

# AutoFlex CONNECT



**Installation guide**



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## ***Chapter 1: Introduction***

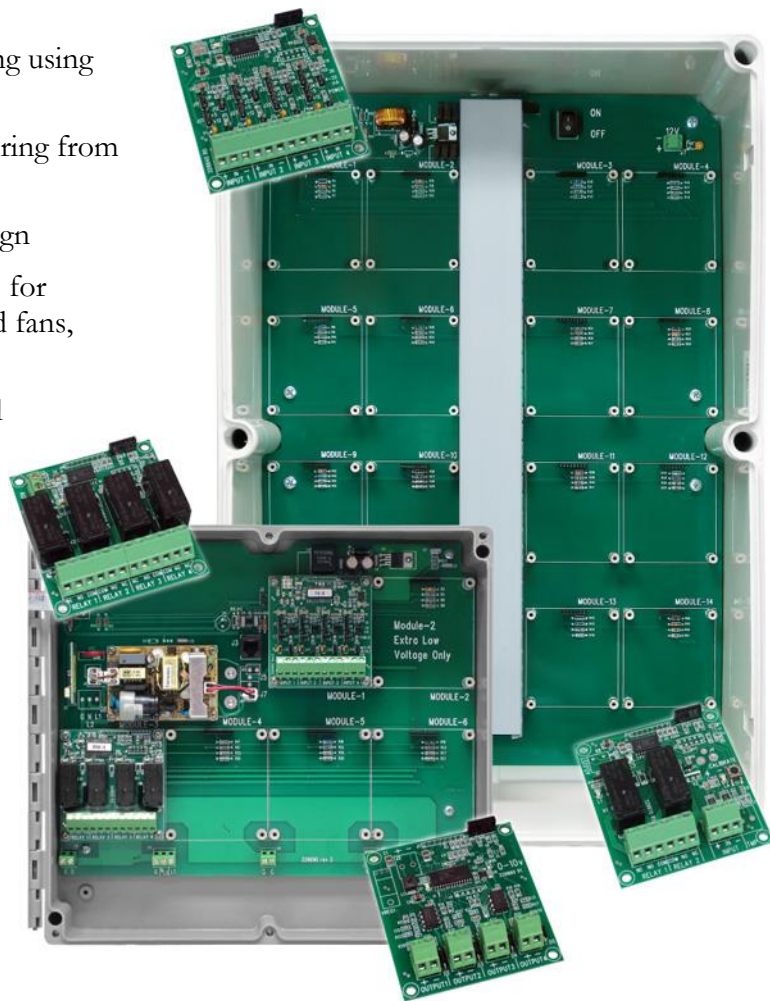
### **Introducing AutoFlex Connect**

AutoFlex Connect brings flexibility and versatility to your fingertips. AutoFlex controls provide an intuitive touchscreen interface at the control. Not at the control? No problem. AutoFlex Connect is accessible from any web-enabled device. No matter where you are, your AutoFlex Connect controls are always within reach.

AutoFlex controls are modular, meaning you have the flexibility to choose only what you need. Choose from modules for sensor monitoring, or for relay, variable AC, or variable DC control. If your needs change, your AutoFlex can easily change.

### **Features**

- ◆ Intuitive user interface
- ◆ Local configuration and monitoring using the 10-inch touchscreen display
- ◆ Remote configuration and monitoring from any web-enabled device
- ◆ Easy expansion with modular design
- ◆ Standard interchangeable modules for control of fixed and variable speed fans, heaters, inlets, and curtains
- ◆ Sixteen available zones for control and monitoring
- ◆ Primary and secondary control modifiers, including:
  - ◆ Temperature
  - ◆ Humidity
  - ◆ Static pressure
  - ◆ Carbon dioxide (CO<sub>2</sub>)
  - ◆ Ammonia (NH<sub>3</sub>)
  - ◆ Light level
  - ◆ THI
  - ◆ Wind speed
  - ◆ Windchill
  - ◆ Rain
- ◆ Limited warranty (2 years)

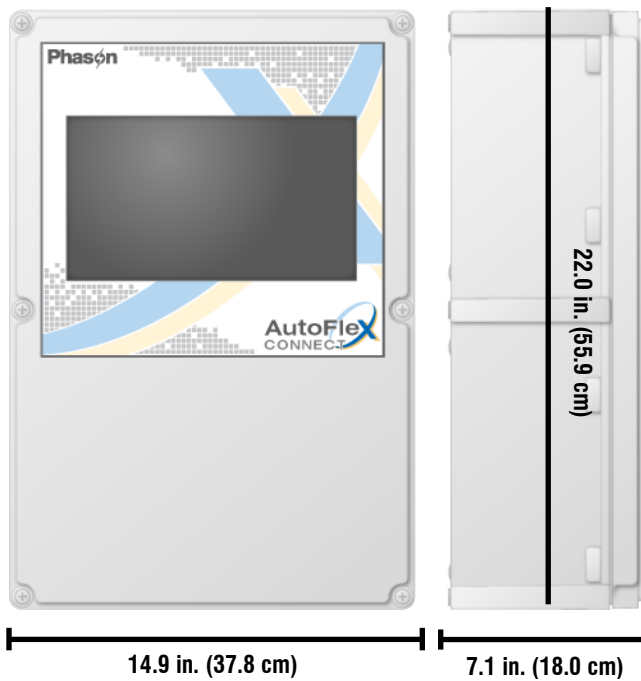


AutoFlex controls are available in two models:

### AutoFlex Connect

Room for 14 modules

NEMA 4X enclosure (22 x 15 x 7 in.)



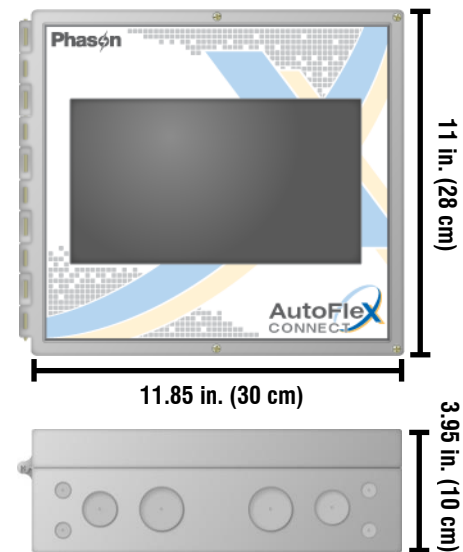
### AutoFlex Connect Mini

Room for 6 modules

NEMA 4X enclosure (11 x 11.85 x 3.95 in.)

Relay Module and Input Module included

Temperature probe (30 feet) included



## Available modules



### Actuator Module (model ACT-1)

The Actuator Module has an open and a close relay for controlling actuators or curtain machines. The Actuator Module includes a potentiometer feedback connection.

For installation information, read **Connecting equipment to Actuator Modules** on page 13.



### Input Module (model IN-4)

The Input Module has connections for four analog sensors.

For installation information and a list of supported sensors, read **Connecting sensors and devices to Input Modules** on page 15.



## CS Relay Module (model RM-2)

The RM-2 Current Sensing Relay Module has two high-capacity, general-purpose relays for controlling fans, heaters, lights, or any other equipment that can be either on or off. Each relay includes a current sensor.

For installation information, read **Connecting equipment to Relay Modules** on page 18.



## Relay Module (model RM-4)

The RM-4 Relay Module has four general-purpose relays. The RM-4 does not have current sensors.

For installation information, read **Connecting equipment to Relay Modules** on page 18.



## Variable AC module (model VAC-1)

The Variable AC Module has one variable output for controlling fans, heat lamps, and heat mats. A temperature probe connector is included for heat mat control. There is also a connection for a Single-Phase Slave.

For installation information, read **Connecting equipment to Variable AC Modules** on page 20.

For information about Single-Phase Slave units, visit [www.phason.ca](http://www.phason.ca).



## Variable DC Module (model VDC-4)

The Variable DC Module has four DC-signal outputs (0 to 10 V) for controlling equipment such as variable frequency drives.

For installation information, read **Connecting equipment to Variable DC Modules** on page 21.



## ***Chapter 2: Installation***

### **What you need to know before installing**



- ◇ If you do not install external surge suppression devices, you risk damage to the electronics inside the control, which may cause the control to fail.
- ◇ Because it is not possible to completely protect this product internally from the effects of power surges and other transients, we highly recommend that you install external surge suppression devices. For specific recommendations, see your electrical contractor.
- ◇ If you do not take these precautions, you acknowledge your willingness to accept the risk of loss or injury.
- ◇ You can connect more than one piece of equipment to a variable stage or relay as long as they are the same type (for example, two fans) and the total current draw and horsepower does not exceed the relay's limit.
- ◇ The maximum wire gauge for all terminals is 12 AWG, solid or stranded.

### **Understanding power surges and surge suppression**

Power surges can be caused by external influences (outside the barn – for example, lightning or utility distribution problems) or they can be caused internally (inside the barn – for example, starting and stopping inductive loads such as motors).

One of the most common causes of power surges is lightning. When lightning strikes the ground, it produces an enormously powerful electromagnetic field. This field affects nearby power lines, which transmit a surge to any device connected to it, such as lights, computers, or environmental controls like the control. Lightning does not have to actually strike a power line to transmit a surge.

Surge suppression devices offer some protection from power surges. Because it is not possible to internally protect this product completely from the effects of power surges and other transients, Phason highly recommends that you install external surge suppression devices. For specific recommendations, see your electrical contractor. If you do not take these precautions, you acknowledge your willingness to accept the risk of loss or injury.

## Reducing electrical noise using filters

Electrical noise is caused by high voltage transients created when inductive loads, such as power contactors, are switched on or off. The strength of the transients can be over 1000 volts and can vary with the type of equipment and wiring, as well as several other factors.

Symptoms of electrical noise include erratic control operation, cycling inlets, communication problems, and more. However, the effects of electrical noise are not always visible. Over time, electrical noise can cause electronic circuits, relay contacts, and power contactors to deteriorate.

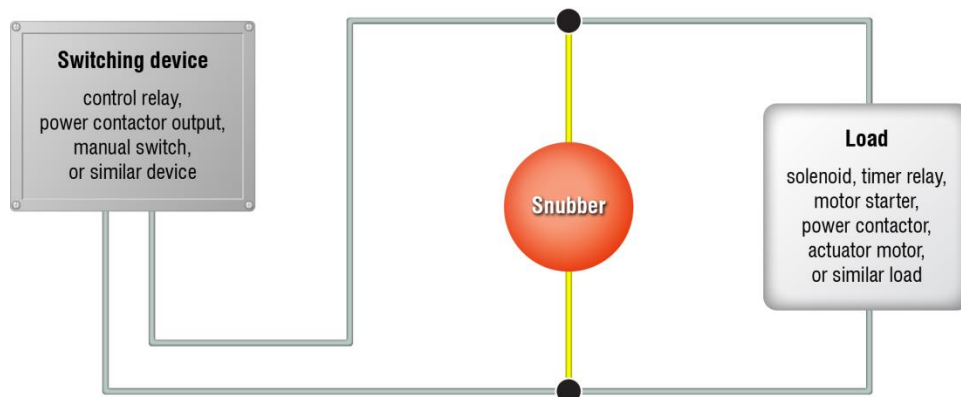
**Phason highly recommends installing filters on all inductive loads.**

## Installing filters helps extend the life of equipment

Filters help prevent electrical noise problems by absorbing the transient energy. Even if you do not have **visible** symptoms of electrical noise, filters help keep controls operating reliably and can extend the life of the controls and equipment connected to them.

Phason's snubber filters (part number 127-0) are for use with solenoids, timer relays, DC motors, furnaces, and other equipment connected to the control's relays. You can also use the filters with loads connected to power contactors.

Install a filter in parallel with the load, as shown in the following example.



- ◇ Do not use Snubber filters with variable stages.
- ◇ Some power contactors include snubber filters. For more information, read **Using power contactors to increase the capacity of relays** on page 9.
- ◇ For more information about snubber filters or other Phason accessories, see your dealer or visit [www.phason.ca](http://www.phason.ca).



