Installation Manual

SensorLinx™ Energy Meter Installation Guide

Version 1.0.0

ENG-0100-14

ENG-0100-30

ENG-0100-70

ENG-0100-130

HBX Control Systems Inc.

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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.

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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-0200 (Temperature & Flow Sensor)
- 1 x WPS-0200 (Temperature & Pressure Sensor)
- 4 x EPDM O-rings
- 2 x Dual unions, tailpieces - G-Thread, 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

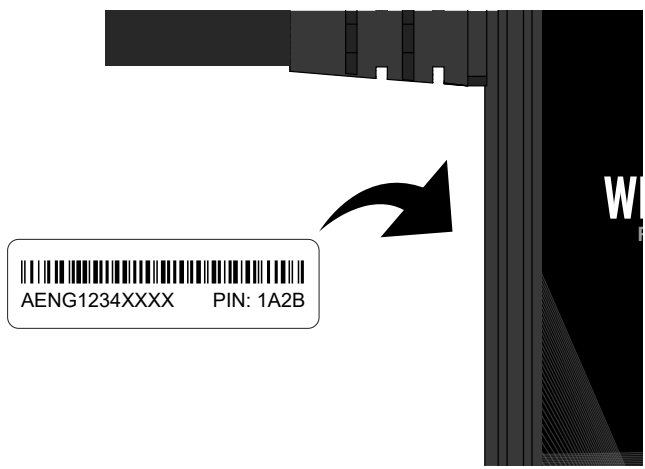
STORAGE

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

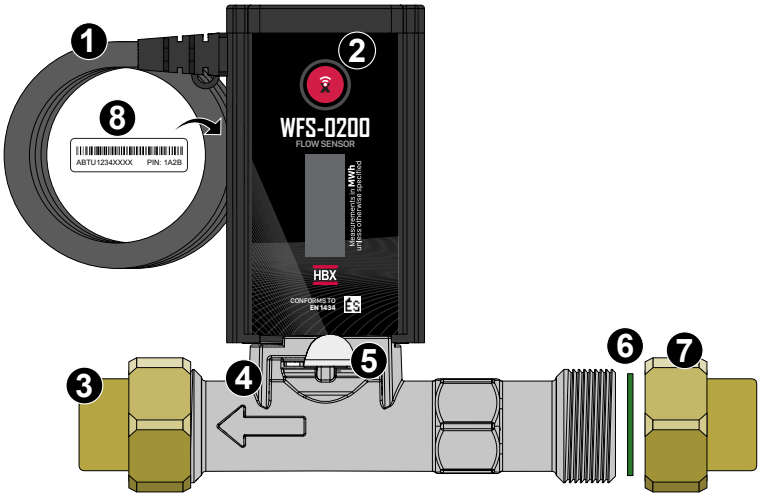
- Store within an ambient temperature range of +10ºC to +40ºC
- If possible, store in an air-conditioned environment where the relative humidity is less than 95%
- Do not store in places where the unit may come into contact with corrosive gases or liquids
- Do not store in an area or upon an unstable 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 Energy 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. **Sweat 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

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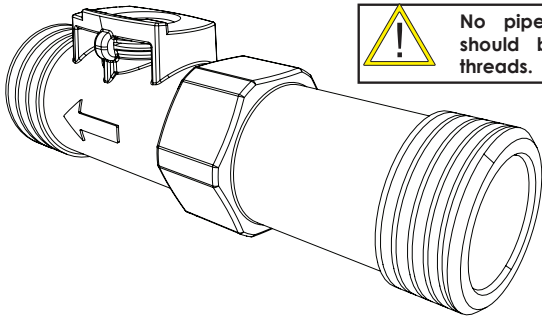
TECHNICAL DATA AND DIMENSIONS



No pipe tape/dope should be used on threads.

