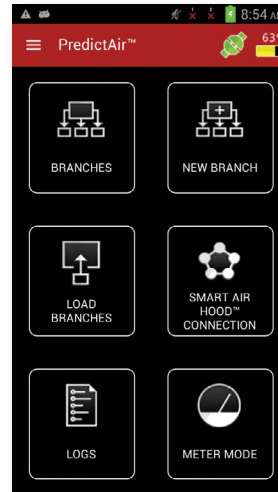# Series SAH SMART Air Hood™ Balancing Instrument - PredictAir™ Application Software

Specifications - Installation and Operating Instructions

The **SERIES SAH** SMART Air Hood™ Balancing Instrument is the most accurate and easy to operate air flow hood on the market. By using the included hood stand and wireless communications to the handheld, a single operator can balance a branch in less time than traditional balancing teams. Besides being lighter than most traditional capture hoods, the ergonomic design makes the Series SAH easy to maneuver, with less physical stress. The rugged polypropylene base hood features patented Quad Flow Design Technology for controlling air flow and minimizing back pressure, which yields superior measurement accuracy. The Wi-Fi direct communication gives reliable communication with a distance of up to 200 yards between the hood and the handheld test instrument. The SMART Air Hood™ Balancing Instrument includes the PredictAir™ Application Software which reduces the number of steps in the air flow balancing process using Predictive Balancing's Express Balance mode. Predictive Balancing is a method of predicting the optimal flow set point for each register and the order in which they should be adjusted.

Please see Bulletin TE-SAH for general installation instructions.

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DWYER INSTRUMENTS, INC.

P.O. BOX 373 • MICHIGAN CITY, INDIANA 46360, U.S.A.

Phone: 219/879-8000   **www.dwyer-inst.com**

**Fax: 219/872-9057**   **e-mail: info@dwyermail.com**

I. SETUP

To be able to update the PredictAir™ Application Software, a Google account must be created so that the application can be updated from Google Play™ store. To properly connect to Google Play™ store a connection to a Wi-Fi network must be established.

CONNECTING TO A WI-FI NETWORK
First, press the application icon on the home screen (should look similar to the below image).
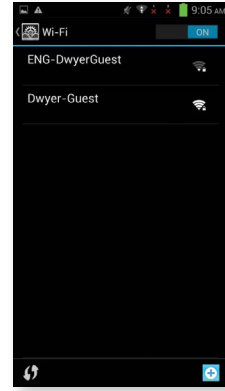

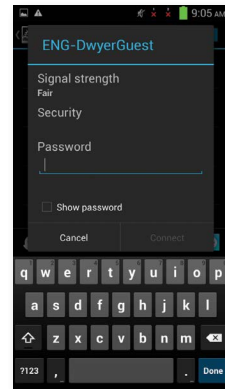Then find the settings icon and click on it.
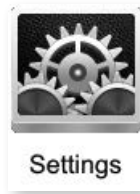
Next, press Wi-Fi to enter into the Wi-Fi settings.
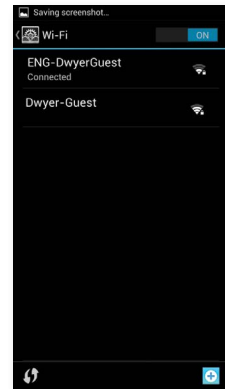

Next, choose a local Wi-Fi network to connect to.

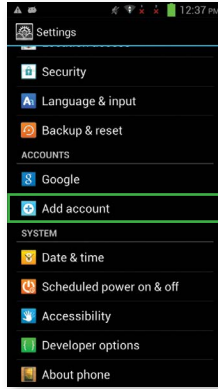Enter in the password to connect to the Wi-Fi access point.

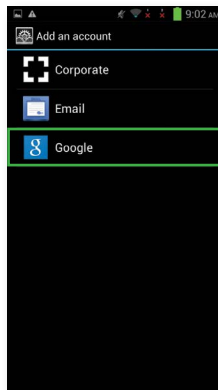The handheld will now be connected to the Wi-Fi network.

SETTING UP A GOOGLE ACCOUNT
First, go back to main Settings screen and choose the "Add account" option.
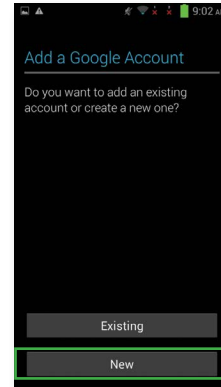

Select Google.

If you have a Google account select "Existing" and enter in your account information to register your Google account to the device.
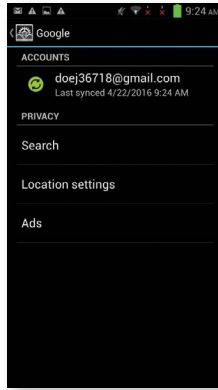If you do not have a Google account follow the guide below to add one.

First, press "New" and follow the on screen prompts.

When the account is created you might need to do an authentication check to activate the account. The notice will be in the pull down menu on the device. Press the notification and follow the instructions to activate the account.
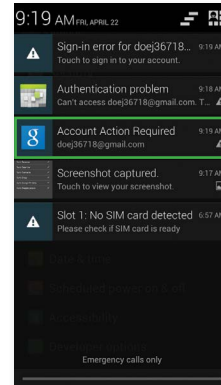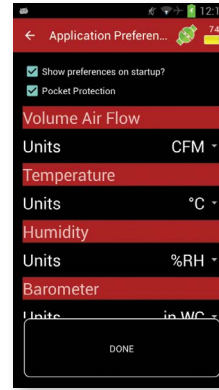
If the account was created correctly the following screen will show your new account.

UPDATING THE PREDICTAIR™ APPLICATION SOFTWARE
Now that a Wi-Fi connection is established and a Google account is tied to the handheld instrument, the Google Play™ store can now be accessed.
Open Google Play™ store from the applications.

Play Store

Search for PredictAir™ Application Software and press it.

Press the "UPDATE" button to update the application.

The PredictAir™ Application Software should now be up to date.

APPLICATION PREFERENCES
When the application is first opened, the following screen will be shown.