## Electrical ratings

- ◆ Control power 85 to 264 VAC, 50/60 Hz
- ◆ Actuator Module 15 A at 120/230 VAC, general-purpose (resistive)  
1/2 HP at 120 VAC, 1 HP at 230 VAC
- ◆ RM-2 Relay Module 20 A at 120/230 VAC, general-purpose (resistive)  
1 HP at 120 VAC, 2 HP at 230 VAC
- ◆ RM-4 Relay Module 15 A at 120/230 VAC, general-purpose (resistive)  
1/2 HP at 120 VAC, 1 HP at 230 VAC
- ◆ Variable AC Module 7 A at 120/230 VAC, general-purpose (resistive)  
4.9 FLA at 120/230 VAC, PSC motor  
1/2 HP at 120 VAC, 1 HP at 230 VAC  
800 W @ 120 VAC, 1600 W @ 230 VAC
- ◆ Variable DC Module 0 to 10 VDC, 2K  $\Omega$  load
- ◆ Alarm relay 0.4 A at 125 VAC; 2 A at 30 VDC, resistive load  
0.2 A at 125 VAC; 1 A at 30 VDC, inductive load

## Using power contactors to increase the capacity of relays

Phason's 240-volt power contactors are heavy-duty relays that allow you to increase the load handling capability of control relays. Power contactors are ideal for secondary ventilation fans and electric heaters.

Phason's power contactor relays have the following electrical ratings.

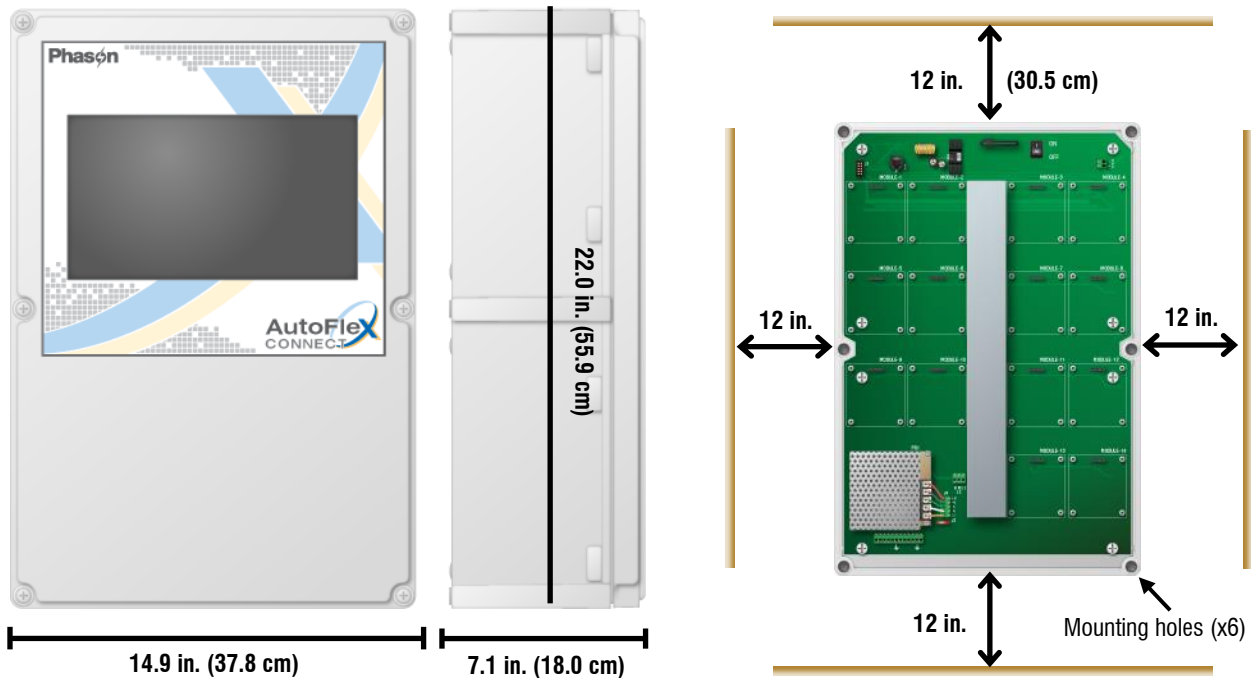
- ◆ Coil 10.2 mA at 240 VAC
- ◆ Contact 25 A at 240 VAC; resistive  
2 HP at 240 VAC, 1 HP at 120 VAC; motor, power factor 0.4  
1300 W at 120 VAC; tungsten

For more information about power contactors, visit [www.phason.ca](http://www.phason.ca).

## Enclosure dimensions and mounting guidelines

- ◆ Mount the control on a sheltered, vertical surface.
- ◆ Mount the control with the electrical knockouts facing down.
- ◆ Mount the control away from sources of moisture and heat.

## AutoFlex

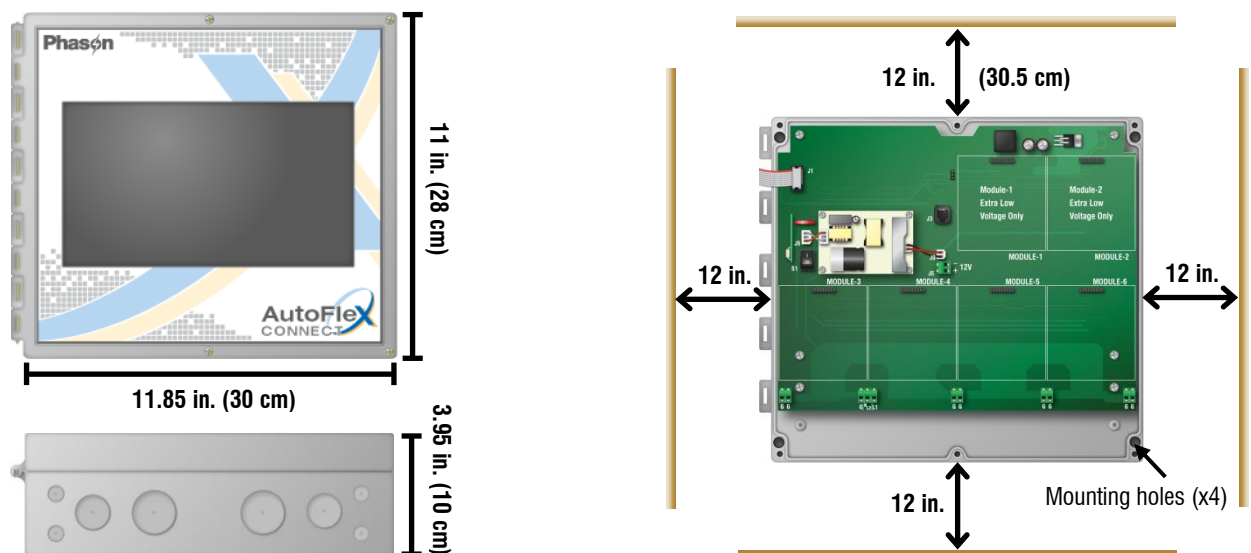


When mounting modules on the bottom board:

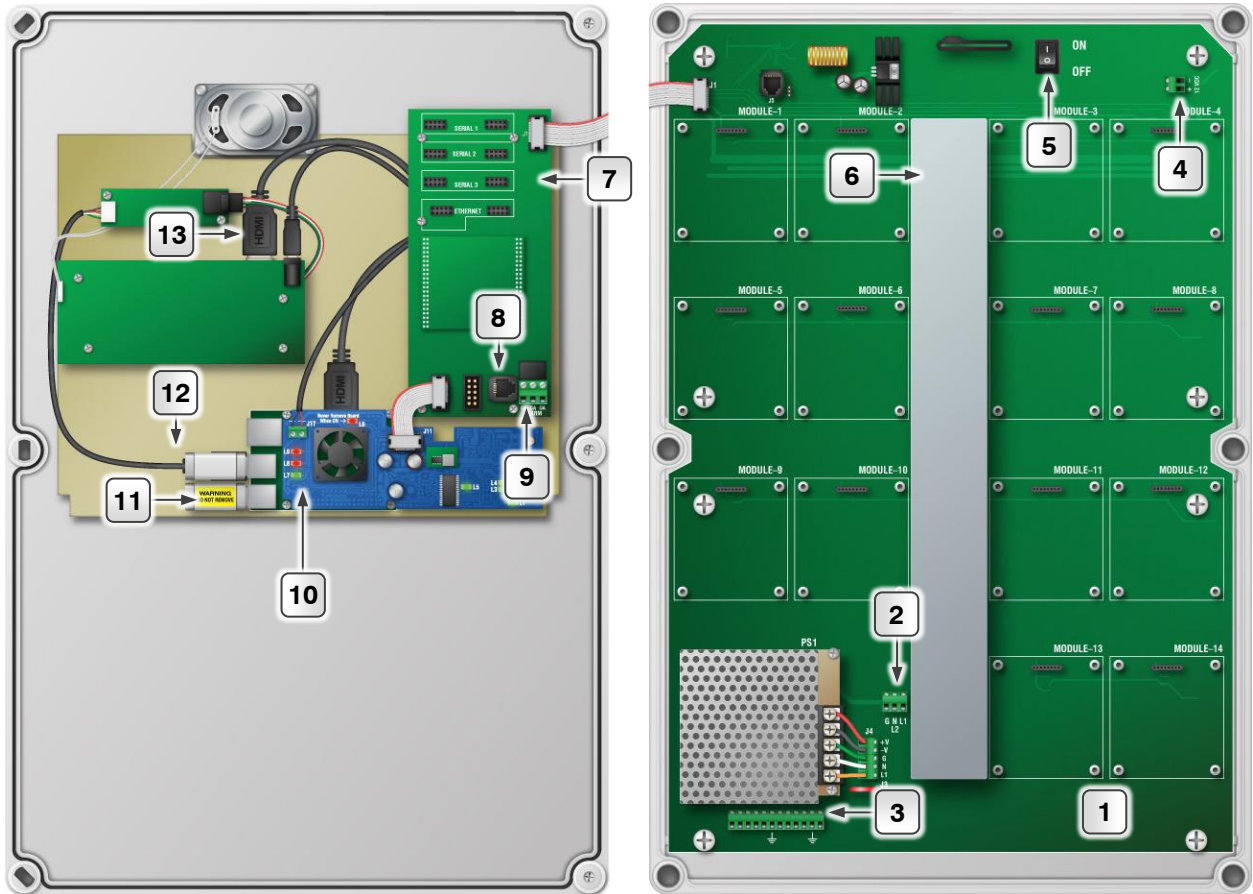


- ◇ Mount high-voltage modules (Relay Modules, Actuator Modules, and Variable AC Modules) next to the trough, and then run the cabling through the trough.
- ◇ Mount low-voltage modules (Input Modules and Variable DC Modules) at the outer positions and run the cabling along the inside of the enclosure.

## AutoFlex Mini

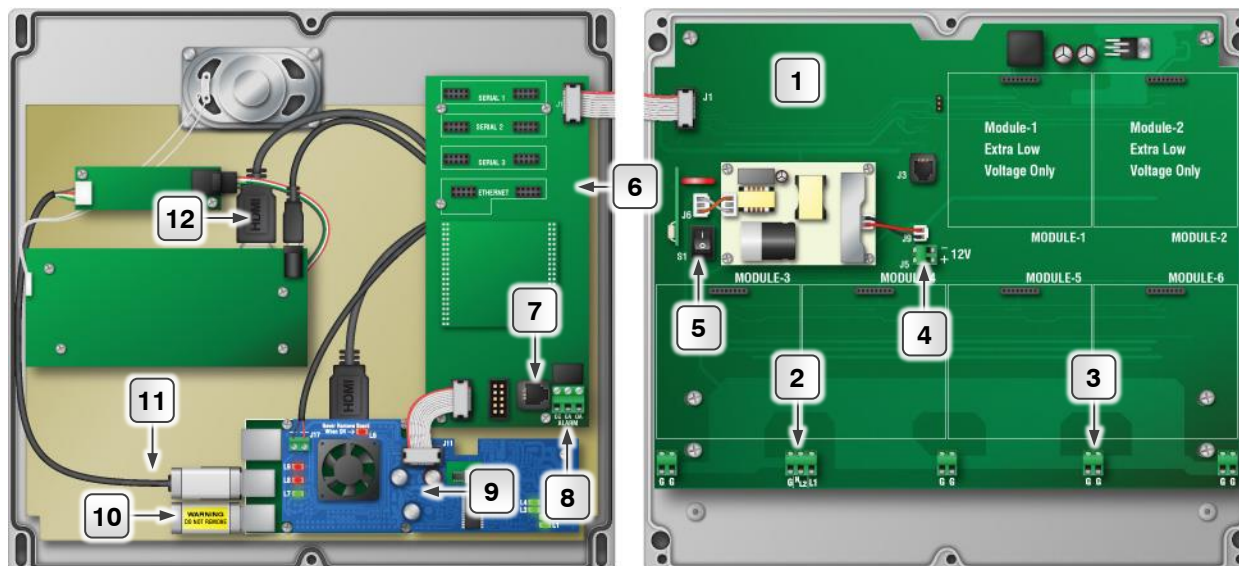


## AutoFlex layout



- 1 **Mounting board:** make sure all module boards, incoming power, and the ribbon cable from the communication controller are properly connected.
- 2 **Incoming power terminal:** connect 120/230 VAC, 50/60 Hz power. See page 24.
- 3 **Ground terminals:** connect any equipment grounds to these terminals. See page 24.
- 4 **12 VDC output terminal:** connect any equipment that requires 12 VDC power, such as iWire radios. You cannot connect VFDs here.
- 5 **ON/OFF switch:** switch the AutoFlex ON or OFF using this switch.
- 6 **Cable trough:** route AC power equipment cables through the trough. Route data and signal cables along the inner walls of the enclosure.
- 7 **Communication controller:** make sure the ribbon cable is connected from the communication controller to the mounting board.
- 8 **Slave cable connection:** connect an optional AutoFlex Slave unit here.
- 9 **Alarm relay terminal:** If you have an external alarm system, connect it here. See page 22.
- 10 **Display controller:** make sure the power supply (top board) is properly connected to the bottom board, and all cables are properly connected.
- 11 **USB drives:** (appearance may vary) make sure the USB drives are properly connected to the USB ports.
- 12 **USB cable:** make sure the cable is properly connected from the display controller to the display board.
- 13 **HDMI cable:** make sure the cable is properly connected from the controller board to the display board.