	ENG-010-14	ENG-010-30	ENG-0100-70	ENG-010-130
mm	82	88	129	137.5
in	3.23	3.46	5.08	5.41

Flow Pipe (Housing)	Union Pipe Config.	Torque	Flow Pipe Size	HBX Part #
Composite	3/4"	5 ft-lb / 6.78 N m	½"	ENG-0100-14
Composite	3/4"	5 ft-lb / 6.78 N m	½"	ENG-0100-30
Composite, Stainless Steel	1"		¾"	ENG-0100-70
Composite, Stainless Steel	1 1/4"		1"	ENG-0100-130
Composite	1 1/2"		1 ¼"	ENG-0100-400

Flow Ranges

	ENG-010-14	ENG-010-30	ENG-0100-70	ENG-010-130
L/MIN	1.4 -14	3-30	7-70	13-130
GPM	0.36-3.69	0.70-7.92	1.84-18.49	3.43-34.34

Technical Data

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

1 x Thermistor Output: Tank

24 VAC Triac Output, 0.5A Max

1 x Modulating Output: 0.5VDC - 3.5VDC

Microprocessor: 16bit, 140MHz

Languages: English

Temperature Measuring Range: -20 - 100°C (-4 - 212 °F)

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

WiFi: 2.4GHz Network Only

FCC ID: 2AHMRESP125

Liquid Types:

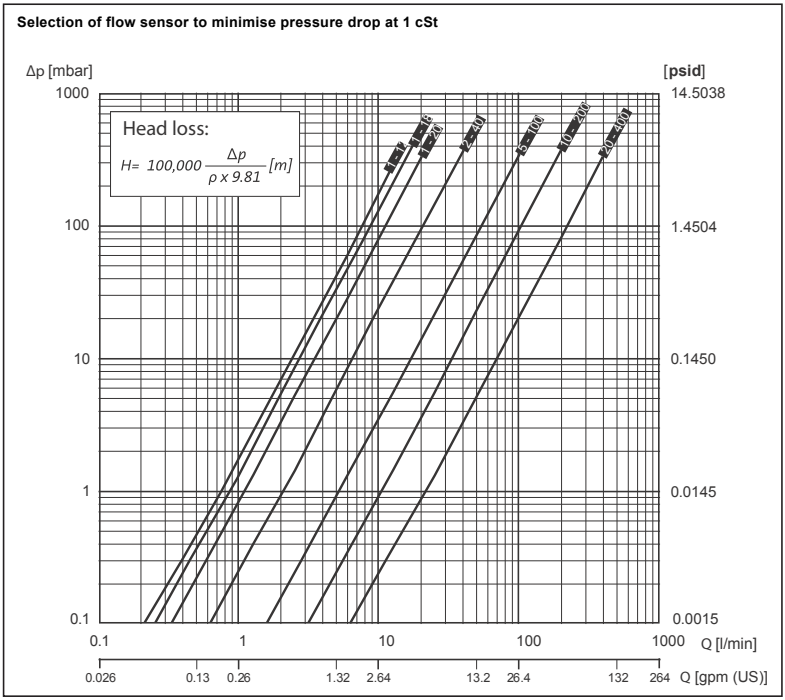
Aqueous media compatible with wetted materials. Kinematic viscosity less than or equal to 2 mm2/s (cSt). Potable Water, or a water mixture with Glycol, Methanol, or Ethanol.