Touch to edit the default units of these fields
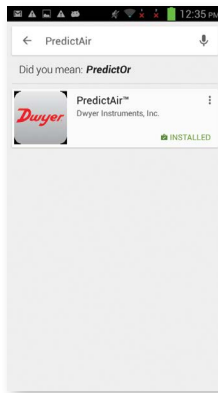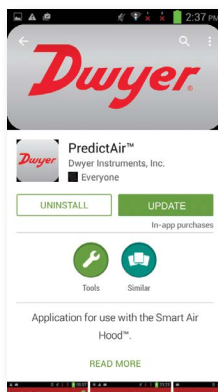
**Touch to save the preferences and go to the app's main page**

The "Show preferences on startup?" checkbox gives the choice for this screen to continue being shown whenever the application is opened. If it's not checked, then the app will open directly to the main screen.

The "Pocket Protection" option prevents unwanted key presses. When activated, if an object covers the screen then the screen will go black and any buttons become inactive. When the object is pulled away from the screen, then the screen will return back to its previous state. This should protect the work from being interrupted when the device is placed in a pocket or other carrying method.

The Preferences can otherwise be located in the main menu by sliding a finger from the left edge of the screen towards the right, pressing the menu button, or pressing the 3 lines at the top of the page and selecting "App Preferences".
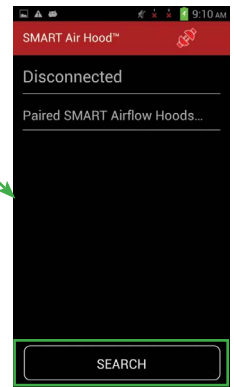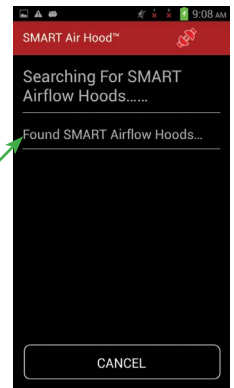
CONNECTING TO THE HOOD
Once the handheld instrument is on, open the PredictAir™ Application Software. From the main application screen, press the **SMART AIR HOOD™ CONNECTION** button to connect to the air flow hood.
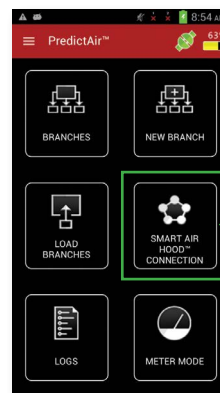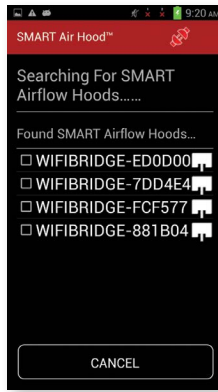

**If no paired hoods found**

If paired hoods found

If no paired hoods are found the app will start searching for a hood to allow connection, otherwise press the SEARCH button to search for hoods to allow pairing.

As the app discovers hoods, they will be added to the list under "Found SMART Airflow Hoods".
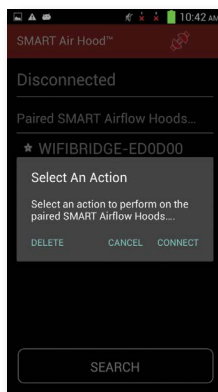

Select the hood that is to be paired. **Note:** More than one line can be selected to pair multiple hoods at the same time.
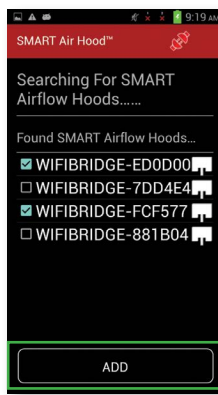

Once the desired hood(s) are selected, press the **ADD** button.

To connect to the desired hood press the hood's name in the Paired SMART Airflow Hoods list. This will bring up a dialog box that allows for the choice to connect, delete, or cancel the action.


Press "CONNECT" to start the process of establishing the link between the handheld device and the hood. This will bring up a dialog box while the process of establishing the connection is performed. Pressing the cancel or back button will return to the paired screen without establishing a connection.
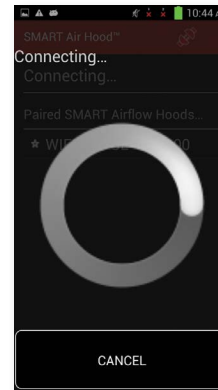
Once the connection is established, the dialog will automatically close. This will return the application back to the paired devices screen with a green icon and white star (default hood) indicating the hood has been connected to the handheld.
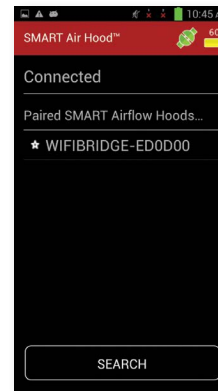
To disconnect from the current hood press on the white star. The Disconnect dialog comes up, which allows for the hood to be disconnected. If "No" is selected, the dialog will be closed without any other action being taken. If "Yes" is selected, the hood will be disconnected, but still paired.
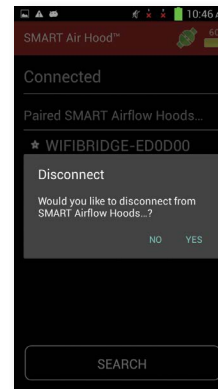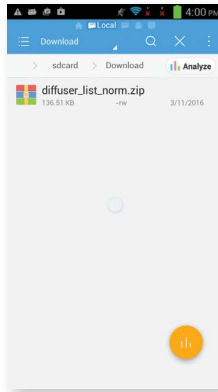

If a different hood is pressed, the Connection dialog box will appear. If "Connect" is selected, the first hood is disconnected and the second hood is connected. If "Delete" is selected, that hood will be removed from the Paired SMART Airflow Hoods list.

IMPORTING A DIFFUSER
Diffusers can be imported to the application by the following instructions.

Load the diffuser into a directory on the device. This has to be a zipped file obtained from the Dwyer Instruments, Inc. website.
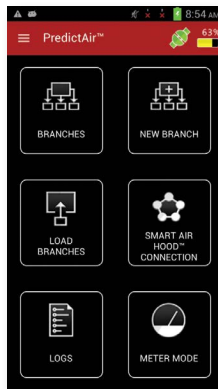

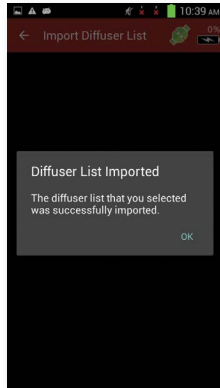Open the PredictAir™ Application Software.