## AutoFlex Mini layout



## Connecting equipment to modules



- ◇ You can connect more than one piece of equipment to a variable stage or relay as long as they are the same type (for example, two fans) and the total current draw and horsepower does not exceed the relay's limit.
- ◇ The maximum wire gauge for all terminals is 12 AWG, solid or stranded.

## Connecting equipment to Actuator Modules

The Actuator Module (model **ACT-1**) has one OPEN and one CLOSE relay and a connection for potentiometer feedback. You can connect an actuator or a curtain machine to an Actuator Module.



The ratings of the actuator or curtain machine must not exceed the relay ratings of the Actuator Module.

- ◇ 15 A at 120/230 VAC, general-purpose (resistive)
- ◇ 1/2 HP at 120 VAC, 1 HP at 230 VAC

### Actuators

Actuator control is for equipment that opens and closes, and positions to an exact location. For example, inlets can be open between 0 and 100 percent. Actuators use a feedback potentiometer to indicate their position to the control.

### Feedback potentiometers

Each actuator you connect must have a feedback potentiometer. The feedback potentiometer, which you connect to INPUT terminal on the Actuator Module, lets the control know how far the actuator's arm is extended.

Most linear actuators are available with potentiometer feedback and internal adjustable limit switches. A 10,000 ohm, 10-turn feedback potentiometer is preferred, but the internal feedback potentiometer can range between 1000 and 20,000 ohms. Potentiometers outside of this range will affect the precision to which the control can control the actuator.



A system operates more precisely when using the largest amount of stroke that is feasible with the actuator. The stroke is the distance the actuator arm extends or retracts.

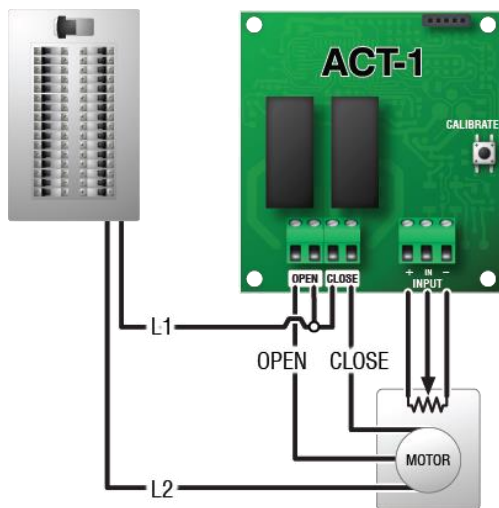
### Curtain machines

Curtains are usually controlled by equipment called curtain machines (sometimes referred to as winches). Curtains are opened and closed to let in more air or less air, the idea being more air cools the building. Curtain machines use a timer and do not have a feedback potentiometer.

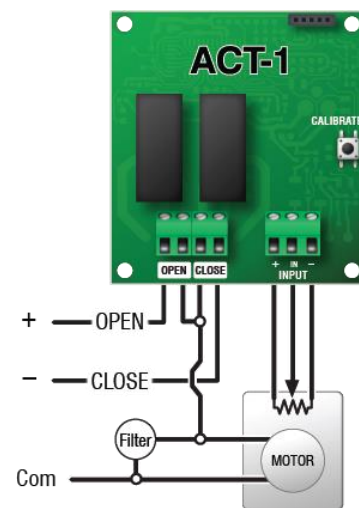
### To connect actuators

1. Connect actuators to the control as shown below. Refer to your actuator's installation guide for information about its power supply requirements.
2. Calibrate the actuator. You can calibrate by pressing the CALIBRATE button, or using the display. For more information the calibration process, and instructions for calibrating using the display, read **Calibrating actuators** on page 39.

**AC powered actuators**



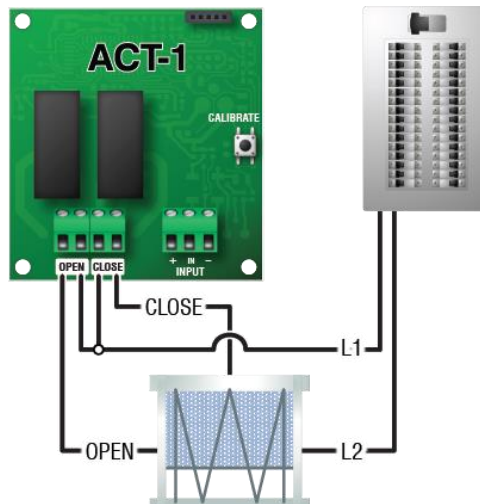
**DC powered actuators**



- ◇ When routing the actuator feedback wires, do not run them in or along the same conduit as AC-power lines.
- ◇ If you are unsure of the potentiometer wiring for your actuator, read **Determining correct actuator feedback wiring** on page 40.
- ◇ If you are measuring AC power with a digital multimeter (DMM) and a limit switch opens the circuit, the DMM measures voltage after the relay switch even if the relay is open.



## To connect curtain machines



## Connecting sensors and devices to Input Modules

The Input Module (model IN-4) has connections for four analog sensors, dry contact switches, or pulse output relays.

### Compatible sensors and devices

#### Phason sensors

- ◇ 3K temperature probes all models
- ◇ Relative Humidity Sensor models RHS and RHS-P
- ◇ Static Pressure Sensor model SPS-2
- ◇ Wind Speed Sensor model WINDSPEED-03
- ◇ Phason Rain Sensor model PRS

#### DOL sensors

- ◇ Temperature and humidity model DOL 114  
*4 - 20 mA version only*
- ◇ Temperature model DOL 15
- ◇ Carbon dioxide (CO2) model DOL 19  
*4 - 20 mA version only*
- ◇ Ammonia (NH3) model DOL 53
- ◇ Light level model DOL 16  
*100/1000 lux version only*

#### Other devices

- ◇ Dry contact pulse output, for example a water meter with pulse output
- ◇ Dry contact digital switch, for example a door contact

### Guidelines for connecting sensors

- ◆ Do not run the sensor cable in the same conduit as AC power cables
- ◆ Do not run the sensor cable beside AC power cables or near electrical equipment.
- ◆ When crossing other cables or power lines, cross them at a 90-degree angle.

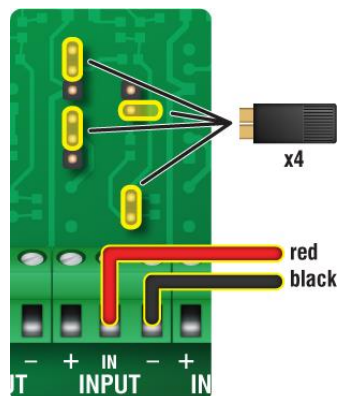


## Wired connections and shunt positions

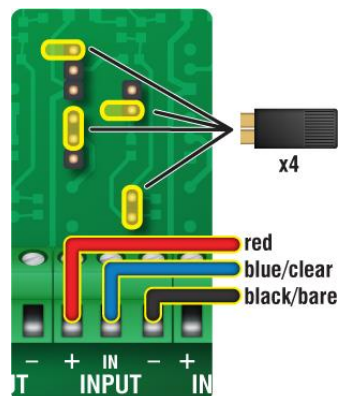
1. Place the shunts in the proper positions for the type of sensor you are connecting. For each sensor, there are four shunts to position.
2. Connect the wiring for the sensor.

### Phason sensors

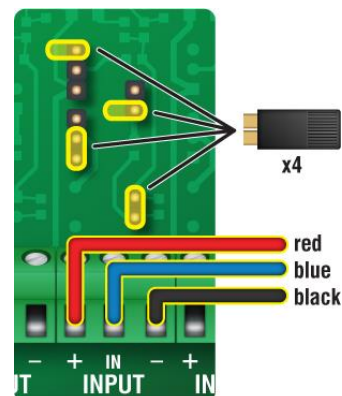
3K temperature probe



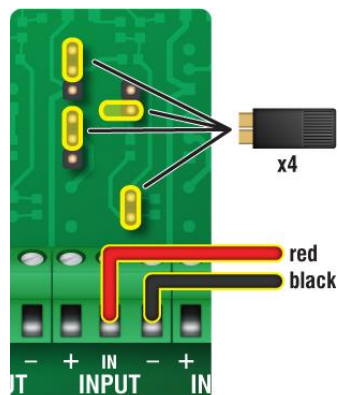
Relative Humidity Sensor



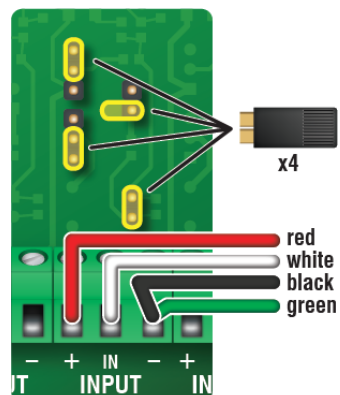
Static Pressure Sensor



Wind Speed Sensor

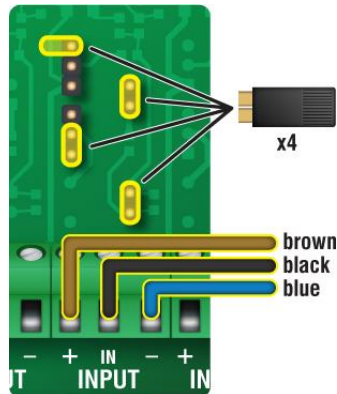


Phason Rain Sensor

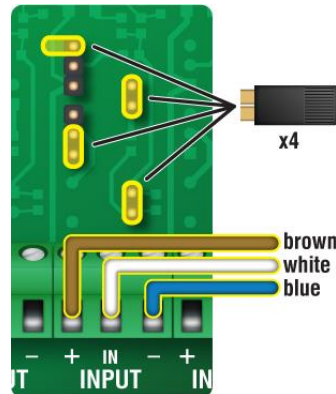


## DOL sensors

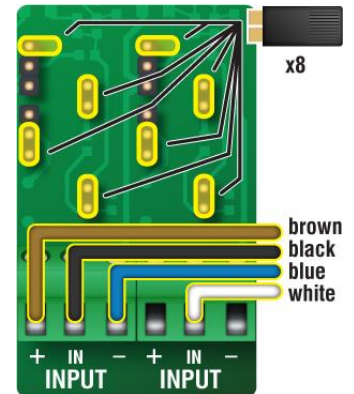
DOL 114 temperature only



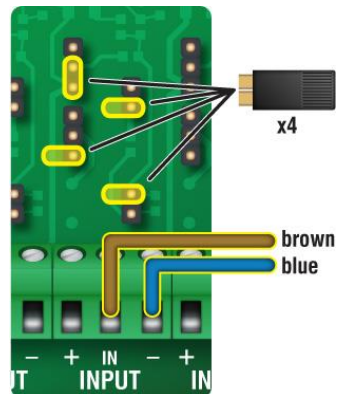
DOL 114 humidity only



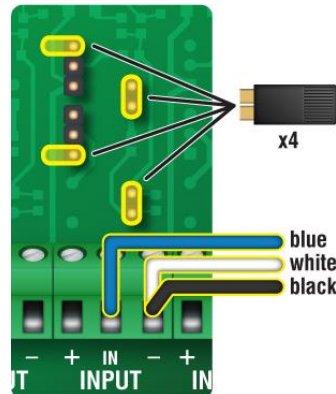
DOL 114 temp. and humidity



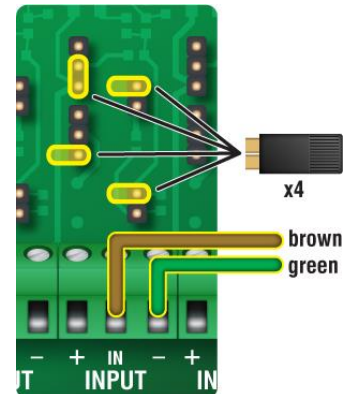
DOL 15 temperature



DOL 19 carbon dioxide (CO2)

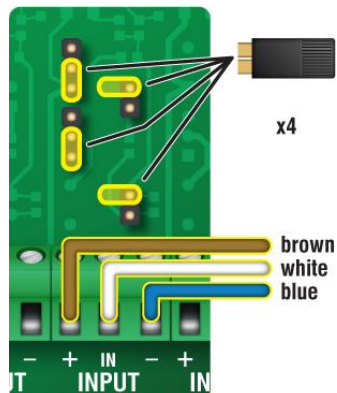


DOL 53 ammonia (NH3)

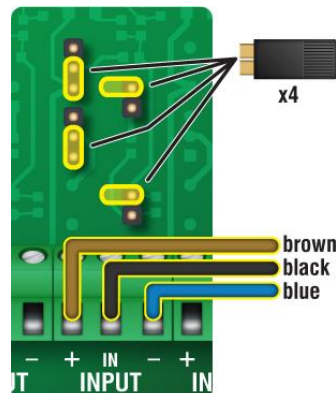


The DOL 19 carbon dioxide and DOL 53 ammonia sensors require external power supplies. For more information, refer to the installation guides for those products.