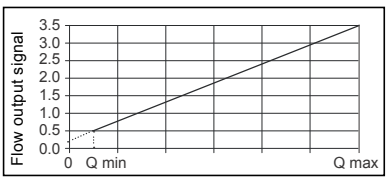
Storage: +10°C to +40°C

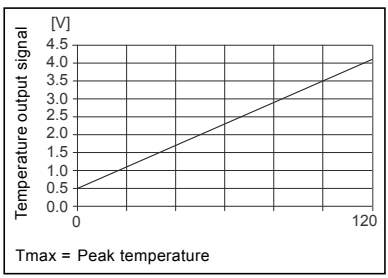
EN 1434 Approved

ASTM E3137 – 2018

FLOW SENSOR TECHNICAL SPECIFICATIONS







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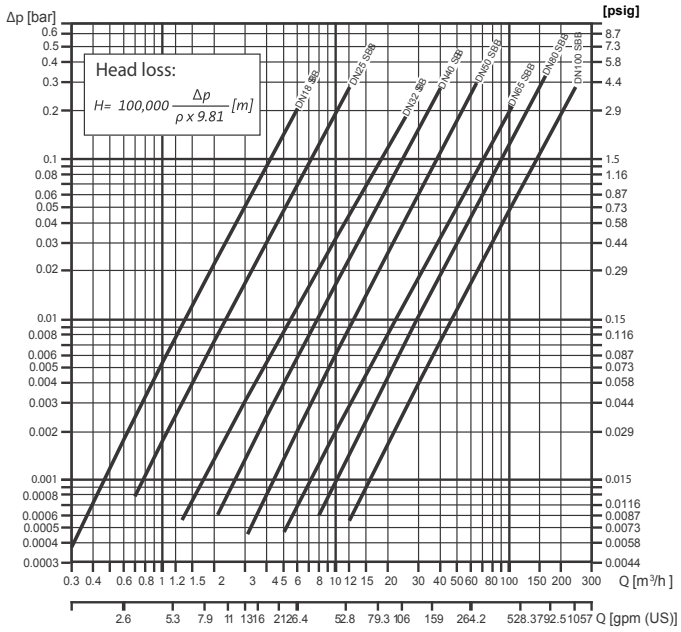
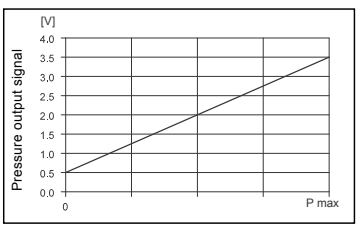
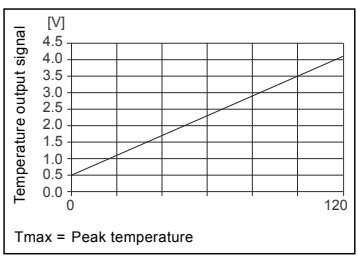
PRESSURE SENSOR TECHNICAL SPECIFICATIONS

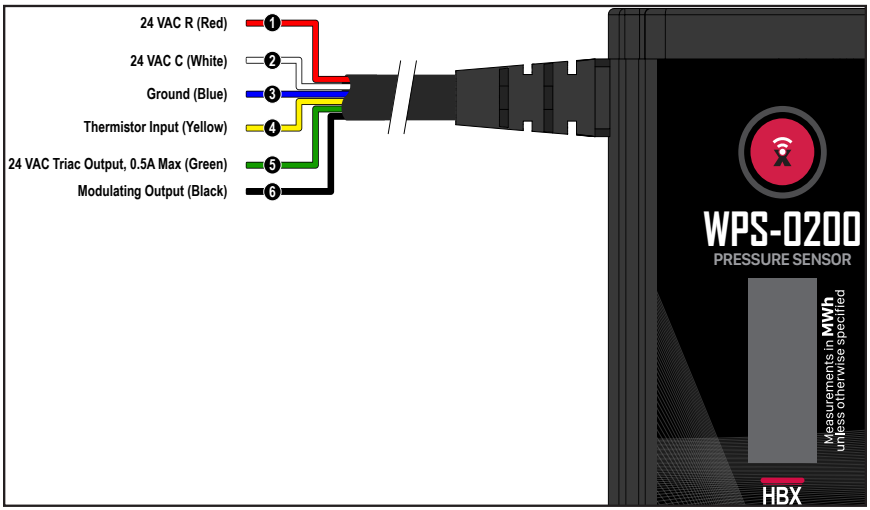
Selection of flow sensor to minimise pressure drop at 1 cSt







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-0200 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**

