

Installation Manual
SensorLinx™ Heat Meter Installation Guide
Version 2.0.2



WFS-0020

WFS-0030

WFS-0070

WFS-0130

WFS-0400

HBX Control Systems Inc.

TABLE OF CONTENTS

Introduction	Index
Safety symbols and Warnings	Index
Receipt and Inspection	1
Storage	1
Nameplate Information	1
Technical Data and Information	2 - 5
Description and Main Parts	2
Technical Data and Dimensions	3
Flow Sensor Technical Specifications	4
Pressure Sensor Technical Specifications	5
Installation Guide	6-8
Device Wiring	6-8
Installation	9-10
ThermoLinx App Setup	11-13
Connecting to a Network (Android)	11
Connecting to a Network (iOS)	12-13
Adding Sensors to the ThermoLinx App	14
Navigating the ThermoLinx App	15
Local Connection	16
Limited Warranty	17

INTRODUCTION

This manual will help with the installation, parameter setting, trouble shooting and general maintenance requirements for the Controller. To guarantee the safe and reliable operation of this Control, you must first read this manual in detail and take particular note to any and all warnings or caution directives prior to connecting to AC power.

Only suitably qualified individuals with formal training in electrical and HVAC controls should attempt the installation of this equipment. Incorrect wiring and installation will affect the warranty provided with this unit. Wiring must be completed in accordance with the codes and practices applicable to the jurisdiction for the actual installation.

The HBX Sensorlinx™ Metering System is a microprocessor based controller and as such is not to be regarded as a safety (limit) control. Please consult and install the heating or cooling appliance in accordance with the manufacturer's recommendations.

SAFETY SYMBOLS AND WARNINGS



EXTREME HAZARD

This action poses a serious threat that could result in personal injury or death, as well as permanent damage to the equipment. Proceed with caution.




MODERATE HAZARD

This action may cause personal injury or have adverse effects on the installation process if handled incorrectly.



DISCONNECT POWER SOURCE

The presence of low voltage (24VAC) or high voltage (120VAC) could result in personal injury or permanent damage to components or equipment. Point of Interest - This point clarifies pertinent information, or brings your attention to an action that may have adverse effects on the installation process.

 **WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

RECEIPT & INSPECTION

After receiving, inspect the unit for any possible physical damage that may have occurred during transportation. After unpacking the unit make sure the box contains:

- 1 x WFS-0100 (Temperature & Flow Sensor)
- 1 x WPS-0100 (Temperature & Pressure Sensor)
- 4 x EPDM O-rings
- 2 x Dual unions, tailpieces - NPT, sweat, press
- 2 x Flow pipe and tube with connection fittings
- Instruction Manual



Make sure the part number on the unit corresponds to the part number on the original box

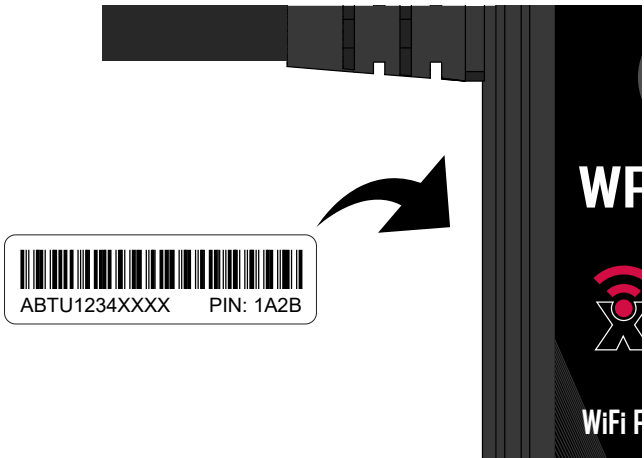
STORAGE

The Sensorlinx™ Heat Meter should be kept in its original shipping carton prior to installation. In order to retain the warranty coverage it should be stored properly:

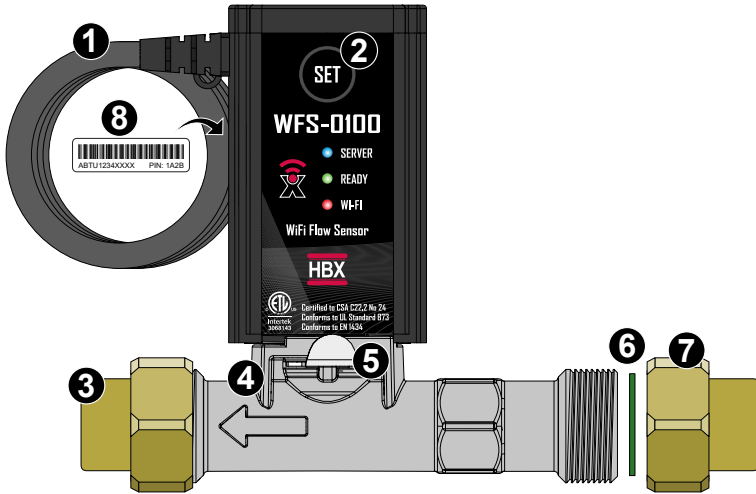
- Store within an ambient temperature range of +10°C to +40°C
- If possible, store in an air-conditioned environment where the relative humidity is less than 95%
- Do not store in places where the unit may come into contact with corrosive gases or liquids
- Do not store in an area or upon an unstable surface where it may become damaged due to falling

NAME AND PIN INFORMATION

The label displays the serial number which will match the serial number on your actual HBX Sensorlinx™ Sensor, the lot number, the bar code and the products PIN.