DOL 16 light sensor, 100 lux

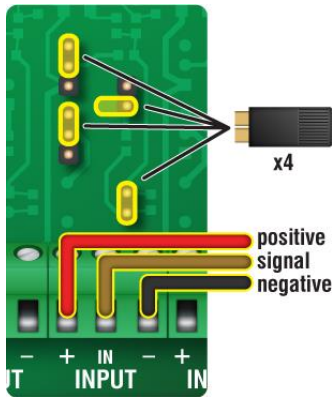


DOL 16 light sensor, 1000 lux

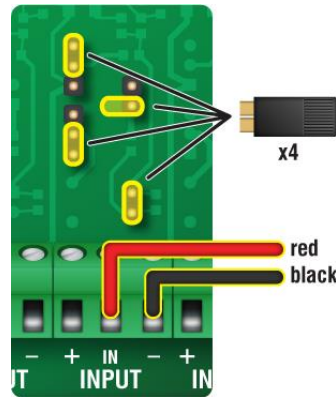


## Other devices

### Dry contact pulse output



### Dry contact digital switch



## Connecting equipment to Relay Modules

Relay Modules have general-purpose relays for connecting equipment that is either on or off. Examples include heaters, furnaces, single-speed fans, and lights. You can also use a relay as a disconnect switch for a 0 to 10 VDC device.

- ◆ The **RM-2** Relay Module has two high-capacity relays. Each relay has a current sensor.
- ◆ The **RM-4** Relay Module has four relays. The RM-4 does not have current sensors.



For curtain machines, read **Connecting equipment to Actuator Modules** on page 13.

The ratings of the equipment you connect must not exceed the ratings of the Relay Module.

#### RM-2

- ◇ 20 A at 120/230 VAC, general-purpose (resistive)
- ◇ 1 HP at 120 VAC, 2 HP at 230 VAC

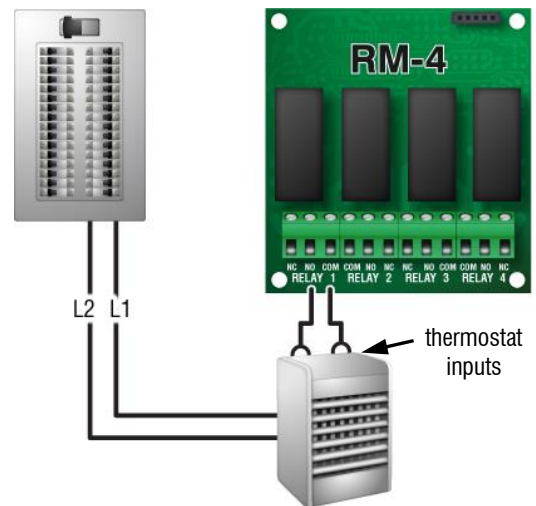
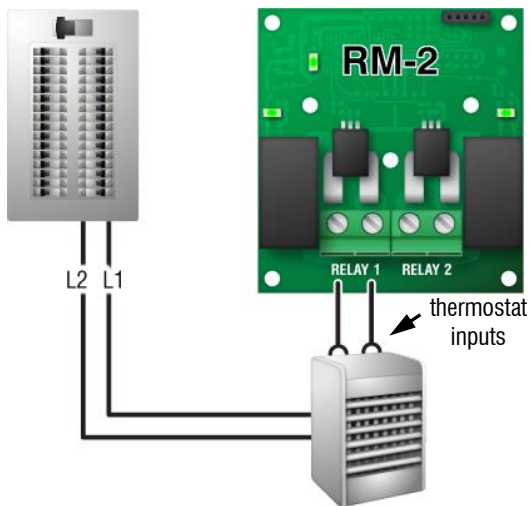
#### RM-4

- ◇ 15 A at 120/230 VAC, general-purpose (resistive)
- ◇ 1/2 HP at 120 VAC, 1 HP at 230 VAC

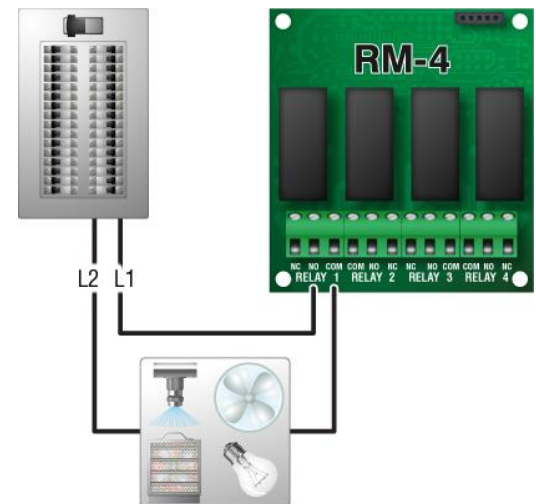
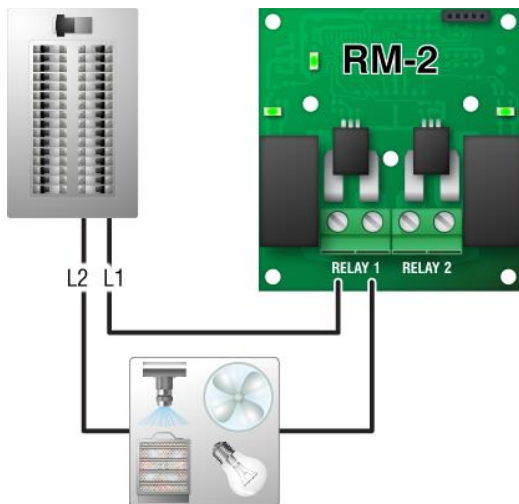
Gas furnaces using hot-surface ignition or glow plugs can draw more current than indicated on their nameplate and require power contactors. For more information, contact your furnace dealer.

## To connect equipment to Relay Modules

### Gas furnaces



### All other equipment



## Connecting equipment to Variable AC Modules

The Variable AC Module has one variable output for controlling fans, heat mats, heat lamps, or similar equipment. A temperature probe connector is included for heat mat control. There is also a connection for a Single-Phase Slave (model PSU-20).

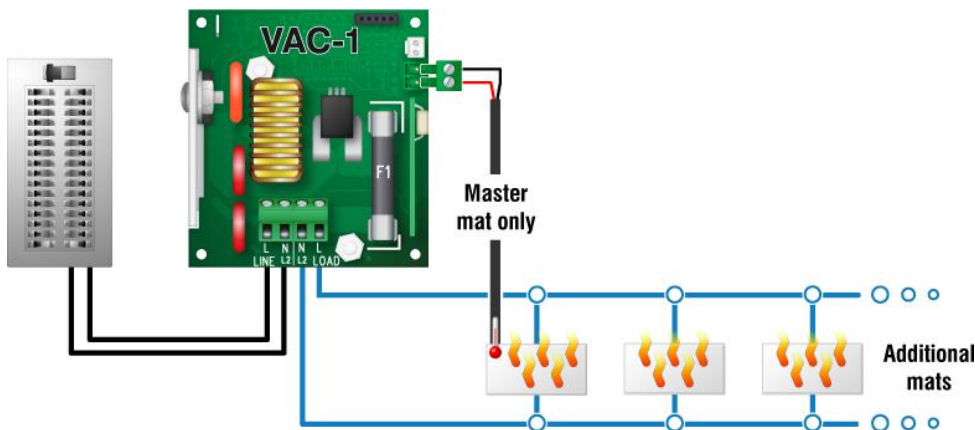


The ratings of the equipment you connect must not exceed the ratings of the Variable AC Module.

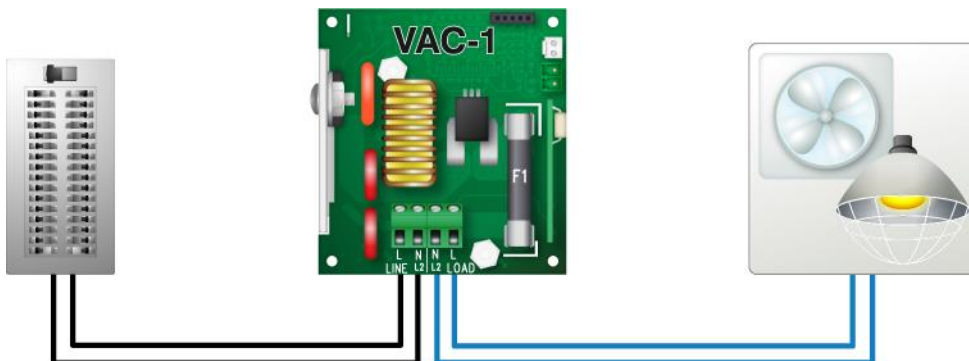
- ◇ 7 A at 120/230 VAC, general-purpose (resistive)
- ◇ 4.9 FLA at 120/230 VAC, PSC motor
- ◇ 1/2 HP at 120 VAC, 1 HP at 230 VAC
- ◇ 800 W at 120 VAC, 1600 W at 230 VAC

### To connect heat mats

When connecting heat mats, you must connect a temperature probe for the master mat.



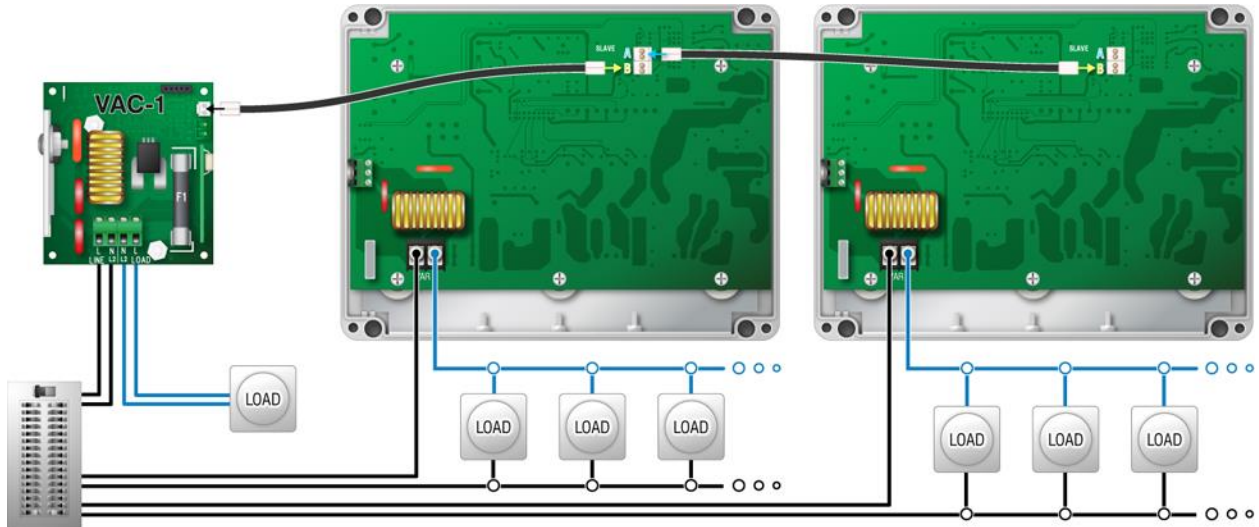
### To connect variable speed fans or heat lamps



## To connect single phase slaves for additional capacity



The VAC-1 and Single-Phase Slave (model PSU-20) **must** be on the same phase.



