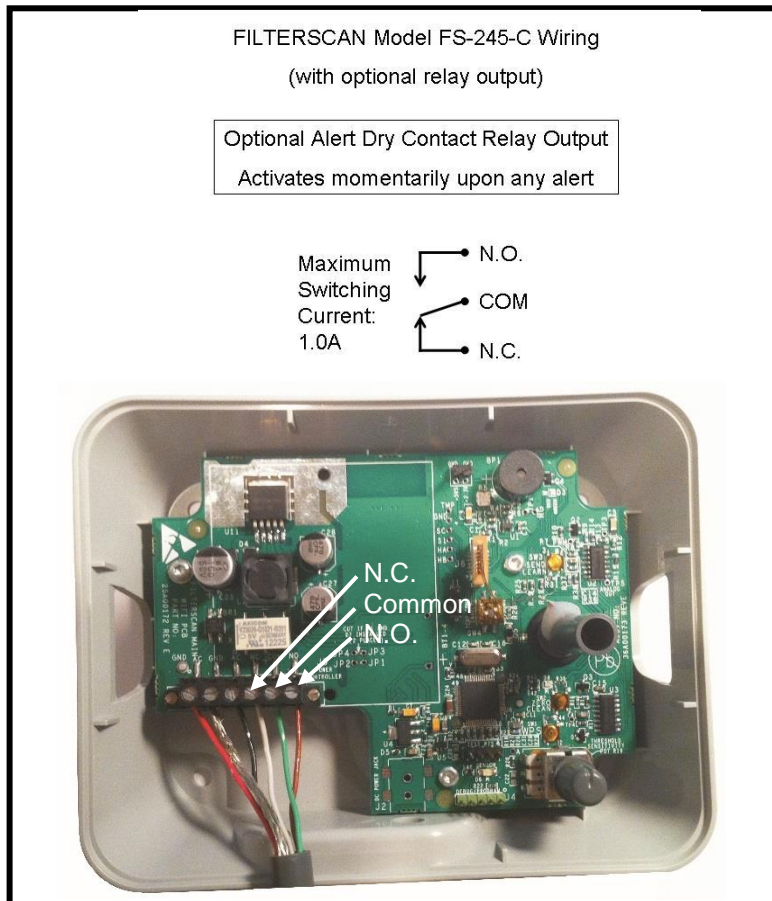


Figure 21: Model FS-245-C with Optional Relay Output

Disclaimer

While CleanAlert makes every effort to ensure the smooth operation of the **AirFilterSentry™ Notification Service** software, it makes no warranty as to its effectiveness for a particular purpose; and makes no warranty as to its availability, because it is hosted on a third party system over which CleanAlert has no control. CleanAlert will not be held accountable for any damage that may or may not result from the unavailability of this service.

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose and to adopt such precautions as may be advisable for the protection of property and of persons. In light of the foregoing, the warranty of CleanAlert, LLC on this product shall be exclusive and in lieu of any other warranties, including, without limitation, any warranty of fitness for a particular purpose or warranty of merchantability or any other warranties which may be claimed to arise by operation of law, custom, trade usage, or course of dealing between CleanAlert, LLC and the customer. In no event shall CleanAlert, LLC be liable, whether in contract or tort (including negligence) for damages in excess of the amount of money that CleanAlert, LLC charged for the product(s), or for any indirect, incidental, special or consequential damages of any kind, or loss of revenue or profits, or other financial loss arising out of or in connection with the ability or inability to use the product(s), to the full extent these damages may be disclaimed by law. The discussion herein of various applications is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any CleanAlert, LLC patents that may cover such applications. We recommend that each prospective user test his proposed application before use, using this data as a guide.

CleanAlert products are manufactured under one or more U.S. Patents which can be found at www.cleanalert.com/legal/patents. Specifications are subject to change without notice.
© 2012-2018 CleanAlert, LLC