Slide a finger from the left edge of the screen towards the right, press the menu button, or press the 3 lines at the top of the page to open the main menu's options, and select "Import Diffuser List".

Go to the directory where the diffuser list was put on the handheld instrument.

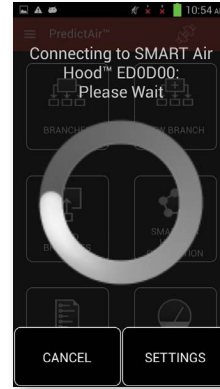Select the diffuser list to import.
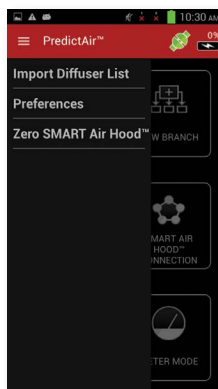
The app will import the diffuser list.
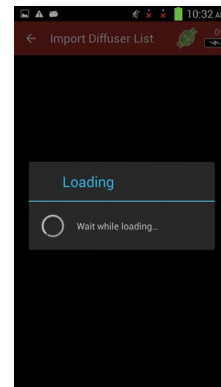
If the diffuser list was set up correctly, and the version is current, then the app will give the below message. If there isn't a diffuser list loaded, then the app will generate a diffuser list.
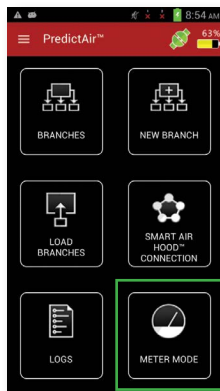

II. METER MODE

To enter Meter Mode in the app, press the **METER MODE** button from the home screen.

If a hood has not previously been connected or by pressing "Settings", then see the previous Connecting The Hood section.

Once a connection has been established, the Meter Mode page will be displayed.

ZEROING THE HOOD
In order for the hood to be zeroed for taking readings on a side wall, place the top of the hood against a wall as shown below. The hood should be away from any sources of air flow like registers and returns. For the hood to be zeroed for taking overhead readings, place the hood on the floor with the top facing up as show below.
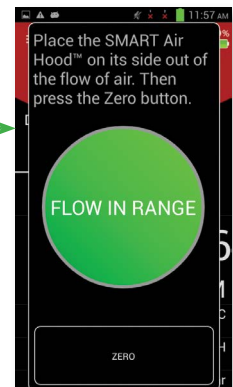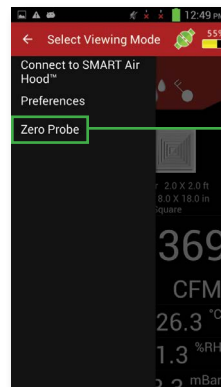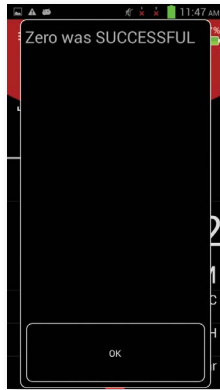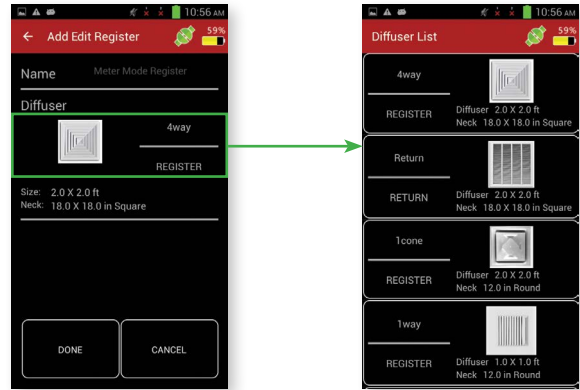

Overhead

Side Wall

In order to zero the hood, press the three bars at the top of the screen or slide from the left or press the menu button. Press the Zero Probe menu selection to zero the hood.

Press the **ZERO** button. This will begin the zeroing process. When complete, it will show the following screen.

If there is too much air flow for the hood to be zeroed, then the following screen will be displayed. Notice that the zero button is disabled if there is too much air flow.

SELECTING THE DIFFUSER
This screen displays the various readings from the sensors, along with a picture of the diffuser of the register being measured. By pressing the diffuser, the "Add Edit Register" will be brought up, which allows for the diffuser being measured to be changed.

Press on the diffuser to bring up the list of diffusers and select the diffuser that will be used.
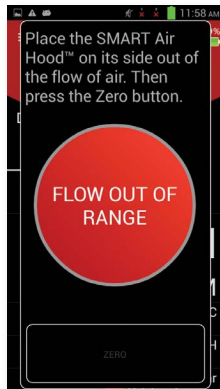
Manual K-Factor
In the case that the diffuser being used is not in the downloadable library, but the K-factor of the diffuser is known, the K-factor can be manually entered into the application.

While in meter mode, press on the diffuser to open the Diffuser list.

Find "Manual Register" in the list and press it to open the next screen.

Define it as a Register for supply flow or Return for return flow.
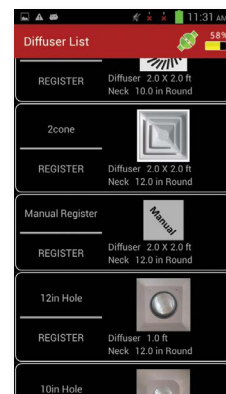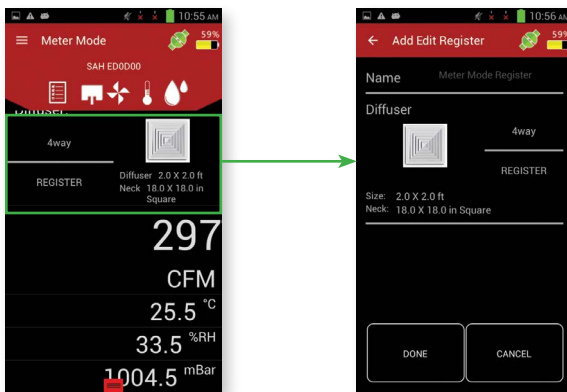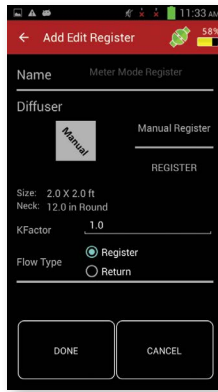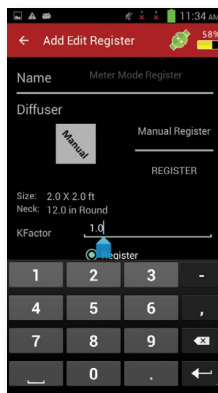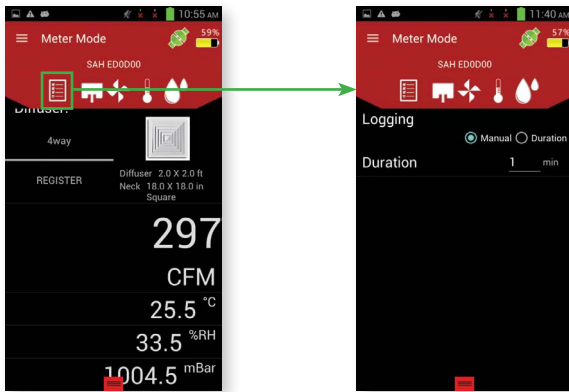