## Connecting equipment to Variable DC Modules

The Variable DC Module (model **VDC-4**) has four 0 to 10 V outputs for controlling variable frequency drives or FanDRIVES.



The ratings of the equipment you connect must not exceed the ratings of the Variable DC Module.

◇ 0 to 10 VDC, 2K  $\Omega$  load

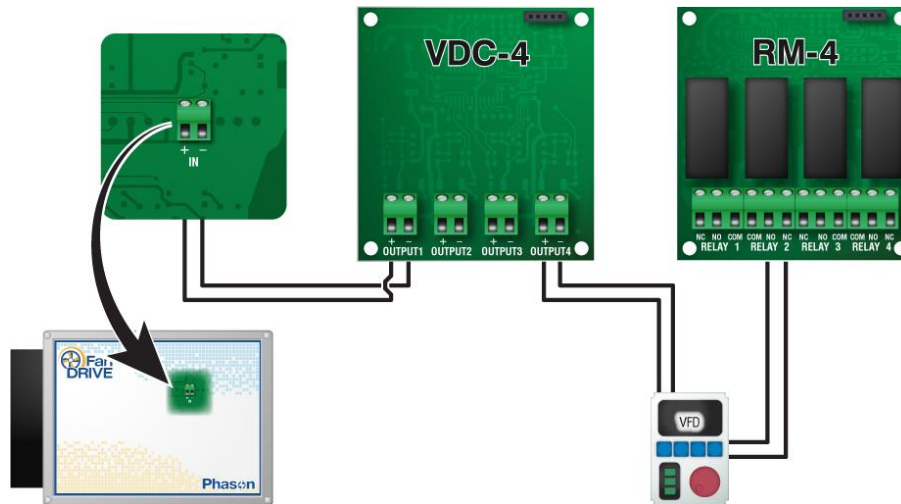
### FanDRIVES

FanDRIVES are for controlling AC variable fans, and are a cost-effective way to increase the capacity of your fan control system. Installation is simple and there is no additional configuration required; FanDRIVES follow the programming of the AutoFlex.

There are two FanDRIVE models available. Model FD-2-7 has two 7 FLA stages, model FD-1-14 has one 14 FLA stage. For more information about FanDRIVES, visit [www.phason.ca](http://www.phason.ca).



## To connect variable frequency drives or FanDRIVES



The disconnect relay for the variable frequency drive is a relay on an RM-4 module. Configure the relay to follow the variable DC output. For more information, refer to the online help at the AutoFlex Connect display.

## Connecting an alarm system

You can connect an alarm system such as a siren or alarm panel to the alarm terminal. Read your alarm system's installation guide for instructions and information about the type of system, **normally open** or **normally closed**. Below are the descriptions for the alarm terminal.

- ◆ **CC:** common connection
- ◆ **CA:** normally open; closes during alarm conditions
- ◆ **OA:** normally closed; opens during alarm conditions



For the alarm system to trigger during an alarm condition, you must configure and enable the alarms at the display.





The ratings of the alarm system must not exceed the ratings of the alarm relay.

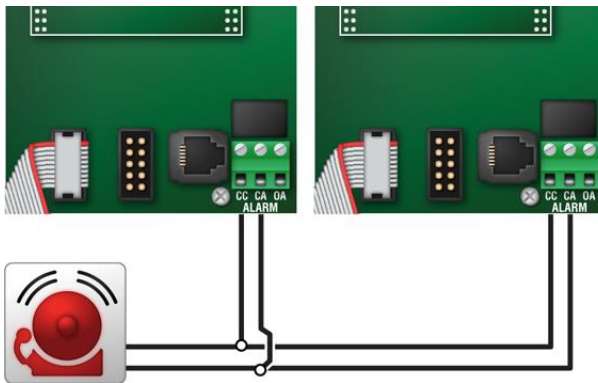
- ◇ 0.4 A at 125 VAC; 2 A at 30 VDC, resistive load
- ◇ 0.2 A at 125 VAC; 1 A at 30 VDC, inductive load

### To connect a normally open alarm system

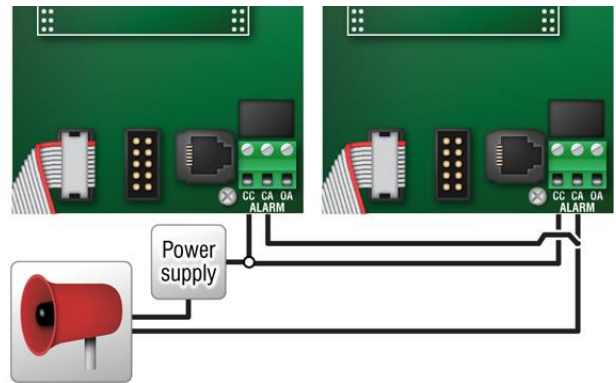
If you are connecting the alarm system to multiple AutoFlex controls and your system uses a **normally open** connection (closes on alarm), connect the system as shown in the normally open diagram.

Join all the **CC** connections together and all the **CA** connections together. The AutoFlex alarm relays must be in parallel with each other so any AutoFlex can trigger the alarm system when an alarm condition occurs.

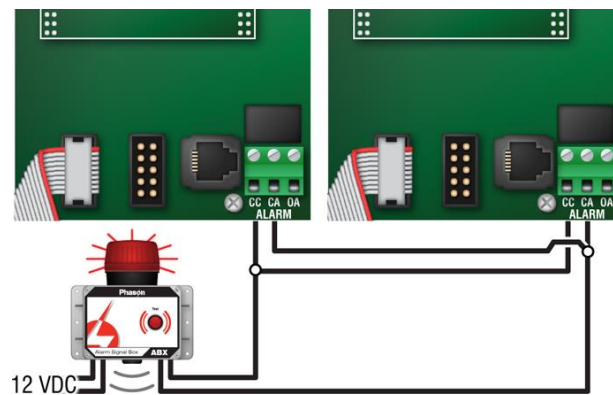
#### Autodialer or similar alarm system



#### Alarm light or siren



#### Phason Alarm Box

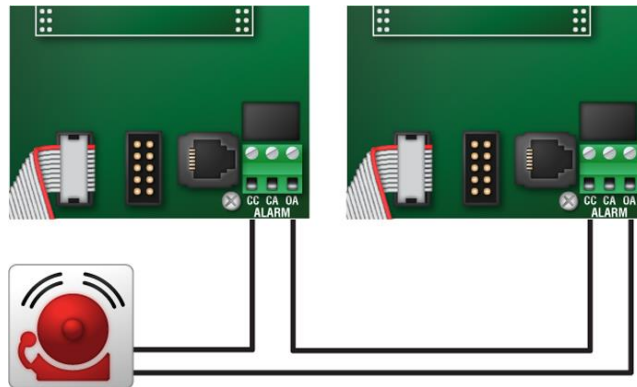


### To connect a normally closed alarm system

If you are connecting the alarm system to multiple AutoFlex controls and your system uses a **normally closed** connection (opens on alarm), connect the system as shown in the normally closed diagram.

Join the alarm relays in a continuous loop. The AutoFlex alarm relays must be in series with each other so any AutoFlex can trigger the alarm system when an alarm condition occurs.

#### Autodialer or similar alarm system



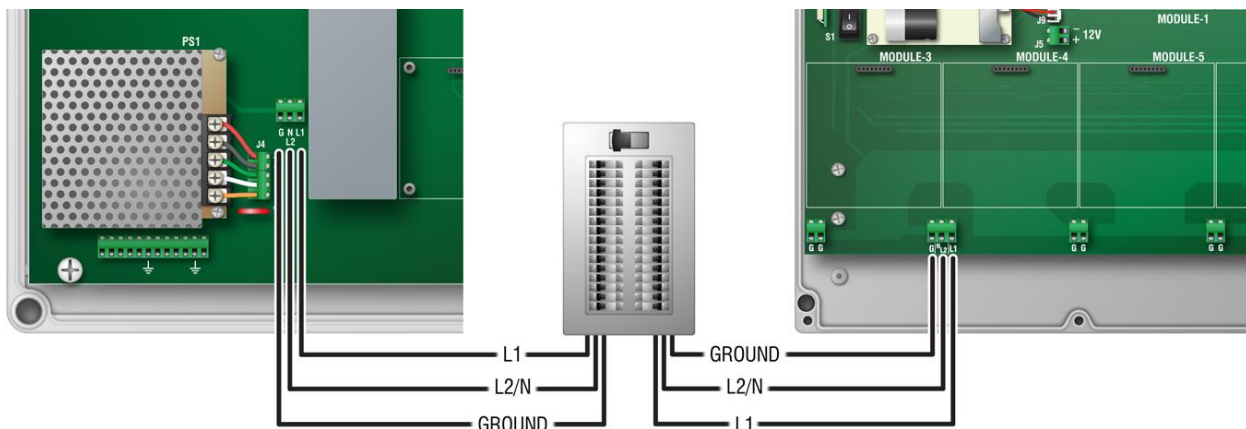
### Connecting the power source



- ◇ Before connecting the incoming power, switch OFF the power at the source.
- ◇ Do not switch ON the power until you have finished all wiring and verified all equipment is properly connected and free of obstructions.

### To connect the incoming power source

You can connect the control to 85 to 264 VAC, 50 or 60 Hz power.



## Finishing the installation

After installing and connecting equipment to the AutoFlex control, you are ready to finish the installation. Before you start configuring the control, you need to verify the connections and close the control. After you have finished connecting all equipment and wiring:

1. Make sure all the wires are properly connected to the correct terminals.
2. Make sure all cables are properly connected. For more information, see the diagram on page 11.
3. Close the cover.
4. Switch on the power to the control.  
When you switch on the power to the control, AutoFlex goes through its startup process. If the control display does not come on, go back to step 1.

## ***Chapter 3: Network configuration***

AutoFlex Connect can be networked in several ways. Here are some things to think about before deciding the type of network.

- ◆ Do you need to monitor your AutoFlex Connect remotely? If yes, do you want to monitor from on-site (within the building) or off-site (outside of the building or off the facility)?
- ◆ Do you want use traditional wired Ethernet for networking, or do you prefer the flexibility of wireless networking (Wi-Fi)?

After you have answered these questions, you can follow the guidelines to configure your AutoFlex Connect for remote access.



AutoFlex Connect is password-protected to provide enhanced security, regardless of your network setup.

## **Remote access**

Remote access allows you to easily monitor and control your AutoFlex Connect from anywhere within your facility, or optionally from anywhere in the world, on any device including a desktop computer, laptop, tablet, or smartphone.

If you need remote access, you need a router installed on your site. Remote access within your facility is the easiest to setup and does not require an Internet connection. If you want to access your AutoFlex Connect from outside your facility, you need an Internet connection at your site and AutoFlex Connect needs to open some ports on your router.

For easy and fully-automatic router configuration, AutoFlex Connect comes with a built-in networking feature called **Universal Plug and Play** (UPnP). UPnP is a networking protocol that devices can use to automatically discover other devices on your network and then open ports on your router to allow you access them from outside of your network. UPnP is commonly used by network devices such as printers, home theater devices, media players, and gaming consoles such as Xbox and PlayStation.

UPnP is a technological advancement to give users the convenience of automatic network setup and configuration. However, if not monitored properly, it could be vulnerable to network security as any other computer would be from a virus. It is your responsibility to protect your network in the same way you would protect your computers from viruses.

If you are concerned about the security of your network and reluctant to use UPnP, Phason recommends you use one of the other networking methods for off-site remote access. These other networking methods are more secure, but require more-advanced skills and manual configuration of the router. For more information, see **Networking options** below.

## UPnP security tips

- ◆ Install a newer-model, name-brand router. There are many reputable brands, and newer models provide better security.
- ◆ Keep your router's firmware up to date. Most routers have the ability to update the firmware. Phason suggests updating the firmware before installing, and then checking regularly for updates.
- ◆ Do not connect other devices to the same network that contains your important information.
- ◆ Configure your router firewall to accept incoming traffic from only known IP addresses and reject everything else.