DESCRIPTION AND MAIN PARTS



DESCRIPTION

The SensorLinx™ Sensor System is designed to measure and record the thermal energy used in a residential or commercial heating or cooling system including HVAC, Solar thermal heating and Geothermal. The sensors can be used individually to track many system parameter configurations in real time using the HBX ThermoLinx™ App. When the Sensorlinx™ sensors are used in conjunction within your liquid system, the system allows for accurate Heat measurement.

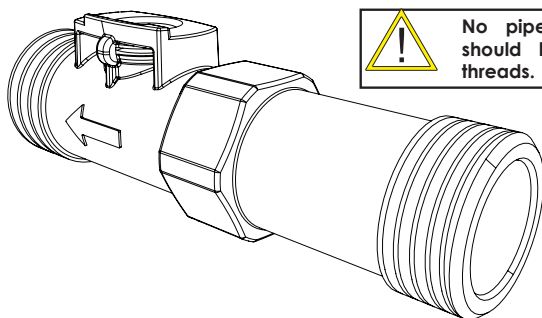



SENSOR REPLACEMENT: If one of the sensors fails or must be replaced when being used in Heat Meter configuration, both the WFS and WPS sensors must be replaced, as they come pre-paired.

COMPONENTS

1. **Power Supply Cable:** 24V.
2. **Wi-Fi Set Button:** Press set button to connect to local Wi-Fi network or create local Wi-Fi connection.
3. **NPT Tail Piece:** Tailpiece to connect to return/supply piping.
4. **Flow Pipe:** Composite or Stainless steel option.
5. **Sensor Clip:** Secure the sensor inside the flow pipe. Clip must be flush with the flow pipe.
6. **EPDM Flat Washer:** Washer must be placed inside before installation.
7. **Flow Pipe Union:** Brass Union
8. **Name Plate:** Contains sensor Sync-Code

TECHNICAL DATA AND DIMENSIONS



 No pipe tape/dope should be used on threads.

	BTU-0014	BTU-0030	BTU-0070	BTU-0130	BTU-0400
mm	82	88	129	137.5	180
in	3.23	3.46	5.08	5.41	7.09

Flow Pipe (Housing)	Union Pipe Config.	Torque	Flow Pipe Size	HBX Part #
Composite	3/4"	5 ft-lb / 6.78 N m	1/2"	BTU-0014
Composite	3/4"	5 ft-lb / 6.78 N m	1/2"	BTU-0030
Composite, Stainless Steel	1"		3/4"	BTU-0070
Composite, Stainless Steel	1 1/4"		1"	BTU-0130
Composite	1 1/2"		1 1/4"	BTU-0400

Flow Ranges

	BTU-0014	BTU-0030	BTU-0070	BTU-0130	BTU-0400
L/MIN	1.4 -14	3-30	7-70	13-130	20-400
GPM	0.36-3.69	0.70-7.92	1.84-18.49	3.43-34.34	5.28-105.67

TECHNICAL DATA

Input Voltage: 24VAC, ±10%, 60Hz, 0.1A

1 x Thermistor Output: Tank

1 x Modulating Output: 0.5VDC - 3.5VDC

Microprocessor: 8Bit, 64MHz

Languages: English

Temperature Measuring Range: 10-90 °C (50-194 °F)

Max. Pressure Range: 0-10 bar (0-145 psig)

WiFi: 2.4GHz Network Only

FCC ID: 2AHMRESP125

Liquid Types:

Aqueous media compatible with wetted materials. Kinematic viscosity less than or equal to 2 mm²/s (cSt). Potable Water, or a water mixture with Glycol, Methanol, or Ethanol.

ETL Listings:

Meets CSA C22.2

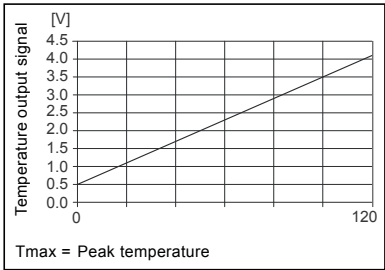
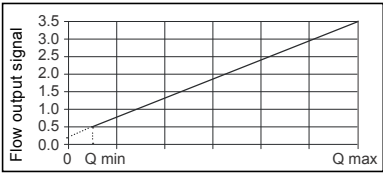
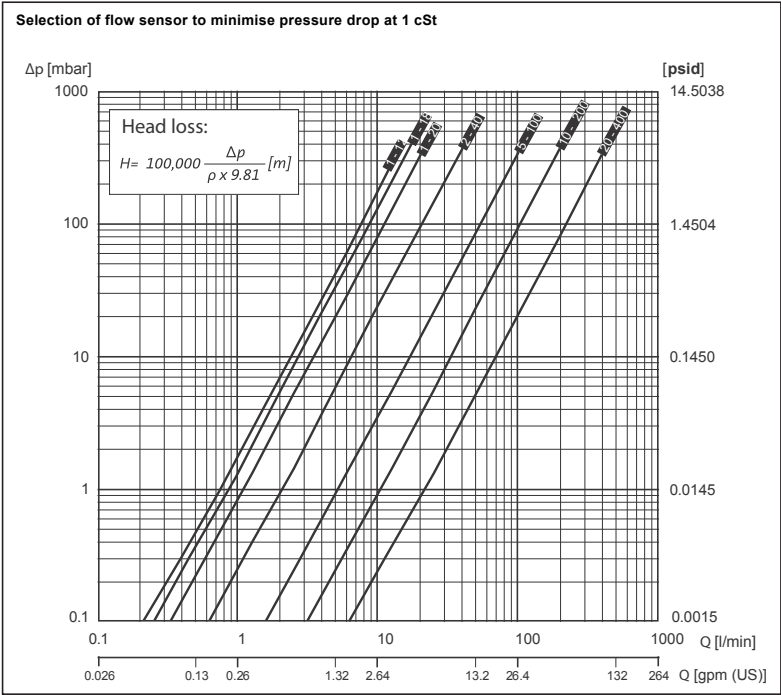
No. 24 Meets UL Standard 873