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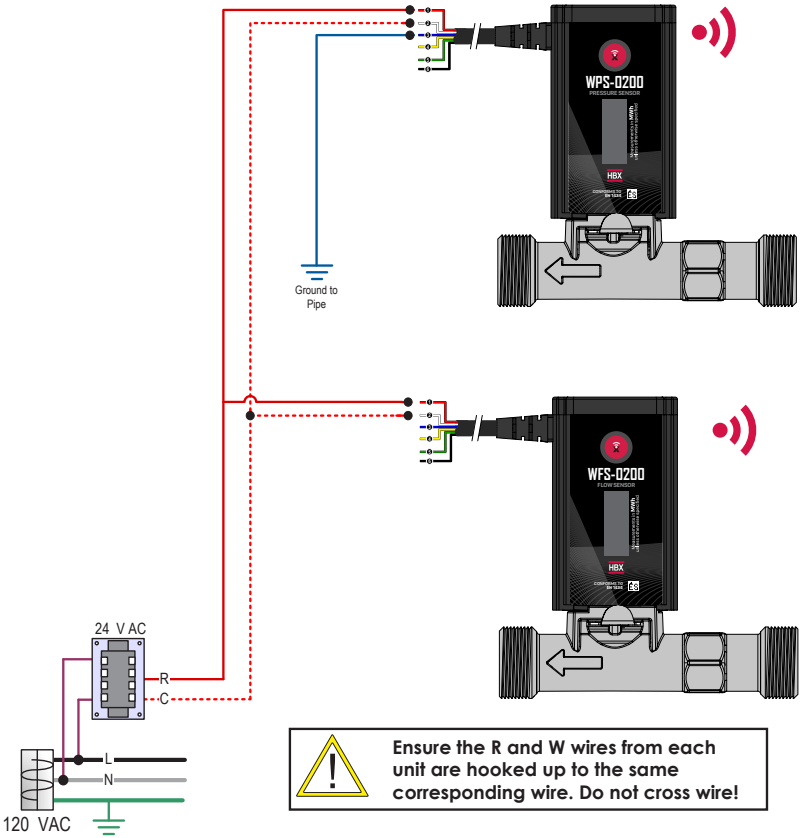
DEVICE WIRING