Press on the K-Factor field to enter the K-factor of the diffuser, then press "Done" to return to the Meter Mode screen.

PREFERENCES
Logging Preferences
To view the logging subsection of the Preferences, press the page icon.

Manual Mode indicates that points will only be logged when the user presses the **"LOG"** button in Meter Mode. Duration Mode allows for points to be logged every time a value is updated for the next X minutes after the **"LOG"** button in Meter Mode is pressed.

"Duration" is the number of minutes that data will be logged.

Press the page icon again to return to Meter Mode.
Note: Pressing the "Back" will exit Meter Mode.

Hood Information Preferences
To view the hood information, press the hood icon.
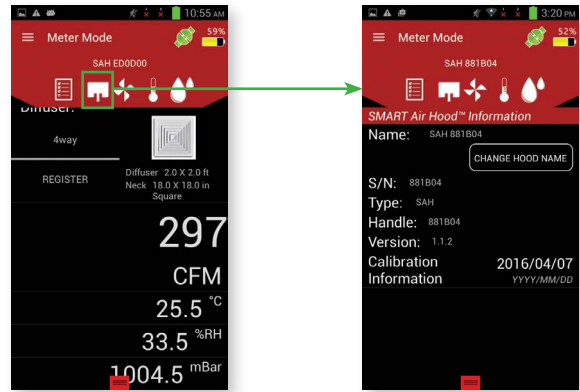
Press the hood icon to return to Meter Mode.

Volume Airflow Preferences
To view the volume airflow information, press the fan icon.

Touch to select actual or standard flow

Touch to change units

Temperature Preferences
To view the temperature information, press the thermometer icon.

Touch to change units

9
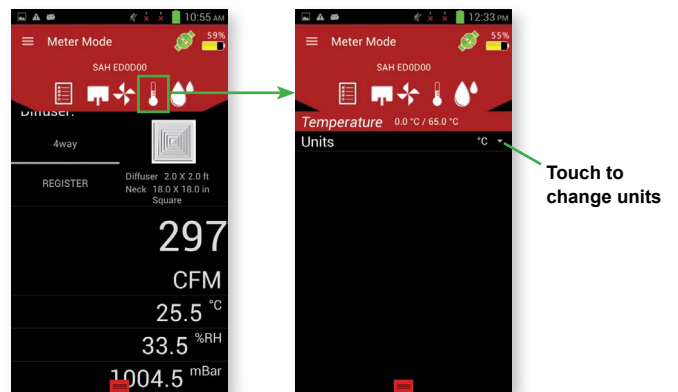
Humidity Preferences

To view the humidity information, press the drops icon.

Touch to change unit type

Touch to change units

Barometer Preferences

To view the barometer information, press the barometer icon.

Touch to make primary sensor
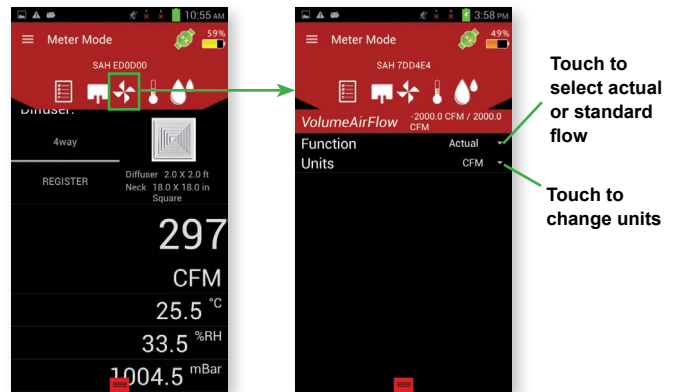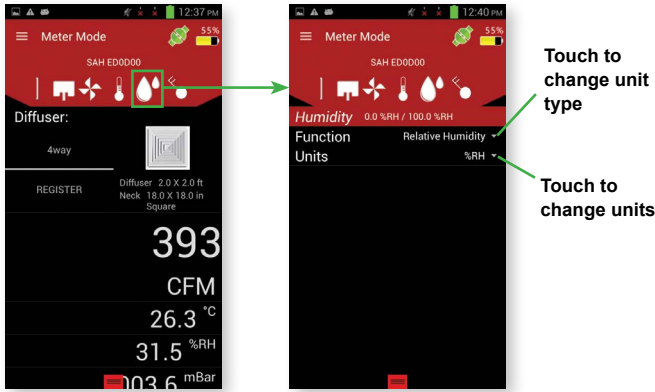
Touch to change units

Overall Preferences

Sliding a finger from the left edge of the screen towards the right, pressing the menu button, or pressing the 3 lines at the top of the page will open the Menu.

