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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 WiFi Business 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 WiFi Business Air Filter Monitor	17
Operation - FILTERSCAN WiFi Business Air Filter Monitor	18
System Monitoring	18
Alarm Modes	18
Cloaged 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	21
Frequently Asked Ouestions	21
Specifications	25
Warranty	25
WiFi	26
Transmitter	26
Remote Update	20
Revision History	_0 26
Annendiy	27
Clossary	27
Indicators	27
Local Alarm Indications	21 28
Various HVAC Configurations	20 20
Ontional Dry Contact Relay Output	∠ສ 20
Disclaimer	32 32
	52

Introduction

Congratulations on your purchase of the CleanAlert **FILTERSCAN**[®] *WiFi* **Business Air Filter Monitor**. The CleanAlert **FILTERSCAN** *WiFi* **Business 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 <u>www.cleanalertwifi.com</u> where you may register your **FILTERSCAN** *WiFi* **Business 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 Business 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* Business 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* **Business 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* **Business 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 soumis 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-BModèle: FS-245-BModel: FS-245-CModèle: FS-245-CContains IC Certification/Registration Number: #6514A-RN171Numéro de Certification / d'enregistrement les IC: #6514A-RN171

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 <u>www.cleanalertwifi.com</u> to provide warranty information and to create an AFS account to configure your notification preferences and messages.

- 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 multiple monitors in your AFS account, enter any one of the serial number in the first text box below.

SIGN U	P
	All fields are required
	Serial Number
	First Name
	Last Name
	Email <mark>(account name)</mark>
	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	V
Format for Notifications	V
Cell Phone Numbers for	Text Notifications
Pho	ne Help appears here
Phone1 (up to 3)	
Email Addresses for Ema	il Notifications
Ema	ail Help appears here
Email1 (up to 3)	
Text/Email Messages	
Text/Email	Message Help appears here
Clog Alert Text	Preview:
Battery Low Alert Text	Preview:
Malfunction Alert Text	Preview:
Allow automatic updates to	your FILTERSCAN software What is this?
Add FILTERSCAN WiF	i 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* **Business 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* **Business 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(s) 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 <u>Privacy Policy</u> for information about how we handle your personal information.		
ENTER CONTACT INFOR	RMATION *required field	
*First Name		
*Last Name		
Company		
*Email (account name)		
*Address 1		
Address 2		
*City		
Country		
State		
Province		
*Zip/Postal Code		
*Time Zone		
*Phone		
Submit		



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



Figure 7: AirFilterSentry User Home Page

- 9. Select "FILTERSCAN WiFi Units" from the Home Page, then select "Add FILTERSCAN WiFi".
- 10. Follow the procedure in Step 6 to add additional monitors.
- 11. 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".
- 12. From the drop-down, select Location and Device for the unit to edit.
- 13. Make the necessary changes and click on Update.
- 14. 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 Business Air Filter Monitor Installation

The CleanAlert **FILTERSCAN** *WiFi* **Business 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.

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

- 2. The **FILTERSCAN** *WiFi* **Business 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* **Business 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* **Business 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* **Business 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* **Business 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.



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* **Business Air Filter Monitor**.
- Locate the six terminals on the left-hand bottom corner of the printed circuit board illustrated in Figure10. 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)

- 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 Business 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* **Business 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 Business 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* **Business Air Filter Monitor** is now connected to your wireless router, and has initiated a connection process where the **FILTERSCAN** *WiFi* **Business 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 1WiFi 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,	Error Connecting to WiFi	Check to insure other devices (laptop or
pattern repeats 3 times.	network after wireless router configuration	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,	Server registration failed.	Insure that the correct serial number and
pattern repeats 3 times.	Serial number or MAC address does not exist in the AFS database.	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 WiFi	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!

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.

<u>Character</u>	<u>SSID /</u> <u>Network Name</u>	Password
space	Yes	Yes
!	Yes	Yes
"	Yes	Yes
#	Yes	No
\$	No	No
%	Yes	Yes
&	Yes	No
I	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
Ň	Yes	Yes
]	Yes	Yes
^	Yes	Yes
_	Yes	Yes
``	Yes	Yes
{	Yes	Yes
	Yes	Yes
}	Yes	Yes
~	Yes	Yes

Special Character Permissions in Network Name (SSID) & Password

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 Business 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, select Wi-Fi, 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.

Password:

FILTERSCAN Network Configuration	
MAC Addr: 00:05:55:53:35:40	
SSID: linksys (CH: 6; RSSI: -37dBm)	Join Netwo

Figure 14: FILTERSCAN WiFi Network Configuration Page

Join Network

Error: SSID Name cannot contain a \$ charac	cter.
	Close
Error: Password cannot contain a &, #, or \$ character.	

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.

192.168.1.1	C
FILTERSCAN® WiFi Network Configuration	
Your FILTERSCAN® WiFi will now connect to the selected network. Reconnect your device (e.g. PC, smartphone, etc) to your network. If the FILTERSCAN® WiFi is unable to connect to the selected network, the FILTERSCAN® WiFi network will be recreated.	