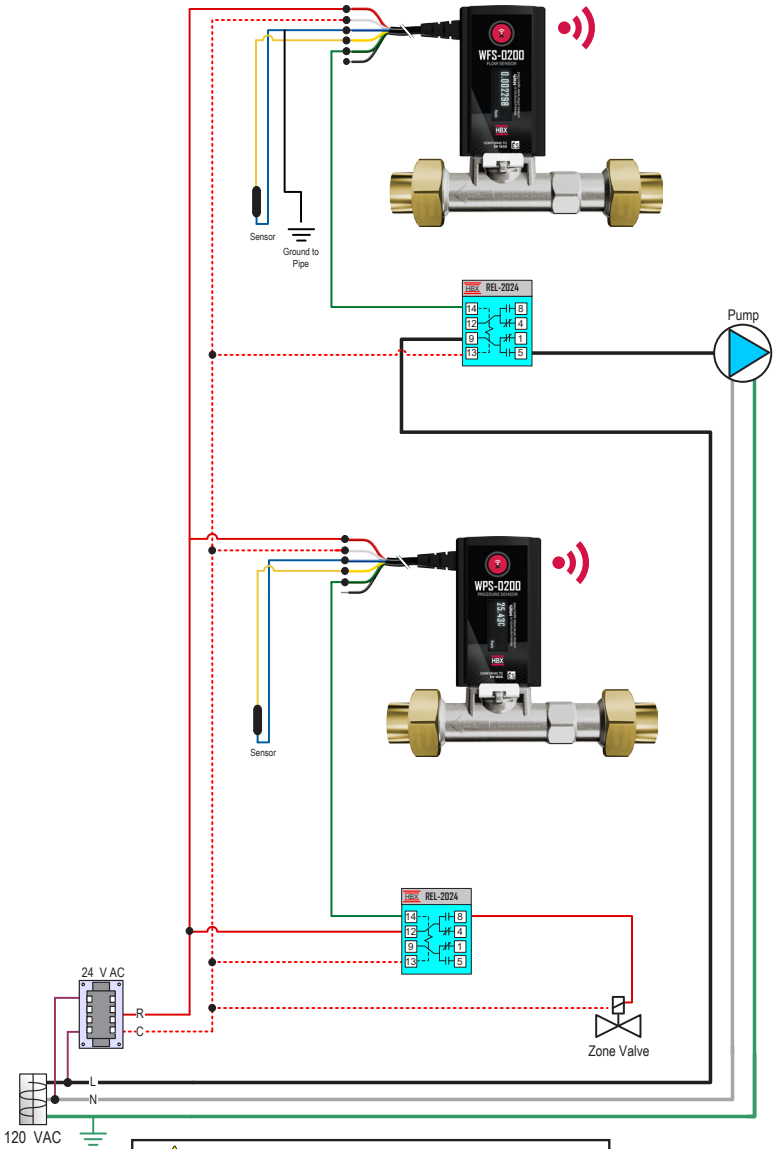
Standard Energy Meter Installation



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

DEVICE WIRING

Energy 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!

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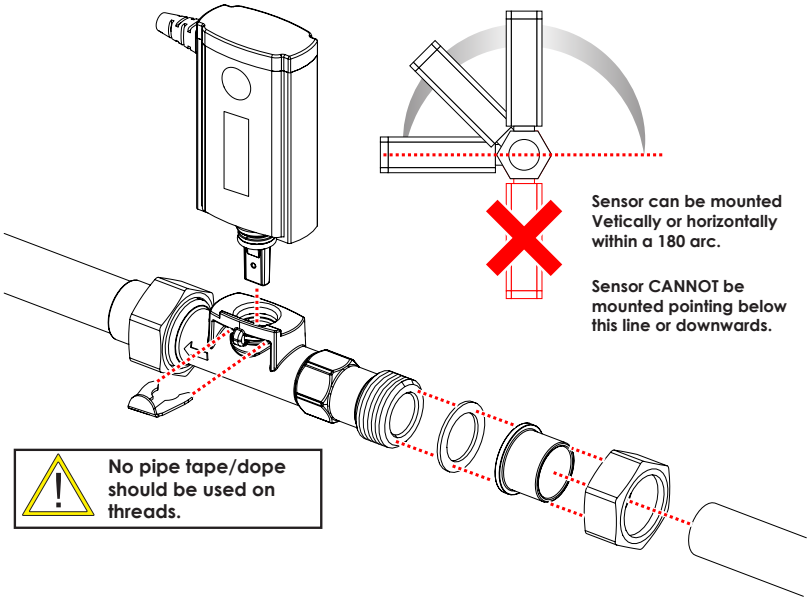
INSTALLATION



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

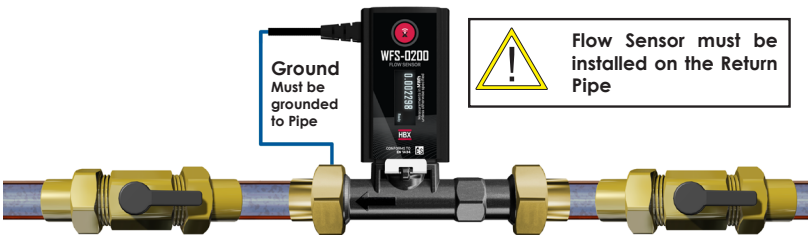
Heating: 0-50%
Cooling: 0-30%

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.

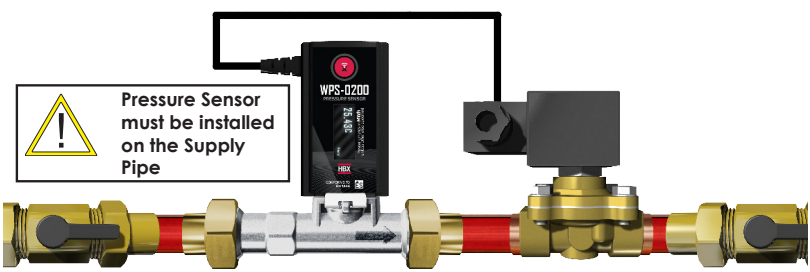
While initially filling the system take care to not produce any water hammer at the sensor. Slowly increase initial flow and pressure to the sensor. Failure to do so can cause the sensor to fail.