Pressing on "Preferences" will open up the Preferences screen, which contains all of the preferences for the SMART Air Hood™ Balancing Instrument. Press either the back button or the arrow at the top to go back to the Meter Mode main screen.
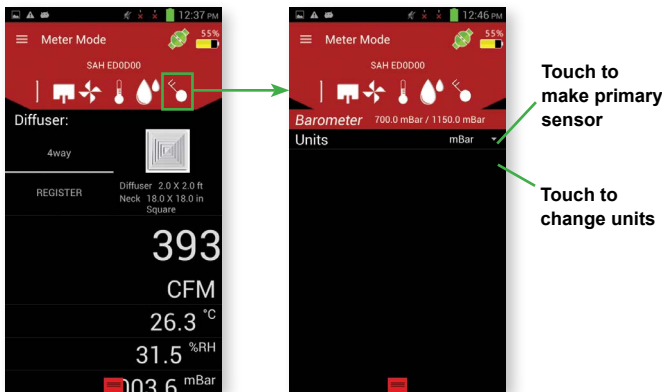

LOGGING

Log files can be generated from the Meter Mode screen. To start logging, slide up the bottom tab to display the logging tile.

Press the **LOG** button to start a new log. If the logging is manual (set in Preferences), then only a single point will be logged, otherwise it will log points for the duration stated in Preferences. The "Points Logged" will increase, indicating how many data points exist in the log.

The **SAVE LOG** button will bring up a dialog with options to continue the current logging session or to save and close the current log.

If the **Save Log** button is pressed, the dialog box below will appear.

Name and file path of the log is displayed in text

Touch to close the dialog and return to Meter Mode

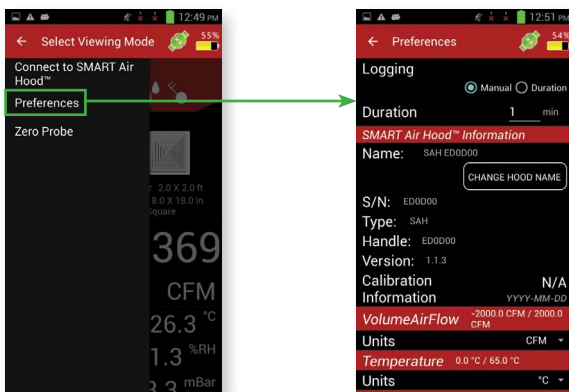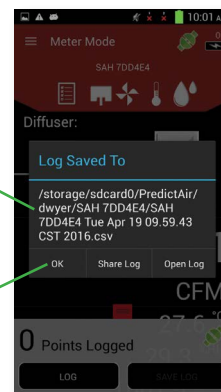Pressing the "Open Log" button will display the following screen.
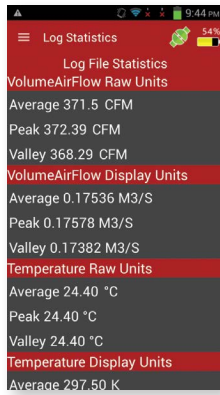
This screen displays all the sensors raw data and display data. The raw data is the data created using the default units. The display data is the data after converting the raw data into the selected engineering units. Additional options to interact with the log data are at the bottom of the list of sensors.
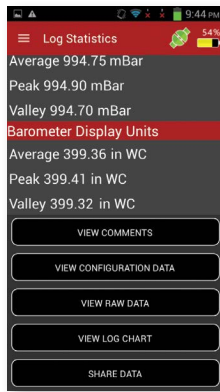
The **VIEW COMMENTS** button will open a text area showing any comments, along with a button that allows for the comments to be edited.
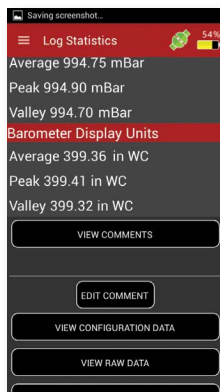
The **VIEW CONFIGURATION DATA** button will switch to a screen that displays the hood information. This provides the hood's version information, name, type, serial number, and all the sensor's information.


The **VIEW RAW DATA** button will open a new screen that is horizontally scrollable.
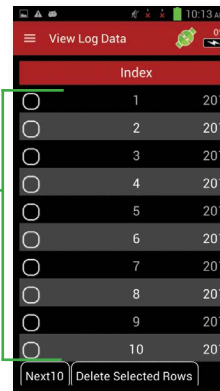
Touch to select and unselect rows

The **VIEW LOG CHART** button will open a chart of the logged points.
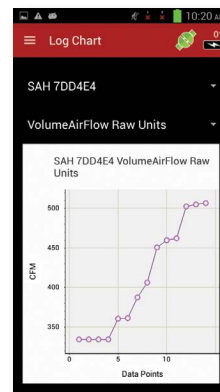
The chart area can be zoomed in and out by using two fingers. Double press will return chart area to default zoom.

Press on the drop down menu to change which sensor is being displayed in the chart.

The **SHARE DATA** button will bring up the handheld instrument's default selection to share data. If no defaults have been chosen, then a dialog will be brought up with a set of Android® applications that can handle the resulting activity. (In this case, a way to share the file by email, saving it to a disk, etc.)

III. PREDICTIVE BALANCING

BRANCHES
To access the Branches menu, press the **BRANCHES** button from the main screen.

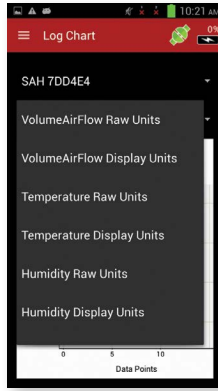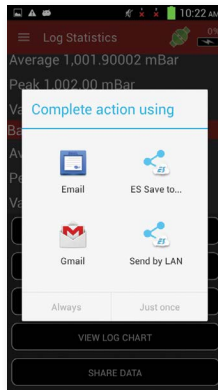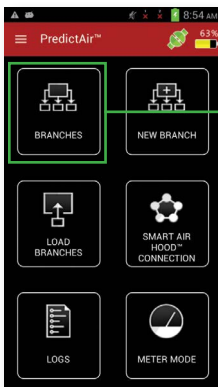Next, press the desired branch. This will bring up a dialog with the available actions for that branch. If the branch has been previously started, then the following menu will be shown.
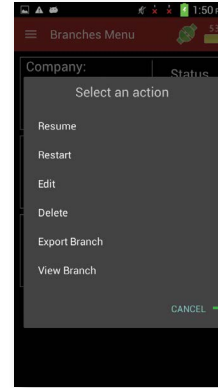
Touch to close window without performing any actions

"Resume" will continue the balancing process at whatever step it was at previously.

"Restart" will start the balancing process from the very beginning where registers are added/edited. This will still retain any registers previously added.