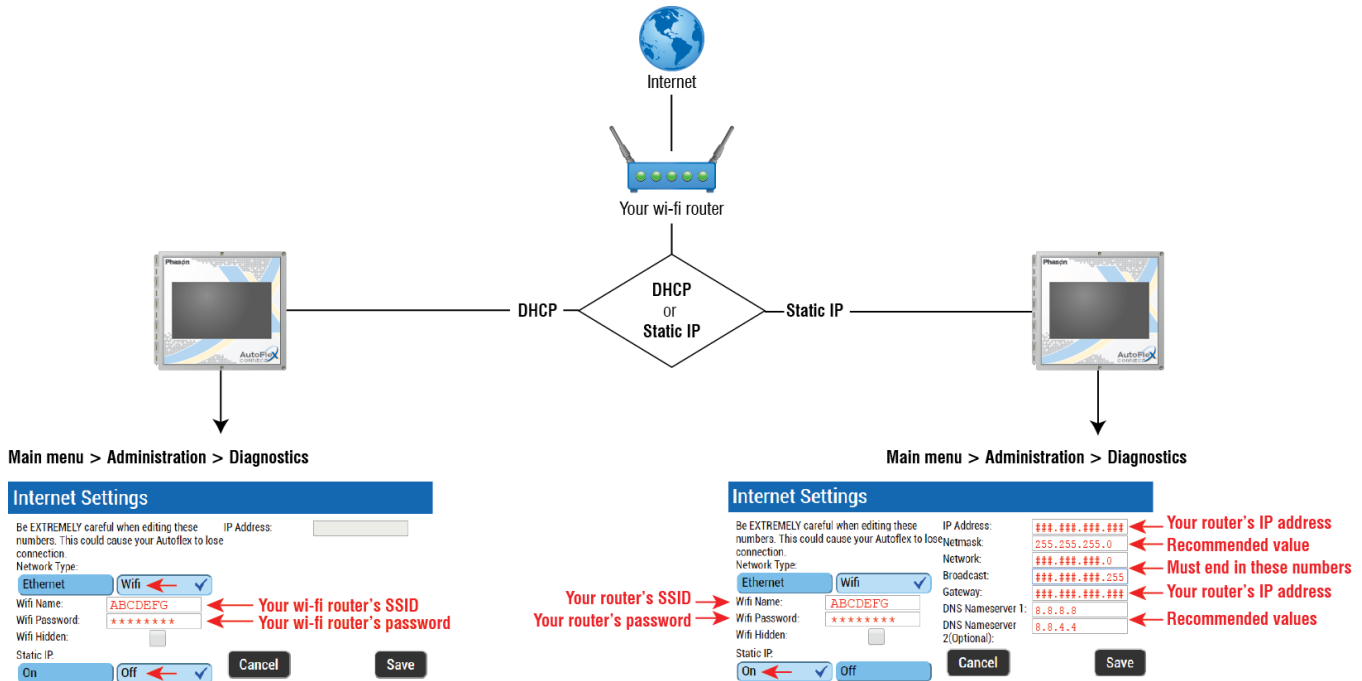
## Networking options

Phason recommends the following ways for networking your AutoFlex Connect. They are listed in order of preference.

Access type	Network requirements	Router configuration	Ease of setup	Security risk
On-site only	<ul style="list-style-type: none"> <li>◇ No Internet required</li> <li>◇ <b>No port forwarding</b> required</li> </ul>	Minimum to none	Extremely easy	Very low
On-site and off-site	<ul style="list-style-type: none"> <li>◇ Internet required</li> <li>◇ <b>UPnP</b> (Universal Plug and Play) compatible router required</li> </ul>	Minimum	Easy	High
On-site and off-site	<ul style="list-style-type: none"> <li>◇ Internet required</li> <li>◇ <b>Manual port forwarding</b>/firewall configuration required</li> </ul>	Advanced	Moderate to advanced	Low
On-site and off-site	<ul style="list-style-type: none"> <li>◇ Internet required</li> <li>◇ No port forwarding required</li> <li>◇ On-site computer running <b>TeamViewer</b> (or similar remote access software) required</li> </ul>	Minimum to none	Easy	Very low

## IP addressing: DHCP or static IP

Both on-site and off-site access require AutoFlex Connect to have an IP address. The following diagram shows examples for DHCP and static IP addresses using Wi-Fi. If you are using wired networking, select Ethernet instead of Wi-Fi.



### Notes for IP addressing

1. Choose your network configuration, **DHCP** or **STATIC** addressing
2. If your router has DHCP enabled, no settings are required in the AutoFlex Connect. If your setup is using STATIC addressing, you need to assign a new **STATIC IP address** for your AutoFlex Connect unit in the router.
3. After powering on the AutoFlex Connect, go to the Network Settings page and then choose the type of network connection, **Wi-Fi** or **Ethernet**. For Wi-Fi, enter the **SSID** and **Password**.
4. After you have entered all information, press **Save**. The control will reboot and should connect to your network.



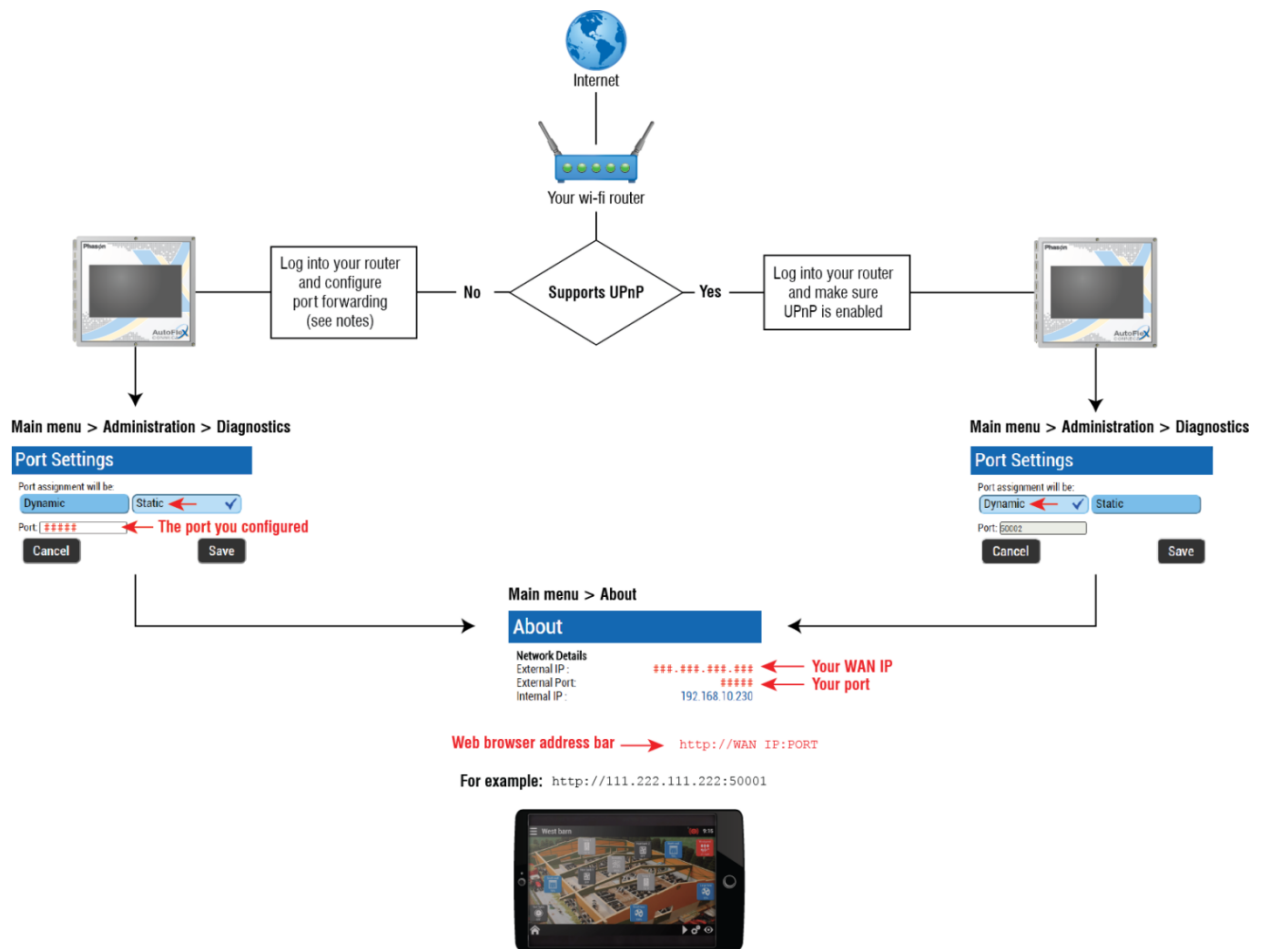
- ◇ If you are configuring for **on-site access only**, your configuration is complete.
- ◇ If you are configuring for **off-site access using TeamViewer** (or similar remote software), your configuration is complete.
- ◇ If you are configuring for **off-site access using port forwarding**, continue to next section.

## Port forwarding: UPnP or manual forwarding

Off-site access requires port forwarding. If you are configuring for on-site access only, you do not need to configure this section.



There is a section called **Appendix D: Understanding port forwarding** at the back of this guide that explains in detail how port forwarding works, why you need to use it, and things to consider before you configure your router. *Phason highly recommends reading the section before continuing.*



### Notes for forwarding *with* UPnP

1. Make sure **UPnP** is enabled on the router. Most UPnP routers have this option enabled by default.
2. Once, the unit is connected to the network, go to **Administration → Diagnostics → Port Settings** and then Select **Dynamic** and then press **Save**. Wait for AutoFlex Connect to configure your router and confirm success.



3. If everything is good, AutoFlex should have automatically opened the appropriate ports on your router. Verify this in the About screen. In the Main menu, press **About**.
4. Write down the WAN IP and Port of your AutoFlex Connect unit displayed in the About screen.
5. Open a web browser on any web-connected device and then type the following in the address bar: `http://<WAN IP>:<AutoFlex Connect PORT>`  
You should now see the screen of your AutoFlex Connect in your browser.

### Notes for manual forwarding (no UPnP)

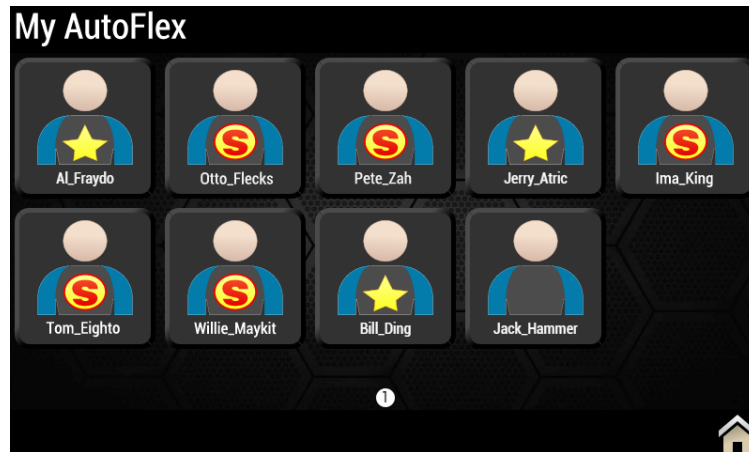
1. Log into your router and find the **port forwarding** option.
2. Choose a port number between 50001 and 50500.
3. Add a new port forwarding entry with the port of you chose. Add a second port with the same port starting with **6**. For example, if you choose port 50001, then add a second port forwarding entry as 60001.  
Your router may restart for the changes to take effect. Most routers will expect the following data:
  - ◆ **Device Internal IP Address (LAN)**  
(Put here the LAN IP address of AutoFlex Connect Unit or choose your device from the connected-devices list in the Router)
  - ◆ **Device Internal Port or Port Range**  
(Put here the port you chose above for both the options)
  - ◆ **Device External Port or Port Range**  
(Put here the port you chose above for both the options)
  - ◆ **Friendly Name**  
(Put here any name you like which is easy for you to recognize your AutoFlex Unit)
  - ◆ **Protocol**  
(Choose the **TCP/IP** option)
4. After the port forwarding has been setup on your Router, setup the same port on your AutoFlex Connect unit.
5. Once, the unit is connected to the network, goto **Administration → Diagnostics → Port Settings** and then Select “**Static**” and then **type in the same port that you forwarded on the Router** and then click “**Save**”. Wait for AutoFlex Connect to configure your Router and confirm success.
6. If everything is good, the unit should have automatically setup the port setting, which can be verified from the “**About**” screen.
7. Note down the **WAN IP** and **Port** of your AutoFlex Connect unit from the “**About**” screen.
8. Open a browser and type the following URL in your address bar:  
`http://<WAN IP>:<AutoFlex Connect PORT>`  
You should now see the screen of your AutoFlex Connect unit in your browser.