ETL Control No. 3068143

Storage: +10°C to +40°C

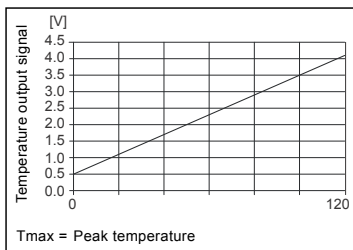
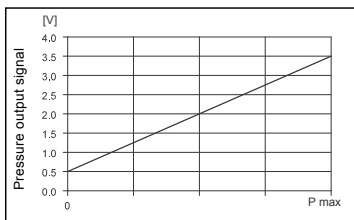
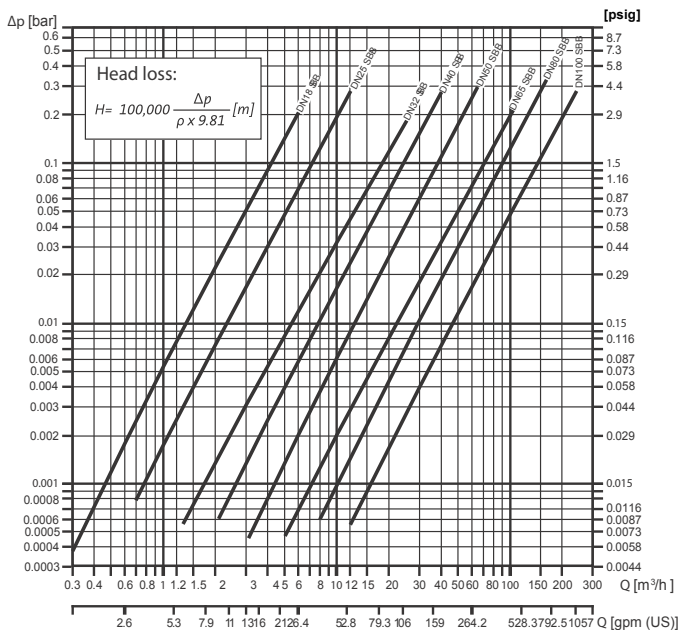
EN 1434 Approved

FLOW SENSOR TECHNICAL SPECIFICATIONS

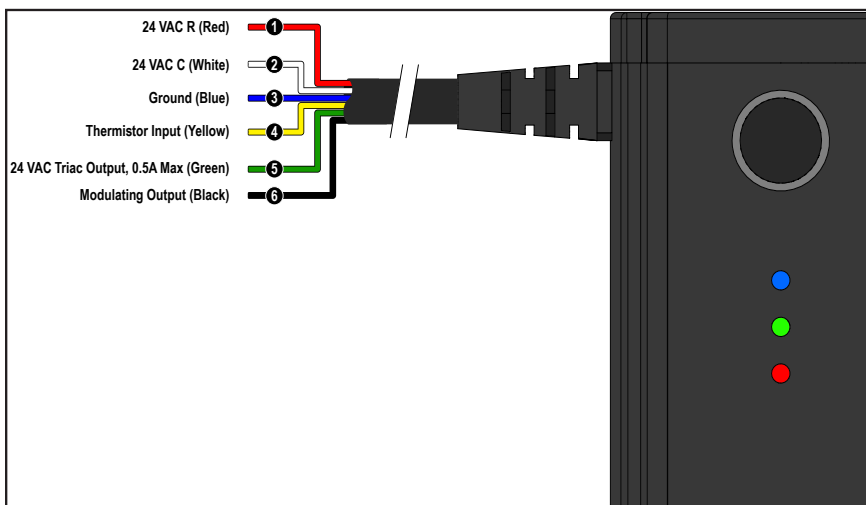


PRESSURE SENSOR TECHNICAL SPECIFICATIONS

Selection of flow sensor to minimise pressure drop at 1 cSt



DEVICE WIRING



1/2: Input Power: This input is to power the sensor. 1 Amps at 24VAC is required to power this device.

3. Ground Power: This input is for the ground wire. WFS-0100 Sensor must be grounded to the pipe. Refer to Device Wiring (Page 7-8).