"Edit" will bring up the "Add Edit Branch" screen.
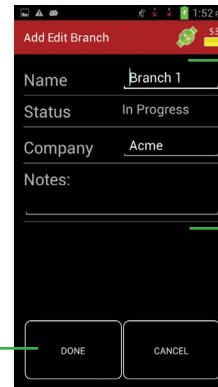
Touch to edit any of these fields except the status field (the app controls this field)

Touch to save any changes made

"Delete" will bring up a dialog asking to confirm the deletion.
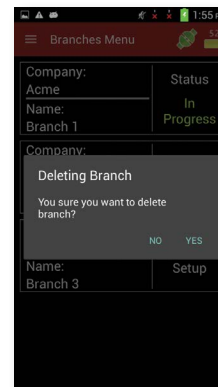
"Export Branch" will bring up a file dialog.
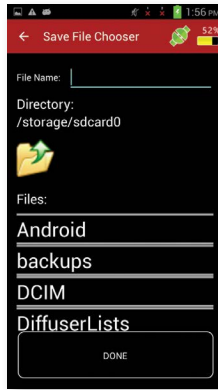
Press the "File Name" field to enter the file name associated with this branch. This field can't be blank or the below error message will appear. The folder icon with the arrow will navigate up a folder. Folder names do not have extensions and file names will have extensions.
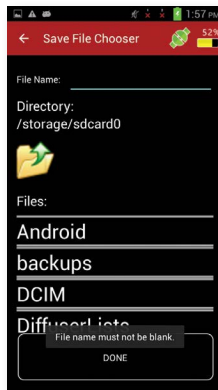
"View Branch" will open a dialog box containing the information for the branch in a non-editable form.
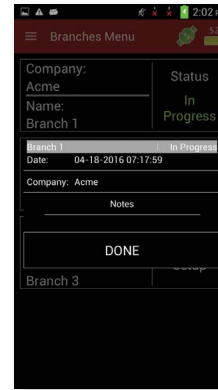
Branches Menu
Sliding a finger from the left edge of the screen towards the right, pressing the menu button, or pressing the 3 lines at the top of the page will open the Branches Menu.
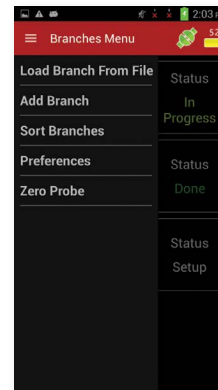
"Load Branch From File" will allow you to select a file to choose which branch to load. **Note:** This filters the file names to only show directories or files with the extension ".brc", indicating it is a branch file.
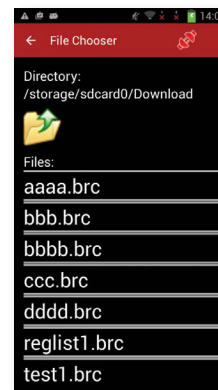
Pressing the branch name loads that branch and adds it to the list of branches. Once complete, the app will return to the Branches main page with the new branch added to the list.

"Add Branch" will bring up the Add Edit Branch screen allowing addition of another branch.

"Sort Branches" will bring up a dialog that contains the options to sort branches by different methods.
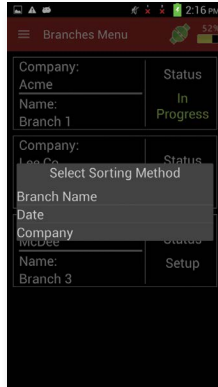
Note that pressing on a branch that has never been started will open the same dialog as editing an existing branch, except for that "Resume" and "Restart" are replaced with "Start". The "Start" option will start the balancing option from the very beginning.
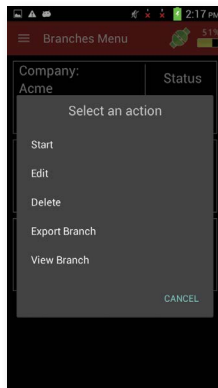
Pressing "Start", "Restart", or if the process was paused while still loading registers, the Load Registers screen will be brought up.

ADD REGISTERS
Since this is a new process, no registers have been loaded. Open the menu by sliding a finger from the left edge of the screen towards the right, pressing the menu button, or pressing the 3 lines at the top of the page. This shows options to modify the registers used in the balancing process for this branch.
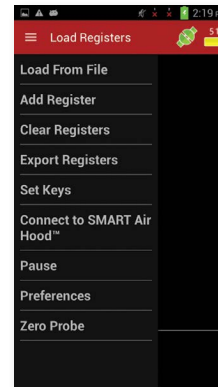

"Load From File" will allow a ".csv" file to be chosen. Note that some of the files might not be a register file, which displays an error if selected.
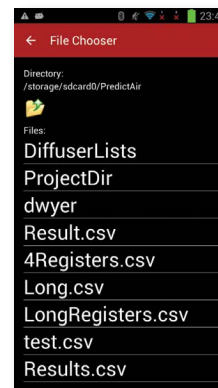
"Add Register" will bring up the Add Edit Register screen with nothing filled in except for the default diffuser. As in Meter Mode, if the desired diffuser is not shown, press the manual diffuser to create a diffuser with a known K-Factor.

Touch to change diffuser
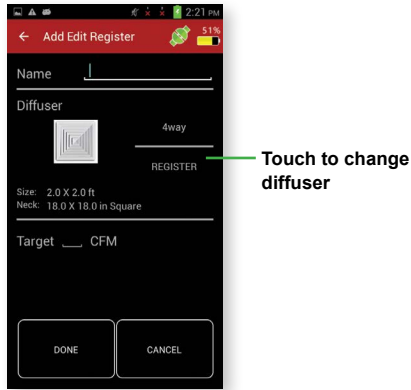
Pressing either the Name or Target field will bring up a keyboard allowing values to be entered. Note that the register name must be unique. If a register name is entered that is already in the list, the following dialog will be shown.

Touch to go back and enter a unique register name
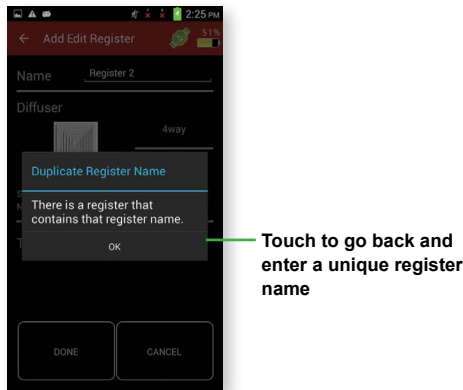
Both the name and the target fields must be filled in to create a register.