## ***Chapter 4: Getting started***

This chapter is a brief and general overview to help you get started and move around AutoFlex Connect. For more specific and detailed help, press the help icon [ ? ] on any of the screens.

### **Logging in**

- ◆ The login screen shows all available users. At first, only the **sysadmin** user exists.
- ◆ Press on a user to log into AutoFlex Connect.
- ◆ Users must enter their PIN number to access the system



## Getting around

- ◆ The main menu [ ≡ ] allows you to access all the screens required to set up the control
- ◆ The home icon [ 🏠 ] takes you to the Home screen
- ◆ The green arrows move forward and backward through screens.



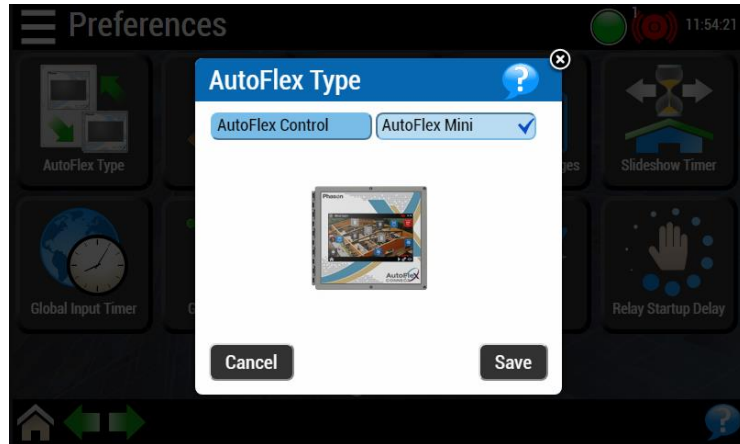
## Create users

1. Use the menu to go to the Administration page, and then press **Users**.
2. Press **+** and then add users by creating a new user account or adding from an existing account.

A screenshot of the 'Create User' form within the Phason control interface. The background shows a 'Users' screen with three user cards: 'Otto Flecks', 'Elle Viss', and 'Brooke Trout'. The 'Create User' form is a modal window with a blue header and a close button (X) in the top right corner. It contains two columns of input fields: 'First Name', 'Last Name', 'PIN', 'Repeat PIN', 'E-mail', 'Phone Number', 'City', 'Country', 'Province', 'Box Number', 'Street', and 'Postal/Zip Code'. Below these fields is an 'Access Level' section with three radio buttons: 'Administrator' (selected), 'Manager', and 'View Only'. At the bottom of the form are two buttons: 'Cancel' and 'Create'.

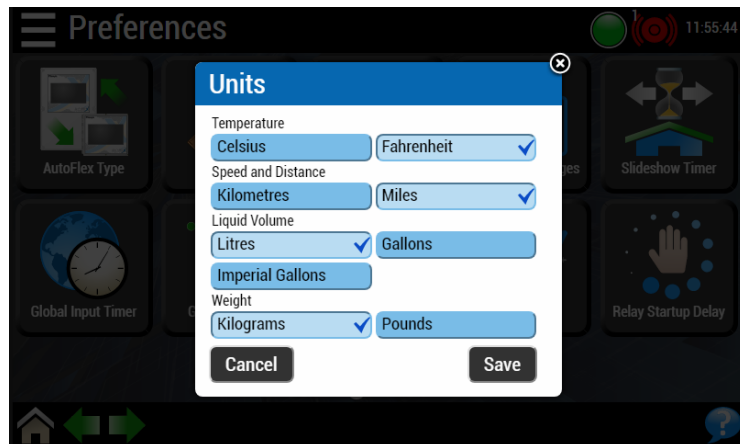
## Select the AutoFlex type

At the Administration page, press **Preferences** and then **AutoFlex Type**.



## Select the units of measure

At the Preferences page, press **Units**.




## Creating zones

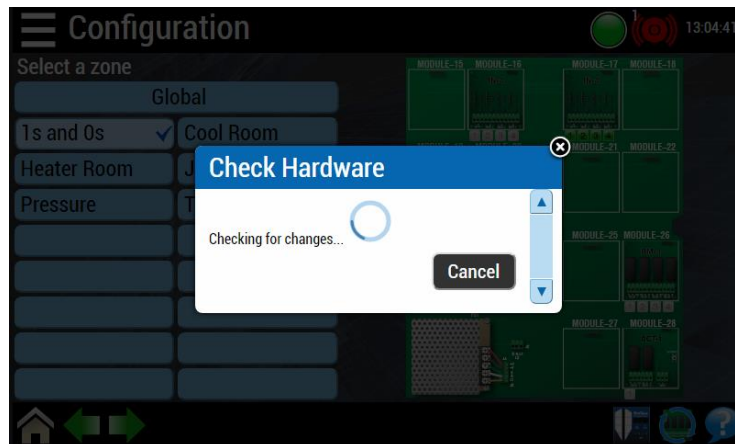
Zones are how you group equipment that is controlled together.

1. Use the menu to go to the Zones page.
2. Press +.



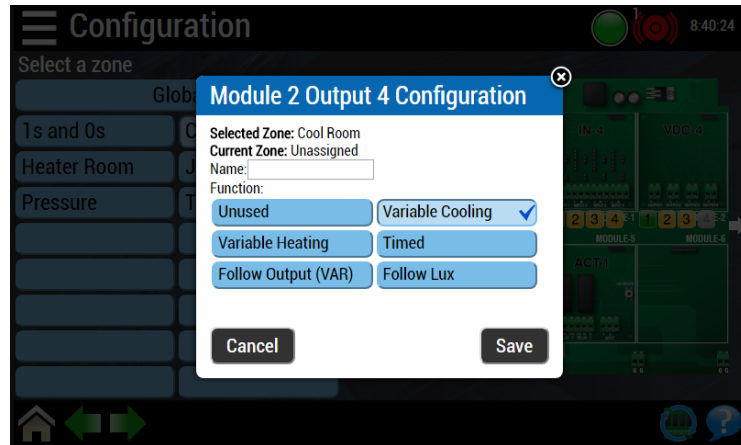
## Checking for modules

- ◆ Use the menu to go to the Configuration page.
- ◆ Press the refresh hardware icon [  ] to check for new modules.



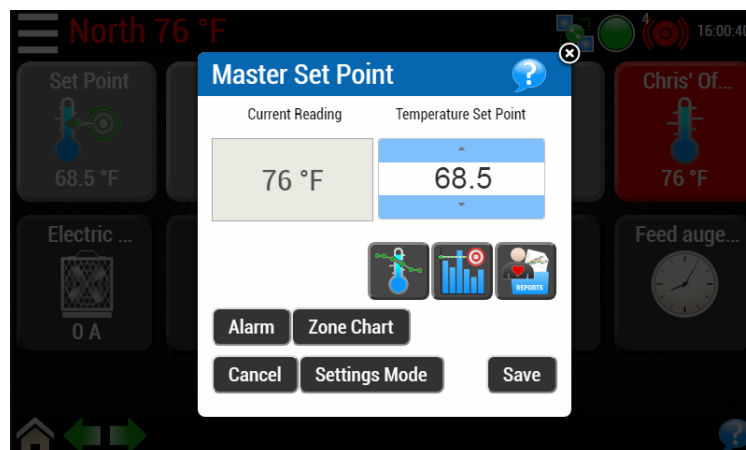
## Assigning hardware to zones

1. At the Configuration page, select a zone to assign the hardware to.
2. Press the module with the hardware you want to assign.
3. Press the number for the input/output.




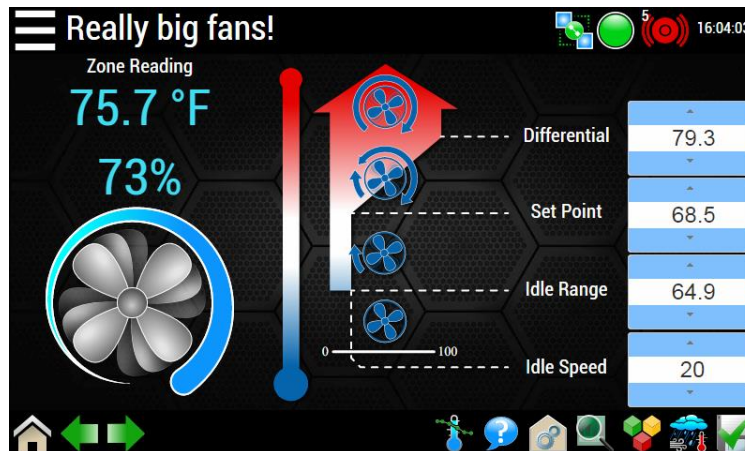
## Adjusting the zone set point

1. Use the menu to go to the Zones page.
2. Press one of the zones.
3. Press the Set Point icon.







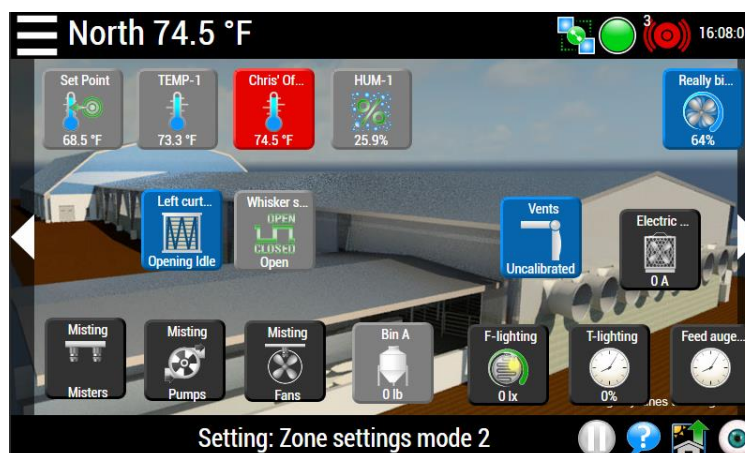
## Adjusting equipment settings

1. At the Zones page, press one of the zones.
2. Press one of the equipment icons.
3. Press the settings icon [  ].



## Using the Home page

- ◆ The Home page is a scrolling status screen. Each zone has its own page. Press the arrows to change pages.
- ◆ You can pause [  ] or cycle [  ] through zones.
- ◆ You can select from included backgrounds, or press the upload icon [  ] to choose your own.
- ◆ You can drag equipment icons to arrange them.
- ◆ You can press the alarm icon [  ] when it is red to view any alarm conditions. A number above the icon indicates how many alarm conditions there are.





## Appendixes

### Appendix A: Troubleshooting

The following table lists some problems, possible causes, and possible solutions. If you are having a problem with your AutoFlex, see if the problem is described in the table, and then follow the instructions for correcting the problem.



Some solutions in the Troubleshooting table refer to repair kits. For more information about kits, read **Appendix C: Additional modules and repair kits** on page 41.

Problem(s)	Possible cause(s)	Possible solution(s)
<b>Modules</b>		
Relay does not switch load on	Incorrect wiring	Correct the wiring. For more information, read the installation section for the specific type of equipment and module.
	No power to the load	Switch on the power or reset the breaker.
	Faulty equipment	Replace the equipment.
	Blown relay	Solve the problem that caused the relay to blow and then replace the module with a kit.
A curtain opens when it should close, or closes when it should open.	The wiring is incorrect; the close and open wires are reversed.	Correct the wiring. For more information, read <b>Connecting equipment to Actuator Modules</b> on page 13.
<b>General</b>		
There is no display, no LEDs light up.	There is no power to the AutoFlex.	Switch on the power or reset the breaker.
	The input power is incorrect.	Measure the incoming AC voltage. The voltage must be 85 to 264 VAC, 50/60 Hz.
	The power supply is damaged.	If input voltage is correct, replace power supply with the correct kit.
There is no display, but power to the rest of the control.	The HDMI cable is loose or disconnected.	Reconnect the cable. For more information, see <b>AutoFlex layout</b> on page 11.
	The ribbon cables are disconnected.	Connect all ribbon cables. For more information, see <b>AutoFlex layout</b> on page 11.
	The display controller is damaged.	Replace the controller board with kit KDISPLAY-CTRL.