4. Thermistor Input: Pins 4, 3 Optional temperature sensor. (Ex. Tank temp)



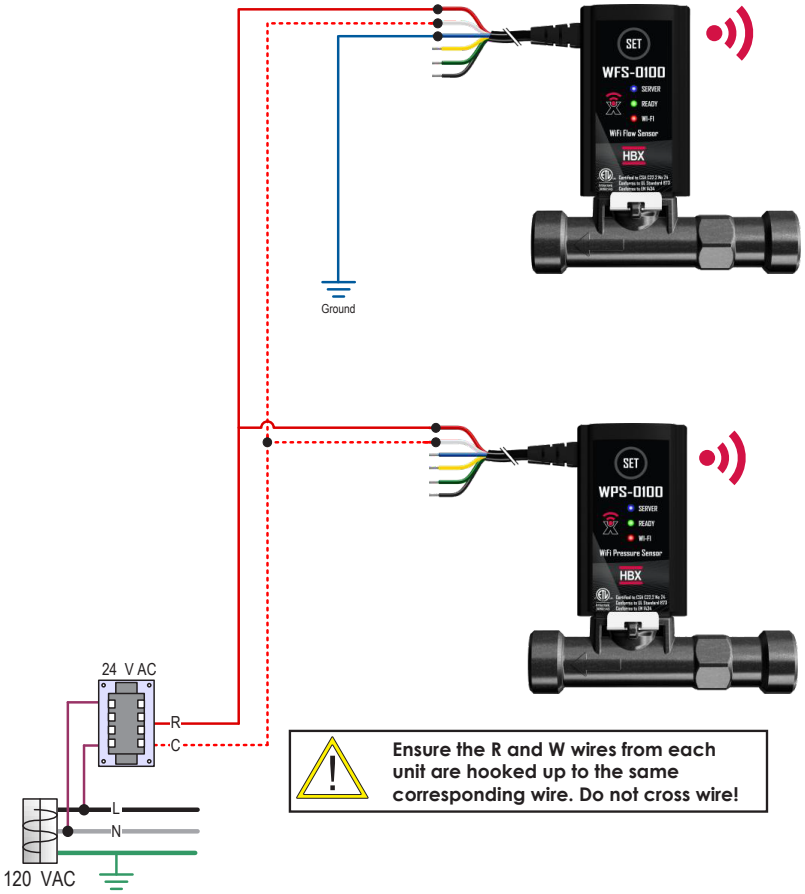
Under no circumstance should power be applied to these terminals! Permanent damage to the controller's circuitry may result.

5. Triac Output: Pins 5, 2 This input is to send a triac output to energize a relay. 24VAC is required to power the triac. Optional

6: Modulating Output: This output carries the modulating signal (0.5 – 3.5 VDC) to modulate the device. Optional