"Clear Registers" will erase all the registers in the list for the selected branch.

"Export Registers" will allow the registers to be saved to the handheld instrument. Note that the same dialog will come up asking to overwrite the file if a name is chosen that is already in use.

"Set Keys" will bring up a dialog that allows the selection of which registers are candidates to be the key (checked registers can be the key and unchecked cannot be the key). At least one register must be selected.

Touch to check and uncheck registers

Touch to close the dialog and set which registers can be the key
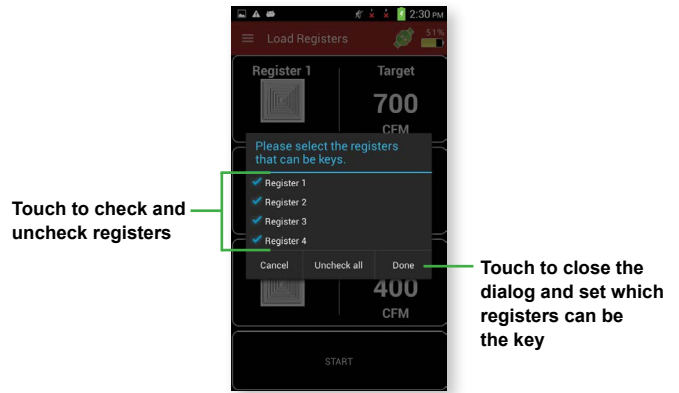
"Pause" will bring up the Pause dialog box along with pressing the Back button.

Touch to save the Register's information and return to the Branches screen

Touch to start the balancing process
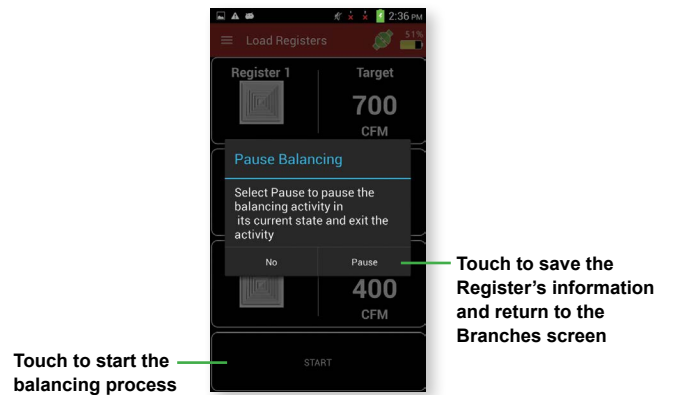
BALANCING PROCEDURE
The **START** button will start the balancing process. The START button will only be enabled if there are two or more registers in the register list.

The first step of the balancing procedure is to take an initial sweep of all registers within the selected branch with all dampers open.
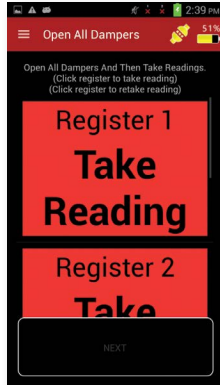
Red indicates that a reading still needs to be taken from the register. After selecting the register to measure, its button will turn from red to white, indicating that it is the active register.
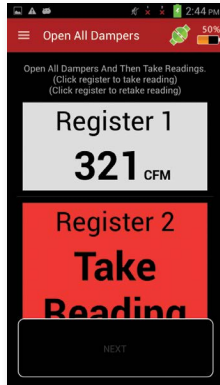
Press the register button again to store the reading, at which point it will change from white to green, indicating that a value has been stored for that register.
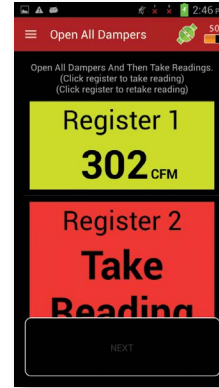
Repeat this procedure until all of the registers have been measured. Pressing on a register again allows for a retaking of that register if needed.

If the slide out menu is opened, the following choices will be shown.
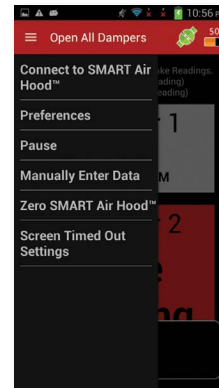
"Screen Timed Out Settings" allows the hibernate mode to be turned on. If the option is turned on, then the current screen will hibernate after timing out based on the handheld instrument's hibernate time in the Settings->Display->Sleep setting. If the option is turned off, then the device will stay awake and not go into hibernation. This is also available on the Initial Reading, Balancing, and Final Reading screens.
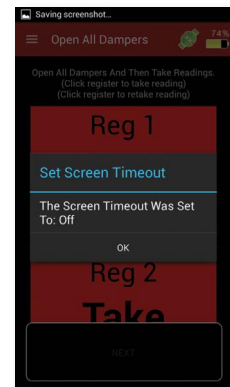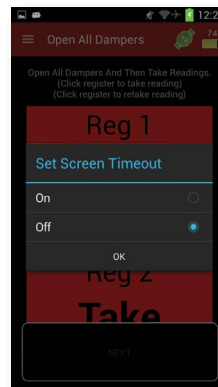
To enter data for a register that cannot be measured by the hood use the "Manually Enter Data" in the slide out menu. A register needs to be selected to enter data manually.

If a register is selected and "Manually Enter Data" is pressed, then a dialog will appear that allows for a value to be entered for the register.

Touch to close the dialog and set the register's value

Once all of the registers have been measured, the **NEXT** button at the bottom will become enabled. Press and hold that button until the balance method selection screen appears.

Select a balancing method.

Pressing on the **EXPRESS** button starts the Express balancing method, which starts with the Place the Smart Hood dialog box. As shown in the below example, the app will direct you to the register to measure:

Press and hold the **OK** button to bring up the dialog box asking to confirm that the hood is correctly placed.

Touch to close the dialog without storing the reading

Touch to close the dialog and take a pre-adjust reading

If the **YES** button on the hood placement confirmation dialog was pressed then the app will bring up the Adjust to Target screen.

"Manual Data" will bring up the Manual Data screen similar to the initial sweep manual entry dialog. After the manual data is entered, another dialog will appear. This manual entry dialog asks for the air flow of the register after adjusting (if it can be adjusted). The dialog includes the target air flow that the register needs to reach to balance the system.