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

- Upon successful sign up, configuration, installation, power up, and Internet connection, the FILTERSCAN WiFi Business 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* **Business 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* **Business Air Filter Monitor** once, and **immediately release**, to send status to the cleanalertwifi.com server database.
 - c. Then, login to your AFS account at <u>www.cleanalertwifi.com</u> to view your monitor's status.
- **NOTE:** Your **FILTERSCAN** *WiFi* **Business 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* Business 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 Business Air Filter Monitor records the HVAC system's FAN OFF condition. When the blinking amber stops, this indicates proper operation.
 - 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.
- Wait at least one minute before turning your HVAC system ON The FILTERSCAN WiFi Business 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* **Business 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* **Business 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* **Business 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* **Business 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 <i>WiFi</i> Business 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 <i>WiFi</i> Business Air Filter Monitor goes back to sleep after several minutes of monitoring.
	NOTE: Should there be a power failure the FILTERSCAN <i>WiFi</i> Business 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 <i>WiFi</i> Business Air Filter Monitor will continue operation with no user action required. The same applies when replacing depleted batteries.
Alarm Modes	The FILTERSCAN <i>WiFi</i> Business 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 <i>the AirFilterSentry Notification service is required to enable this feature.</i>
	NOTE: The HVAC system blower fan must be running when the FILTERSCAN <i>WiFi</i> Business Air Filter Monitor attempts to check air filter condition. Since the FILTERSCAN <i>WiFi</i> Business 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 <i>WiFi</i> Business 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 <i>WiFi</i> Business 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 <i>WiFi</i> Business 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 <i>WiFi</i> 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 <i>WiFi</i> Business Air Filter Monitor , observing polarity, and replace the front cover.
	 When the FILTERSCAN WiFi Business 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 Business 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 Business 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, 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, or in the case of 15-24V AC/DC-powered models ("-C") contacting
Calibrating When Installing a New Air Filter	Whenever a new air filter is installed, the FILTERSCAN <i>WiFi</i> 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* Business 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, log into your AFS account, select Filter Status, then click on the "Reset this monitor" button. Your FILTERSCAN *WiFi* Business 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.
 - After approximately ten seconds, the STATUS LED will blink yellow for approximately 20 seconds while the FILTERSCAN *WiFi* Business Air Filter Monitor records the HVAC system's FAN OFF condition. When the blinking amber stops, this indicates proper operation.
 - 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 Business 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* **Business 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* **Business 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* **Business Air Filter Monitor** automatically adapts to the changes in HVAC blower speeds.

Software Updates

The **FILTERSCAN** *WiFi* **Business 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* **Business 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 <i>WiFi</i> Business Air Filter Monitor be mounted on the supply side of the HVAC blower? <i>No, only on the return side duct, either upstream or downstream of</i> <i>the air filter or differentially across the air filter.</i>
	Can I install the FILTERSCAN <i>WiFi</i> Business Air Filter Monitor on a multi-speed blower HVAC system? Yes.
	Can I install the FILTERSCAN <i>WiFi</i> Business Air Filter Monitor on a Variable Air Volume (VAV) HVAC system? As of the writing of this manual, the FILTERSCAN <i>WiFi</i> Business Air Filter Monitor <i>will operate with most VAV systems in production.</i> 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 <i>WiFi</i> Business 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 Business 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. <i>1. First, depress the</i> SEND button on the FILTERSCAN WiFi Business 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 Business 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 Business 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 to 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 Business 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 <i>WiFi</i> Business 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 <i>WiFi</i> Business Air Filter Monitor via the conduit? <i>Typically 24V AC/DC, although an input voltage as low as 15V DC is acceptable.</i>
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 <i>WiFi</i> Business 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 <i>the</i> FILTERSCAN <i>WiFi</i> Business Air Filter Monitor <i>will receive an email notification of the current owner's action.</i>
	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 <i>WiFi</i> Business 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 Business Air Filter Monitor. Will the

 AirFilterSentry Notification Service allow access of all Monitors within

 one account?

 Yes, you can sign-up unlimited monitors in one AFS Business

 account. Contact Customer service at 888-414-FLOW (3569) if you

would like more information.

Specifications

Differential Pressure Range Clog Filter Trigger Point	Near zero to 4.0 in w.c. 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"
<i>WiFi</i> 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* **Business 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* **Business Air Filter Monitor** has been assigned a unique MAC address at the time of manufacture.

Remote Update

The **FILTERSCAN** *WiFi* **Business 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* **Business 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* **Business 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.

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 Business
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

Revision History

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 <i>WiFi</i> Business 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 <i>WiFi</i> Business Air Filter Monitor .
Ind	licators	
	Green STATUS LED	The blinking Green STATUS LED at the FILTERSCAN <i>WiFi</i> Business Air Filter Monitor indicates normal operation.
	Yellow STATUS LED	The blinking Yellow STATUS LED at the FILTERSCAN <i>WiFi</i> Business Air Filter Monitor indicates a process is occurring and can also indicate

Red **STATUS** LED....... The Red **STATUS** LED at the **FILTERSCAN** *WiFi* **Business Air Filter Monitor** is an alarm indicator which blinks whenever an alarm condition occurs.

a low battery condition at the Monitor or Receiver.

Beeper..... The audible beeper at the **FILTERSCAN** *WiFi* **Business Air Filter Monitor** is an alarm indicator which beeps whenever certain alarm conditions occur.

Local 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	Replace Filter and
	ten minutes. Beeper sounds with LED flash,	Recalibrate
	if ambient light is present.	
Low Battery	STATUS LED flashes yellow every minute.	Replace Batteries
Sensor Failure	STATUS LED continuously on red for 5	Contact CleanAlert
	seconds, every 10 minutes. Beeper sounds	Customer Service at 888-
	with LED, if ambient light is present.	414-3569

Monitor/Transmitter Alarm Indications

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.

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