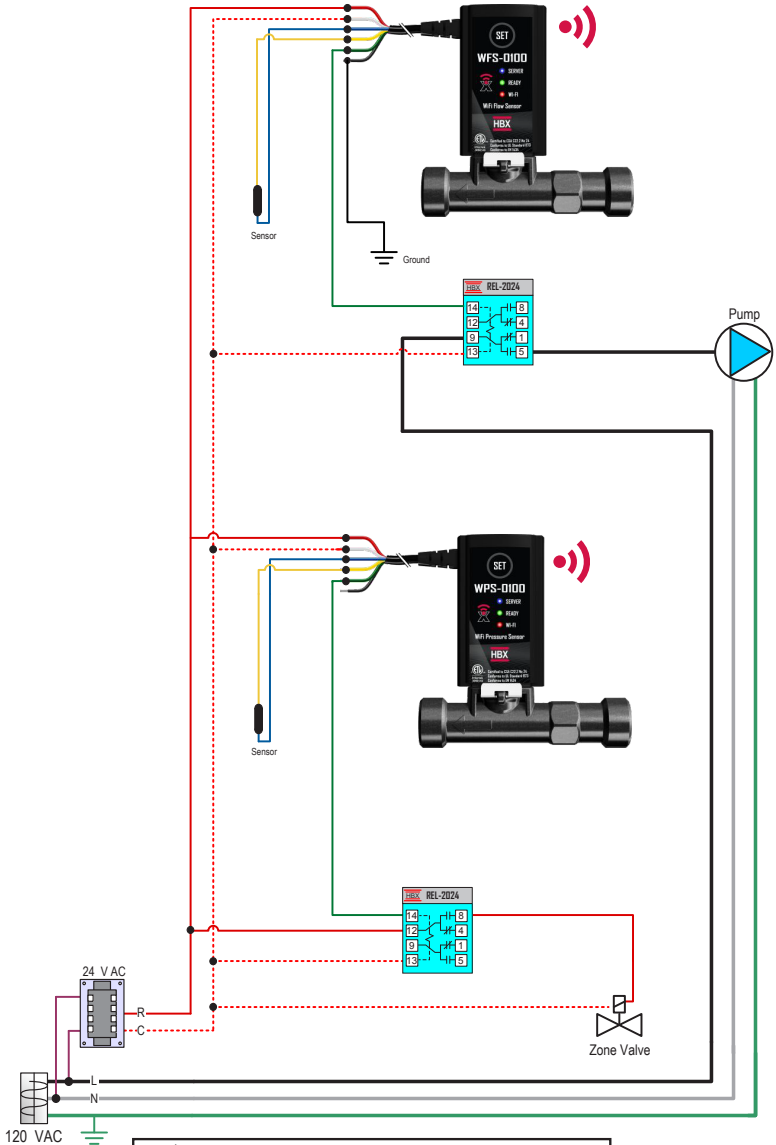
DEVICE WIRING

Standard Heat Meter Installation



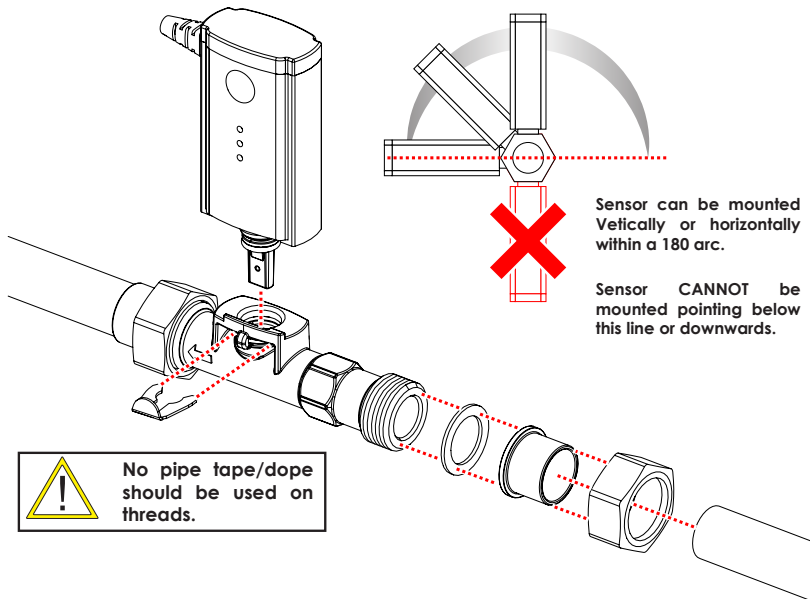
DEVICE WIRING

Heat Meter Installation with Optional Setpoint Output and Sensor Wiring



 **Ensure the R and W wires from each unit are hooked up to the same corresponding wire. Do not cross wire!**

INSTALLATION



DESCRIPTION

Install the flow sensor and pressure sensor in a location that will be easy to perform periodic maintenance. Install shut-off valves upstream and downstream of the sensors to aid installation and maintenance. Install a strainer or other filtering device upstream of the flow and pressure sensors.

The corresponding supply and return pipes must be integral to the same flow rate as measured by the flow meter. The flow meter must be installed on the return pipe and the pressure sensor on the supply pipe. The sensors can be installed in a horizontal or vertical position, following the flow direction indicated by the arrow on the body.



The first length of straight of pipe connected to the flow sensor must be a minimum of 3" long prior to a bend for the sensor to register a proper reading.

USING FLUIDS OTHER THAN WATER; GLYCOL, METHANOL, ETHANOL

Recommended Fluid Concentration

Heating: 0-50%

Cooling: 0-30%



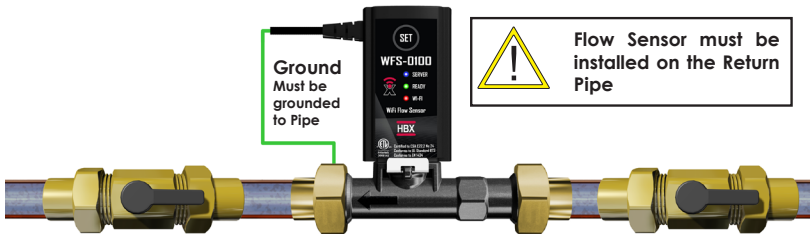
Fluids other than water must factor that the Kinematic viscosity less than or equal to 2 mm²/s (cSt). Heat measurement calculations performance will be affected by the viscosity.



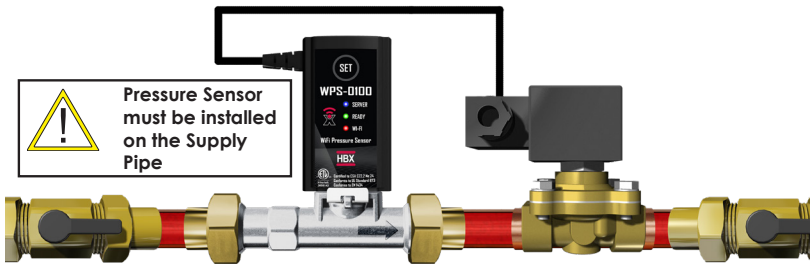
While initially filling the system take care to not produce any water hammer at the sensor. Slowly increase initial flow and pressure to the sensor. Failure to do so can cause the sensor to fail.

INSTALLATION

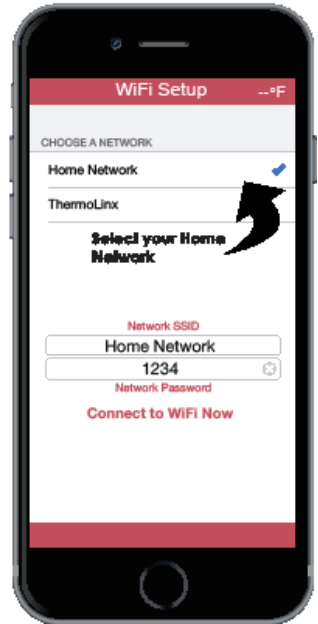
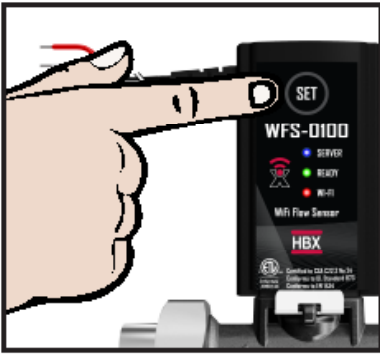
Standard Heat Meter Installation



Installation with Optional Solenoid Valves



CONNECTING TO A NETWORK (ANDROID)



1. Press the SET button on the Flow Sensor, and wait 60 seconds. If the red LED light (Wi-Fi) on the sensor is not blinking, press and hold down the reset button for 10 seconds, or until all the LED's on the sensor turn off, and then release.



Do not use the WPS-0100 Pressure sensor for Wi-Fi Setup. The WFS-0100 is the master sensor of the set. Both sensors will connect to a wifi network when setup is done.