INSTALLATION

Standard Energy Meter Installation



Installation with Optional Solenoid Valves



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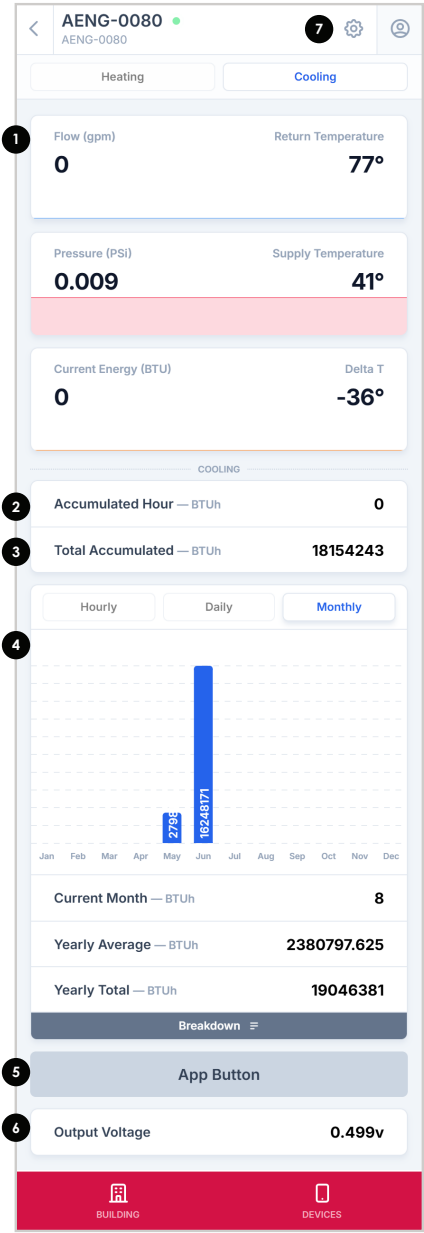
Controlling a ENG-0100 with the SensorLinx mobile app

Once a building is clicked on it will list all the devices linked to that building. Each device will show a preview of the measurements and readings they are taking.

Once a device is clicked on this will proceed to show the current readings and measurements in more detail. Things to note:

1. Readings and measurements
2. Accumulated hours
3. Total accumulated hours
4. Graphs – tracking activity and measurements over periods of time
5. App Button – A toggle button that can be activated via the app to turn something on
6. Output Voltage
7. Settings Menu – used to access more settings and the page for Advanced settings and Configure Wi-Fi.

Read more on the next page



SensorLinx™ Mobile App

The SensorlinxTM mobile app is available for Apple iOS (APP Store) and Android® devices (Google Play). The mobile app allows for remote monitoring and control for HBX Controls devices.

Now available on the Apple App Store and Google Play

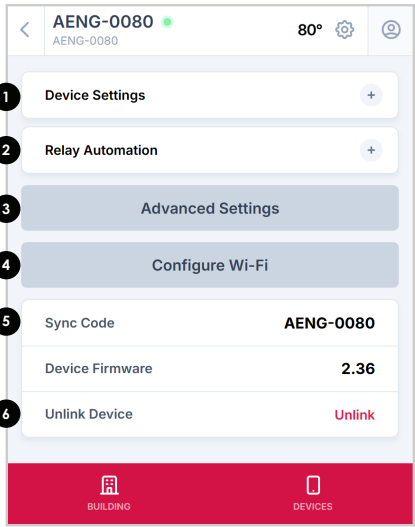
For detailed instructions on setting up the SensorLinx mobile app please refer to the SensorLinx app manual

ANDROID APP ON Google Play

Available on the App Store

Configuring ENG-0100 with the SensorLinx mobile app

Selecting the device settings menu will provide an interface for configuring the device. Things to note:



1. Device Settings – this shows the device names, name of the app button and the unit measurements. Each of these can be changed here
2. Relay Automation – Enable On or Off
3. Advanced Settings – Shows a breakdown of readings and Wi-Fi strength and allows for testing numbers to implemented to the device under Test Settings
4. Configure Wi-Fi – to connect device to Wi-Fi
5. Information of Sync code and Firmware and App versions
6. Unlink Device – to remove the device from the buildings devices list

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Connecting an ENG-0100 to a Wi-Fi network

From the device settings menu, select **Configure Wi-Fi**. You may be prompted to allow Permissions to locate local devices. This permission is required.