Touch to enter as the adjusted value for that register

If the **CANCEL** button is pressed, then a Pause Balancing screen will be brought up. Pressing the **PAUSE** button in the pause dialog will store the current location and data within the selected balancing method and return back to the Branches screen.

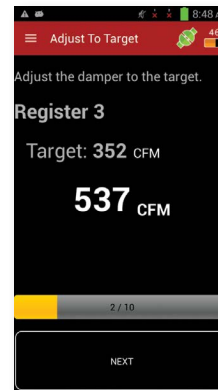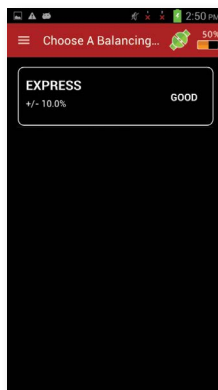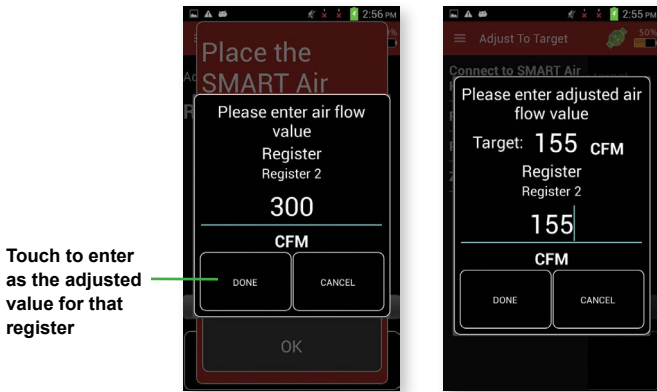While in this screen, the damper needs to be adjusted to match the target. Press and hold the **NEXT** button to bring up the next screen which will guide you to the next register to measure and adjust. Once all registers except the key register are adjusted the app will require a post reading from all the registers. The app will guide you through the post reading process.

The last register measured will be the key register after which the adjust system (shown below) will come up requesting to adjust the branch's flow source to the given target.

Press and hold to go to the Final Reading screen
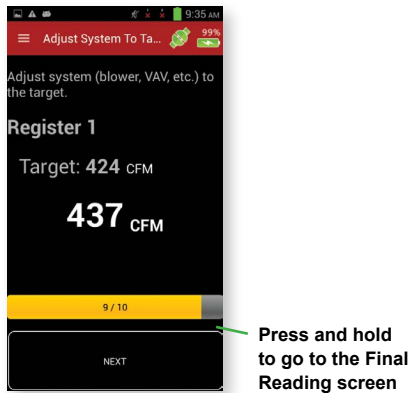
The options and controls of the Final Reading screen are the same as in the Initial Readings screen. This screen is to gather readings to calculate the error ratio of the balancing process which is displayed on the next screen.
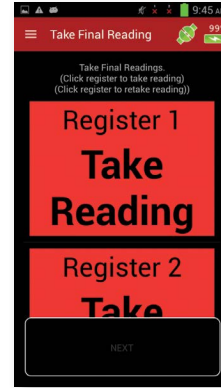
Once all of the registers are measured, press and hold the **NEXT** button, to bring up the Final Results screen. This screen displays how accurate the balancing method was.

Key Register
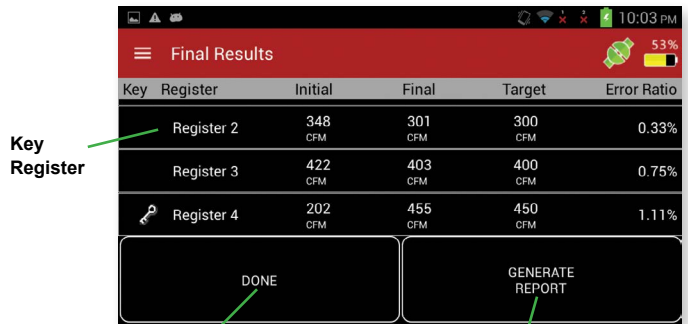
Press and hold to close the display and return to the Branches screen

Press and hold to save the results. It also provides a means to share the results

Final Results Menu
Sliding a finger from the left edge of the screen towards the right, pressing the menu button, or pressing the 3 lines at the top of the page will open the Final Results Menu.
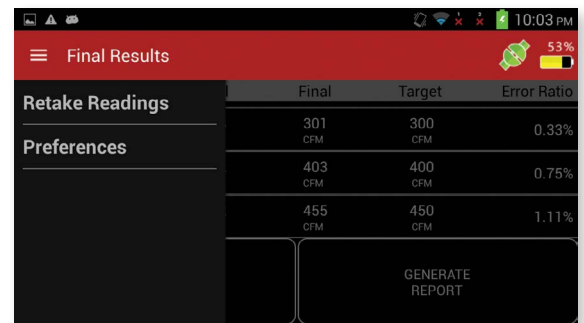
"Retake Readings" will return to the Final Readings screen so that one or more of the register readings can be retaken.

FCC/INDUSTRY CANADA NOTICE

NOTICE 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.

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 equipment and receiver
• Connect the equipment to 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.

NOTICE 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 harmful interference;
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

CAUTION Pursuant to FCC 15.21 of the FCC rules, changes or modifications not expressly approved by Dwyer Instruments, Inc. may void the user's authority to operate the equipment.

RF NOTICE

NOTICE This product complies with FCC OED Bulletin 65 and Industry Canada's RSS-102 radiation exposure limits set forth for an uncontrolled environment.

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

⚠ CAUTION The antenna used for this transmitter must maintain a separation of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

AVIS Cet appareil est conforme á Industrie Canada une license standard RSS exonérés (s). Son fonctionnement est soumis aux deux conditions suivantes:
1. Cet appareil ne doit pas provoquer d'interférences,
2. Cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant provoquer un fonctionnement indésirable de l'appareil.

AVIS Ce produit est conforme aux limites d'expositions aux rayonnements définies pour un environnement non contrôlé du Bulletin 65 FCC OET et RSS-102 Industry Canada.

DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46360, U.S.A.

Phone: 219/879-8000   **www.dwyer-inst.com**
Fax: 219/872-9057   **e-mail: info@dwyermail.com**