2. Go into your smartphone device settings and then go into your Wi-Fi settings.
3. Select the TLBTUXXYY network. The XXYY number will correspond to the serial number on the device.
4. Once you have selected the TLBTUXXYY network a prompt will display for the password.
5. The password for the device is YXXYYXX, where the XX is the first 2 digits of the device numbers and YY are the last 2 digits of the device number. (E.g. TLBTU1234 , the password would be 34123412)
6. Once the password is input correctly then you will be taken to the main Wi-Fi settings page on the phone. Wait until you get a Green check mark beside the TLBTUXXYY network before moving on.
7. Once you have the check mark then exit the Wi-Fi settings on your phone and open the ThermoLinX App.
8. Upon opening the ThermoLinX App, after about 10 seconds a selection menu will appear. Select Setup Device. If this menu does not appear there is a Setup Wi-Fi button in the top left of the screen to press.
9. Once you are in the setup, a menu will appear. Type in the 4 digits in the TLBTU section that correspond to your device numbers. TLBTU XXYY, **leave the ThermoLinX position empty**

CONNECTING TO A NETWORK (ANDROID)

10. In the network SSID, type the network name of the building Wi-Fi you are trying to put the SensorLinx device on.

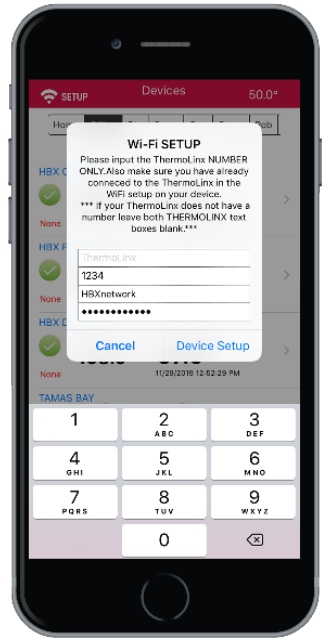
11. In the Password, type the password for the building Wi-Fi you are trying to put the SensorLinx device on.

12. When finished press the Device Setup button. This will connect to the TLBTUXXYY device and send it the local network information.

13. Once the App has sent all the information it will reset the SensorLinx device automatically and it will try to connect to the local building Wi-Fi with the SSID and password that you had provided.

14. Once the 120 second wait period is up you should see all 3 LED's on the SensorLinx device stay on solid. RED, GREEN and BLUE.

15. At this point you are now ready to add the SensorLinx device to your location.

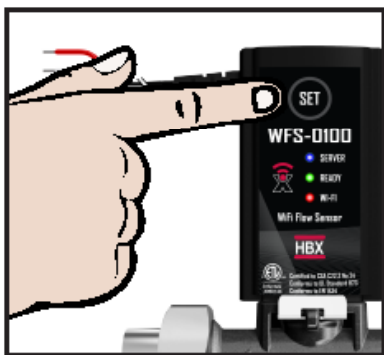


Connections can only be made to a 2.4GHz network.



Home network name cannot contain more than 30 characters. The password should not contain any special characters.

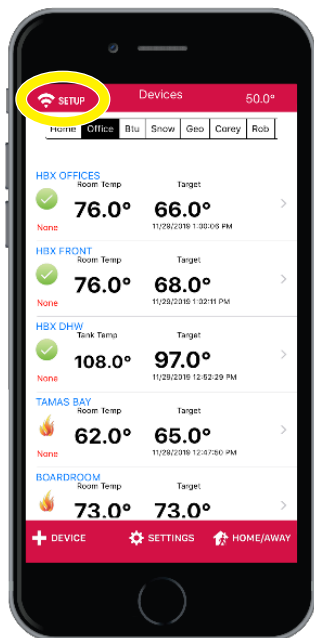
CONNECTING TO A NETWORK (IOS)



1. Press the SET button on the BTU Flow Sensor, and wait 60 seconds. If the red LED light (Wi-Fi) on the sensor is not blinking, press and hold down the reset button for 10 seconds, or until all the LED's on the sensor turn off, and then release.



Do not use the WPS-0100 Pressure sensor for Wi-Fi Setup. The WFS-0100 is the primary sensor of the set. Both sensors will connect to a wifi network when setup is done.



2. Go into your smartphone device settings and then go into your Wi-Fi settings.
3. Select the TLBTUXXYY network. The XXYY number will correspond to the serial number on the device.
4. Once you have selected the TLBTUXXYY network a prompt will display for the password.
5. The password for the device is YYXXYYXX, where the XX is the first 2 digits of the device numbers and YY are the last 2 digits of the device number. (E.g. TLBTU1234 , the password would be 34123412)
6. Once the password is input correctly then you will be taken to the main Wi-Fi settings page on the phone. Wait until you get a Green check mark beside the TLBTUXXYY network before moving on.
7. Once you have the check mark then exit the Wi-Fi settings on your phone and open the ThermoLinX App.
8. Upon opening the ThermoLinX App, after about 10 seconds a selection menu will appear. Select Setup Device. If this menu does not appear there is a Setup Wi-Fi button in the top left of the screen to press.

CONNECTING TO A NETWORK (IOS)

9. Once you are in the setup, a menu will appear. Type in the 4 digits in the TLBTU section that correspond to your device numbers. TLBTU XXYY , leave the ThermoLinX position empty

10. In the network SSID, type the network name of the building Wi-Fi you are trying to put the SensorLinX device on.

11. In the Password, type the password for the building Wi-Fi you are trying to put the SensorLinX device on.

12. When finished press the Device Setup button. This will connect to the TLBTUXXYY device and send it the local network information.

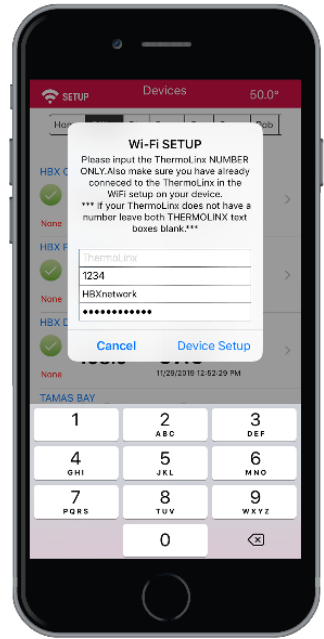
13. Once the App has sent all the information it will reset the SensorLinX device automatically and it will try to connect to the local building Wi-Fi with the SSID and password that you had provided.