1. Select Start **Wi-Fi Setup**. This will prompt you to join the Wi-Fi network of the target device. Confirm this to allow the SensorLinx app to communicate with the device.

2. The device will scan for nearby networks and return a list that includes the connection quality.

3. **Select the Wi-Fi network** that this device will use to connect to the internet and enter the credentials when prompted.

   If the connection is unsuccessful, a notification will be displayed that will allow you try again.

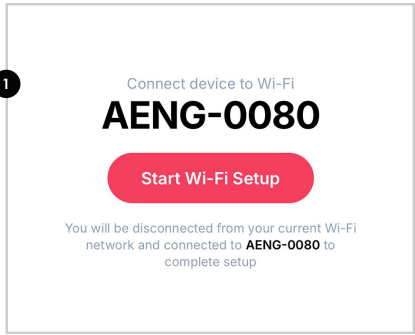
   Once connected, a green dot will appear next to the device in the device list.

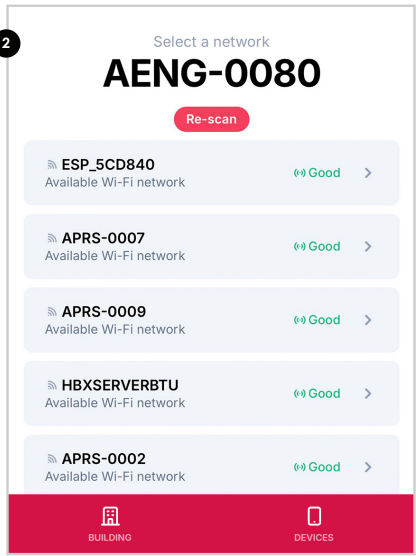
Please note:

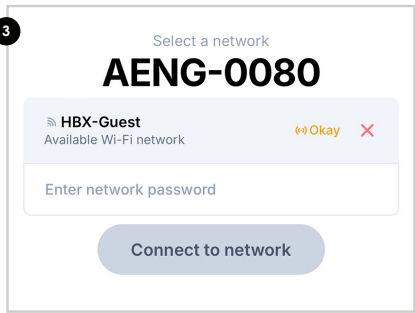
The device may take a few moments to connect to the network and begin transmitting data.

To allow for connection to the network the following Ports will need to be open:

- ENG: Port 2110
- FLW: Port 2120
- PRS: Port 2130





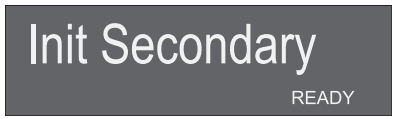


Device Startup

Startup screen. Shows the Sync Code of the device.

Startup screen. Shows the Sync Code of the device.

Shows if device is Primary or Secondary unit.This will not show if device is a FLW or PRS



Shows if device is secondary unit. Secondary unit sync code will always be 1 digit higher than the primary. These are linked units and will only work as matched pair. Sync AENG-0088 primary is matched to AENG-0089 Secondary.

Initial Running

Typical screen after startup sequence. This screen shows the amount of energy used as well as READY , so the WIFI is ready to connect but has not connected yet

Shows the energy used as well that the unit has connected to WIFI but has not started communication to the server

Shows energy used and that the devi ce has connected and is communication to the server properly

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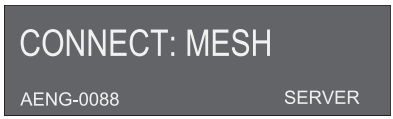
Connection Setup

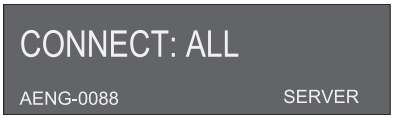
The SensorLinx device is capable of connecting in many ways. The unit has a built-in mesh networking capability as well as automatic HBX Router recognition for seamless and easy WIFI setup. The device comes initially setup in manual mode, meaning you can use the HBX SensorLinx APP to setup your SSID and password. These SensorLinx device can create a self administering and self healing mesh network to streamline setup.