14. Once the 120 second wait period is up you should see all 3 LED's on the SensorLinX device stay on solid. RED, GREEN and BLUE.

- If only the green light is solid, this means that you have inputted the incorrect password for the network, or an incorrect network name.

- If the green and the red light are on then you will need to open port 1314 of your router to allow the ThermoLinX to communicate with our server. If you need assistance with this please contact your internet provider.

15. At this point you are now ready to add the SensorLinX device to your location.



Connections can only be made to a 2.4GHz network.



Home network name cannot contain more than 30 characters. The password should not contain any special characters.

CONNECTING TO A NETWORK (IOS)

Wi-Fi Setup

ThermoLinX: This is **only** for HBX Thermostats, snow melt, boiler and geothermal controllers. Please do not enter any information.

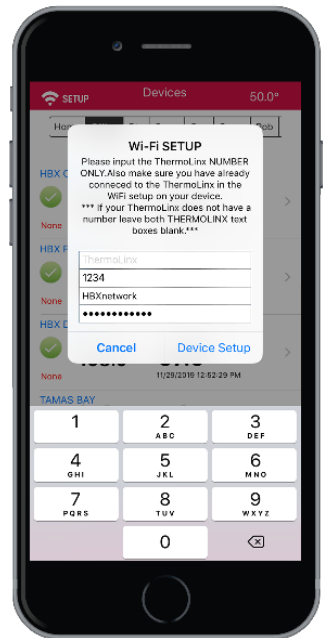
TLBTU: This is for **only** SensorLinX Heat Sensors. Please input the last four digits of your ThermoLinX network.

Network SSID: Enter the Wi-Fi network name that the system will connect to. (Case Sensitive)

Password: Enter the Wi-Fi network password.

Network name cannot contain more than 30 characters. The password should not contain any special characters. If using WEP 64bit or 128bit security must not be in Shared Mode. If using WEP 128bit, the password/key must be 26 characters long

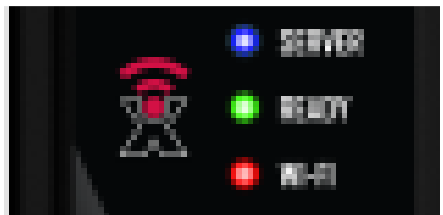
After entering all the required information please select "Device Setup". The control will now establish connecting ThermoLinX to your Wi-Fi network. Please allow for 120 seconds to connect to your Wi-Fi Network.



LED Lights

Once connected check the red, green, and blue LED lights on the WFS-0100. All LED lights should be steady.

If you do not see the above description on the control you are not connected to a Wi-Fi network.



Solid Green Only: incorrect password

Solid Red and Green: ThermoLinX is connected to your Wi-Fi but your network port 1314 is closed and not allowing communication to the HBX server, please contact your internet provider to rectify this.



Connections can only be made to a 2.4GHz network.

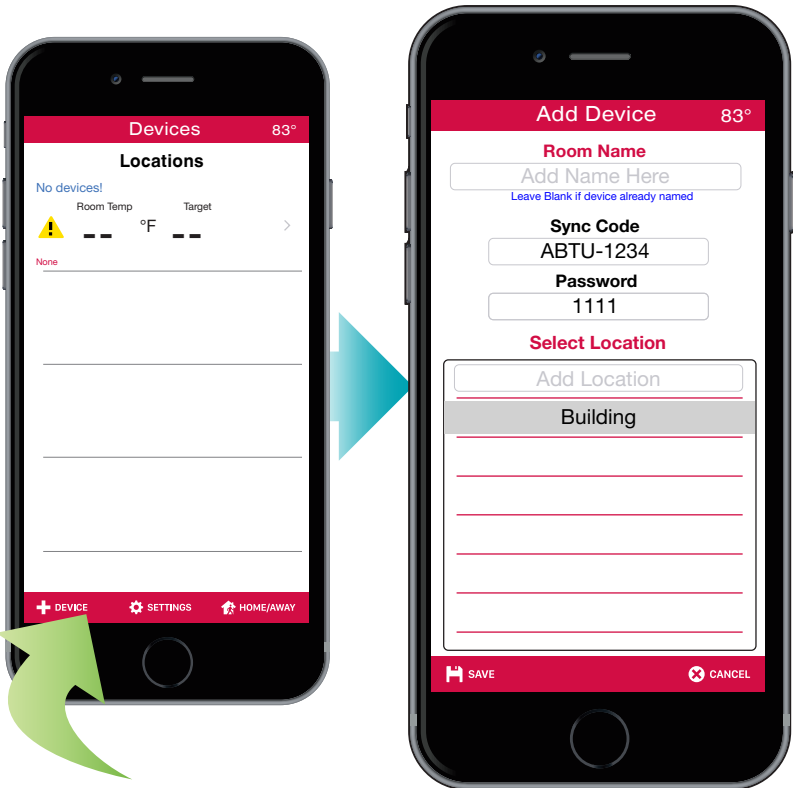
ADDING SENSORS TO THE THERMOLINX APP

1. On the home screen, select "+ Device".
2. Enter the sync code for the WFS-0100 flow sensor. The sync code can be found on the back of the sensor within the serial number.
3. Enter password: 1111. This password is the default password for all sensors.
4. Enter a system location name and select done/enter. (ex. Home, Office, Cabin, ect.) This is the name of the system location, not the sensor you added.



Symbols and numbers cannot be used in location name

5. After you have entered the system location name, select the location so it is highlighted, and select save.

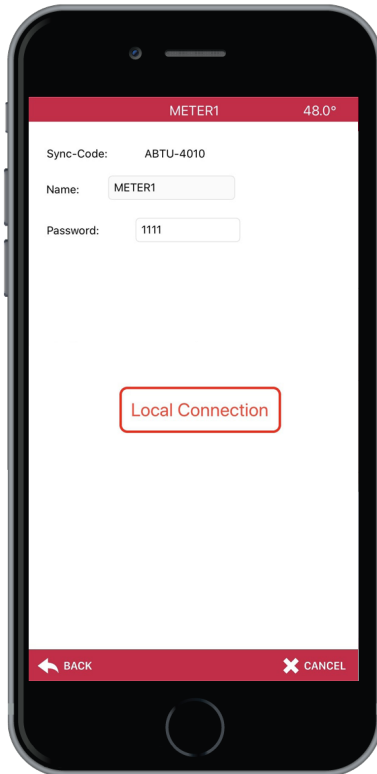


NAVIGATING THE THERMOLINX APP



1. **Relay Closed:** Indicates if the relay is closed to activate a pump or valve.
2. **Setup:** Adjust Relay output, Fluid, and thermistor settings.
3. **Sensor Info:** Provides sensor type and unit serial number.
4. **Alarms:** Set alarm notification for flow, temperature, and pressure.
5. **Temperatures:** View temperature, flow and pressure data in real time
6. **System Status:** View Current Heat measurement and lifetime Heat accumulation for days, week, monthly, and yearly.
7. **Bar Graph/ Line Graph:** View Current and historical Heat measurement data graphing.
8. **Details:** View current and historical Heat in raw data.

LOCAL CONNECTION



Local Connection is **ONLY** used when there is no Wi-Fi connected to the heat meter. Local Connection does not work with **AFLO** or **APRE** sensors. The local connection will automatically connect to the sensor and download all the current data from the app. This will allow the user to see the current usage statistics of devices not connected to the server. Once the button is pressed it will connect to the heat meter, and then go back to the main page where it will start to collect the data.

To use local connection, you will need to add the Sensor to the app (see page 12), then select local connection in the "Settings" options.

LIMITED WARRANTY

HBX Controls warrants each of its products to be free from defects in workmanship and its materials under normal use and service for a period of 24 months from date of manufacture or 12 months from date of purchase from an HBX Authorized Dealer, if within the above documented period after date of manufacture.

If the product proves to be defective within the applicable warranty period, HBX on its sole discretion will repair or replace said product. Replacement product may be new or refurbished of equivalent or better specifications, relative to the defective product. Replacement product need not be of identical design or model. Any repair or replacement product pursuant to this warranty shall be warranted for not less than 90 days from date of such repair, irrespective of any earlier expiration of original warranty period. When HBX provides replacement, the defective product becomes the property of HBX Controls.

Warranty Service, within the applicable warranty period, may be obtained by contacting your nearest HBX Controls office via the original Authorized Agent and requesting a Return Material Authorization Number (RMA #). Proof of purchase in the form a dated invoice/receipt must be provided to expedite the issuance of a Factory RMA.

After an RMA number has been issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit. The RMA number must be visible on the outside of the package and a copy included inside the package. The package must be mailed or otherwise shipped back to HBX with all costs of mailing/shipping/insurance prepaid by the warranty claimant.

Any package/s returned to HBX without an approved and visible RMA number will be rejected and shipped back to purchaser at purchaser's expense. HBX reserves the right, if deemed necessary, to charge a reasonable levy for costs incurred, additional to mailing or shipping costs.

LIMITATION OF WARRANTIES

If the HBX product does not operate as warranted above the purchasers sole remedy shall be, at HBX's option, repair or replacement. The foregoing warranties and remedies are exclusive and in lieu of all other warranties, expressed or implied, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for a particular purpose/application. HBX neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale, installation maintenance or use of HBX Controls products.

HBX shall not be liable under this warranty; if its testing and examination discloses that the alleged defect in the product does not exist or was caused by the purchasers or third persons misuse, neglect, improper installation or testing, unauthorized attempts to repair or any other cause beyond the range of intended use, or by accident, fire, lightning or other hazard.

LIMITATION OF LIABILITY

In no event will HBX be liable for any damages, including loss of data, loss of profits, costs of cover or other incidental, consequential or indirect damages arising out of the installation, maintenance, commissioning, performance, failure or interruption of an HBX product, however caused and on any theory of liability. This limitation will apply even if HBX has been advised of the possibility of such damage.

LOCAL LAW

This limited warranty statement gives the purchaser specific legal rights. The purchaser may also have other rights which vary from state to state in the United States, from Province to Province in Canada and from Country to Country elsewhere in the world.

To the extent this Limited Warranty Statement is inconsistent with local law, this statement shall be deemed modified to be consistent with such local law. Under such local law, certain disclaimers and limitations of this statement may not apply to the purchaser. For example, some states in the United States, as well as some governments outside the United States (including Canadian Provinces), may: Preclude the disclaimers and limitations in this statement from limiting the statutory rights of a consumer (e.g. United Kingdom);

Otherwise restrict the ability of a manufacturer to enforce such disclaimers or limitations; or grant the purchaser additional warranty rights which the manufacturer cannot disclaim, or not allow limitations on the duration of implied warranties.

Phone: +1 (408) 720-0029 Fax: +1 (408) 720-0054
Email: info@hitcontrols.com Web: www.hitcontrols.com

Toll Free Technical Support: +1 (855) 410 2341