To access the connection setup screen , hold the button in for 5 seconds. There is a counter on the screen to help you. The BTN# in the bottom right is the counter. Once you see BTN5 you can release and you will be in the connection screen.

Use this setting to set up the device manually from the APP

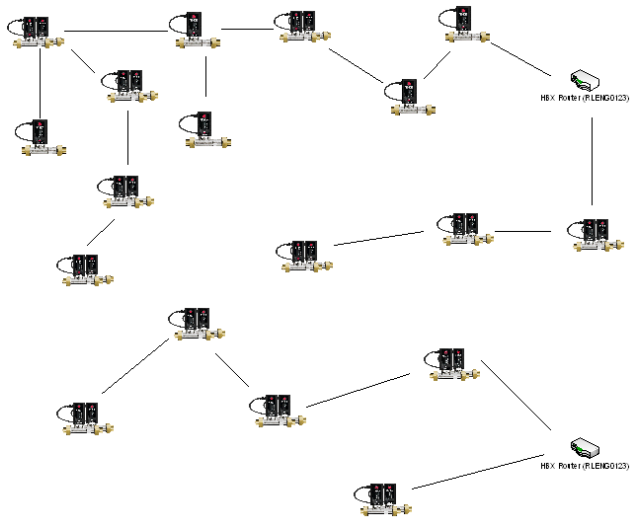


Use this setting if you would like this unit to make a connection to another SensorLinx device in a mesh network. Take note that at least 1 SensorLinx device must already be connected to the Wi-Fi Network



Use this setting if you have HBX Routers also being connected to the network. This will allow the device to either connect to other SensorLinx devices or if a router is close it will OPT to connect to that instead , for a more stable connection.

Use this setting if you only want the SensorLinx device to connect to and HBX Router



Main Setup

By pressing the button on the device you are able to cycle though other information screens. Some screen will not show if you are using a FLW or PRS

Shows current flow

Shows current temperature on that device

Shows current energy usage. Instantaneous value

Shows a temporary accumulated energy value. Resettable in the App

Show temporary accumulated Volume , resettable in the App and on power down

Current delta T if this is an Energy meter

Shows if the 24VAC output is currently ON or OFF

Shows the 0.5 to 3.5VDC output, this is based on flow, or pressure.

Shows the current connection status and what SSID you are connected to including other MESH or HBX Routers

Secondary units

There is no connection sequence necessary on a secondary unit. It will automatically connect to it primary unit. It will show LINKED in the bottom right when it is connected to its primary unit.

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LIMITED WARRANTY

HBX Controls warrants each of its products to be free from defects in workmanship and 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

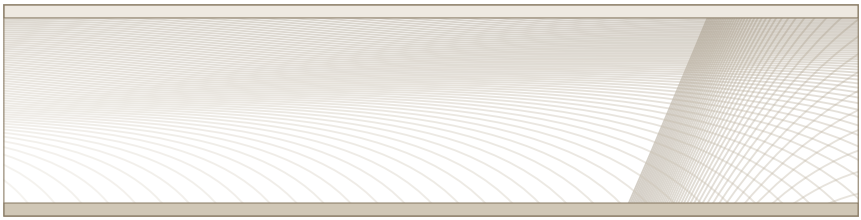
This limited warranty statement gives the purchaser specific legal rights. The purchaser may also have other rights which vary from state to state in the United States, from Province to Province in Canada and from Country to Country elsewhere in the world.

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 (403) 720-0029 Fax: +1 (403) 720-0054
Email: info@hbxcontrols.com Web: www.hbxcontrols.com

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



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