Problem(s)	Possible cause(s)	Possible solution(s)
Nothing happens when screen is pressed.	<p>The USB cable is loose or disconnected.</p> <p>The ribbon cables are disconnected.</p> <p>The display controller is damaged.</p>	<p>Reconnect the cable. For more information, see <b>AutoFlex layout</b> on page 11.</p> <p>Connect all ribbon cables. For more information, see <b>AutoFlex layout</b> on page 11.</p> <p>Replace the controller board with kit KDISPLAY-CTRL.</p>
Controller board LED L1 (green) is not on and/or bottom board LED PWR (red) is not on.	<p>The ribbon cables are disconnected.</p> <p>There is no power to the board.</p> <p>The display controller is damaged.</p>	<p>Connect all ribbon cables. For more information, see <b>AutoFlex layout</b> on page 11.</p> <p>Confirm the input power to the Autoflex is connected.</p> <p>Replace the controller board with kit KDISPLAY-CTRL.</p>
<p>Power supply components are blown out.</p> <p>There are burned marks on boards and components.</p> <p>Motors and fans slow down or stop.</p>	There is/was a power surge, brownout, or power outage.	<p>Avoid the problem in future by providing proper voltage and protection for the control.</p> <p>Replace any damaged circuit boards with a kit.</p>
Alarm relay not operating alarm system	The wiring is incorrect	Correct the wiring. For more information, read <b>Connecting an alarm system</b> on page 22.

## Appendix B: Calibrating and troubleshooting actuators

### Calibrating actuators

After configuring the actuator relays, you need to calibrate the actuators. Calibrating the actuator lets the control know the position of the actuator when it is fully extended and fully retracted. The control uses the limits to define the range of motion it uses to position the inlets. These limits tell the control how much to adjust when you want the actuators, for example, only 25% extended.

Because cables can stretch and equipment can come out of alignment (similar to tires on your car), we recommend resetting the limit switches and calibrating your actuators at least once each year.

During calibration, the actuator opens, pauses, and then closes. If the actuator is operating properly, the inlet should open completely and then close completely. After closing completely, the actuators should position according to the temperature and default settings.



- ◇ Before calibrating actuators, make sure the limit switches are set and the cable and counter weights can move freely.
- ◇ If the calibration procedure stops after closing the first time, or fails to position properly, the feedback signal is not connected properly. Verify that the potentiometer wiring is correct. For more information, read **Determining correct actuator feedback wiring** on page 40.

## Determining correct actuator feedback wiring

After installing a new actuator or potentiometer, or due to age-related potentiometer wear, the actuator might not move correctly. Common symptoms include:

- ◆ The actuator oscillating back and forth
- ◆ The actuator not traveling the full stroke during calibration

The feedback potentiometer wiring must be properly connected to the control. Determining the correct wiring can be difficult on some actuators or potentiometers.

Potentiometers have three wires: positive (+), negative (–), and feedback (FB). If the feedback wire is not connected to the FB terminal on the control, the actuator will not function properly.

Because the wires are often different colors and are not always labeled the same as above, measuring the resistance between the wires is the best way to determine which wire is the feedback wire. Follow the steps below to measure the resistance and determine the correct wiring.


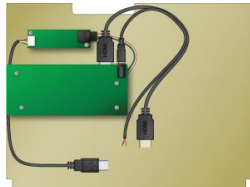

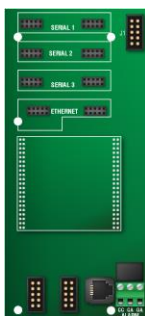
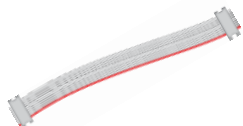
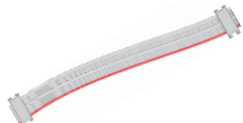
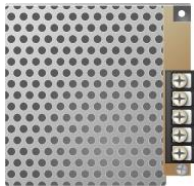
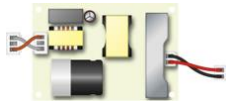

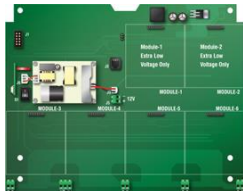








**Before checking the potentiometer wires, verify that the power wires are properly connected.**

1. Manually move the actuator away from the end of its stroke by at least a quarter of its total stroke.
2. Disconnect all three potentiometer wires from the control.
3. Number the wires 1, 2, and 3, in any order.
4. Set your ohmmeter to measure the potentiometer's maximum resistance, normally 20,000  $\Omega$ .
5. Measure and record the resistance between wires 1 and 2. \_\_\_\_\_  $\Omega$
6. Measure and record the resistance between wires 1 and 3. \_\_\_\_\_  $\Omega$
7. Measure and record the resistance between wires 2 and 3. \_\_\_\_\_  $\Omega$
8. The pair of wires with the highest measured value are the positive and negative wires. Connect the wires to the positive and negative actuator terminals on the control. At this time, do not be concerned with which wire you connect to which terminal.
9. Connect the remaining wire to the feedback terminal.
10. Test the actuator using manual mode to see if the control moves it properly. If the actuator moves in the opposite direction than it is supposed to, switch the positive and negative wires on the control.

## Appendix C: Additional modules and repair kits

Repair kits are available for most circuit boards. If you need more information about repair kits, contact your dealer, or visit [www.autoflexcontrols.com](http://www.autoflexcontrols.com).

Replacement parts and repair kits			
<b>KAFXC-DCONTROL2</b> <i>AutoFlex Connect display controller kit</i> <ul style="list-style-type: none"><li>◇ For AutoFlex and AutoFlex Mini</li><li>◇ Includes controller, USB drives, and controller power supply</li></ul>		<b>KAFXC-DISPLAY</b> <i>AutoFlex Connect display kit</i> <ul style="list-style-type: none"><li>◇ For AutoFlex and AutoFlex Mini</li><li>◇ Includes 10-inch LCD and cables</li></ul>	
		<b>HDMI-1FT</b> <i>HDMI cable, 1 foot</i> <ul style="list-style-type: none"><li>◇ For AutoFlex and AutoFlex Mini</li><li>◇ Connects the display controller to the display.</li></ul>	
<b>KAFXC-COM</b> <i>Communication board</i> <ul style="list-style-type: none"><li>◇ For AutoFlex and AutoFlex Mini</li><li>◇ Alarm relay</li></ul>		<b>KAFX-RIBBON</b> <i>Ribbon cable, 10 inches</i> <ul style="list-style-type: none"><li>◇ For AutoFlex only</li><li>◇ Connects the communication board to the mounting board.</li></ul>	
		<b>KAFXM-RIBBON</b> <i>Ribbon cable, 5 inches</i> <ul style="list-style-type: none"><li>◇ For AutoFlex Mini only</li><li>◇ Connects the communication board to the mounting board.</li></ul>	
<b>KAFX-POWER</b> <i>Power supply, 35 W</i> <ul style="list-style-type: none"><li>◇ For AutoFlex only</li></ul>		<b>KAFXM-POWER</b> <i>Power supply, 25 W</i> <ul style="list-style-type: none"><li>◇ For AutoFlex Mini only</li></ul>	
<b>KAFX-MOUNTING</b> <i>AutoFlex mounting board</i> <ul style="list-style-type: none"><li>◇ For AutoFlex only</li><li>◇ Includes 35 W power supply</li></ul>		<b>KAFXM-MOUNTING</b> <i>AutoFlex Mini mounting board</i> <ul style="list-style-type: none"><li>◇ For AutoFlex Mini only</li><li>◇ Includes 25 W power supply</li></ul>	

Additional modules			
<b>ACT-1</b> <i>Actuator Module</i> <ul style="list-style-type: none"> <li>◇ One open and one close relay</li> <li>◇ Potentiometer feedback input</li> </ul>		<b>IN-4</b> <i>Input Module</i> <ul style="list-style-type: none"> <li>◇ Connections for four sensors</li> </ul>	
<b>RM-2</b> <i>Relay Module</i> <ul style="list-style-type: none"> <li>◇ has two high-capacity, general-purpose relays</li> <li>◇ Current sensing</li> </ul>		<b>RM-4</b> <i>Relay Module</i> <ul style="list-style-type: none"> <li>◇ Four general-purpose relays</li> </ul>	
<b>VAC-1</b> <i>Variable AC Module</i> <ul style="list-style-type: none"> <li>◇ One variable output</li> <li>◇ Temperature probe connector</li> <li>◇ Single-Phase Slave connection</li> </ul>		<b>VDC-4</b> <i>Variable DC Module</i> <ul style="list-style-type: none"> <li>◇ Four 0 to 10 V DC signal outputs</li> </ul>	

## Appendix D: Understanding port forwarding

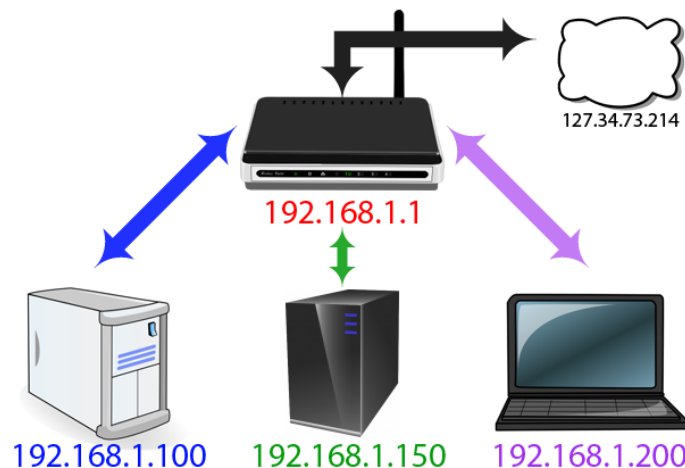
Taken directly from: <https://www.howtogeek.com/66214/how-to-forward-ports-on-your-router/>

There are plenty of projects we've covered that use your computer as a server for other devices. When you're inside of your network, most things will work fine. But some apps, if you want to access them when you're outside your network, make things significantly hairier. Let's start by taking a look at why that is.

### How your router handles requests and uses ports

Here's a map of a simple home network. The cloud icon represents the greater internet and your public, or forward-facing, Internet Protocol (IP) address. This IP address represents your entire household from the outside world—like a street address, in a way.

The red address 192.1.168.1 is the router address within your network. The additional addresses all belong to the computers seen at the bottom of the image. If your public IP address is like a street address, think of the internal IP addresses like apartment numbers for that street address.



The diagram raises an interesting question which you may not have thought about before. How does all the information from the internet get to the right device inside the network? If you visit [howtogeek.com](http://howtogeek.com) on your laptop how does it end up on your laptop and not your son's desktop if the public-facing IP address is the same for all devices?

This is thanks to a wonderful bit of routing magic known as a Network Address Translation (NAT). This function occurs at the router level where the NAT acts like a traffic cop, directing the flow of network traffic through the router so that a single public IP address can be shared among all the devices behind the router. Because of the NAT, everyone in your household can request web sites and other internet content simultaneously and it will all be delivered to the right device.



So where do ports come into this process? Ports are an old but useful holdover from the early days of network computing. Back in the day, when computers could only run one application at a time, all you had to do was point one computer at another computer on the network to connect them as they would be running the same application. Once computers became sophisticated to run multiple applications, early computer scientists had to wrestle with the issue of ensuring applications connected to the right applications. Thus, ports were born.

Some ports have specific applications which are standards throughout the computing industry. When you fetch a web page, for example, it uses port 80. The receiving computer's software knows that port 80 is used for serving http documents, so it listens there and responds accordingly. If you send an http request over a different port—say, 143—the web server won't recognize it because it's not listening there (although something else might be, like an IMAP email server which traditionally uses that port).

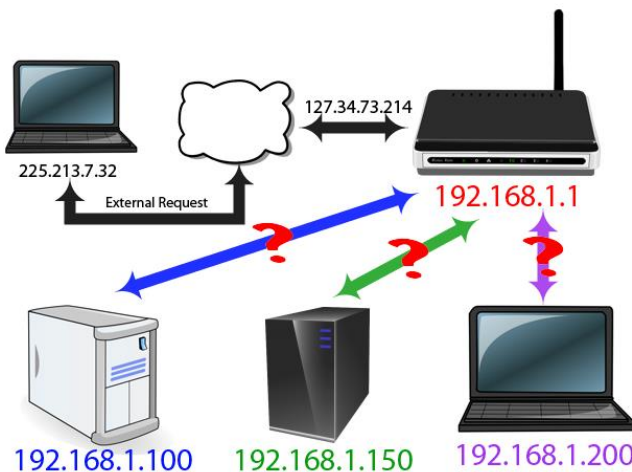
Other ports don't have pre-assigned uses, and you can use them for whatever you want. To avoid interfering with other standard-abiding applications, it's best to use larger numbers for these alternate configurations. Plex Media Server uses port 32400, for example, and Minecraft servers use 25565—both numbers that fall into this “fair game” territory.

Each port can be used via either TCP or UDP. TCP, or Transmission Control Protocol, is what's used most commonly. UDP, or User Datagram Protocol, is less widely used in home applications with one major exception: BitTorrent. Depending on what is listening, it'll be expecting requests to be made in either one or the other of these protocols.

### **Why you need to forward ports**

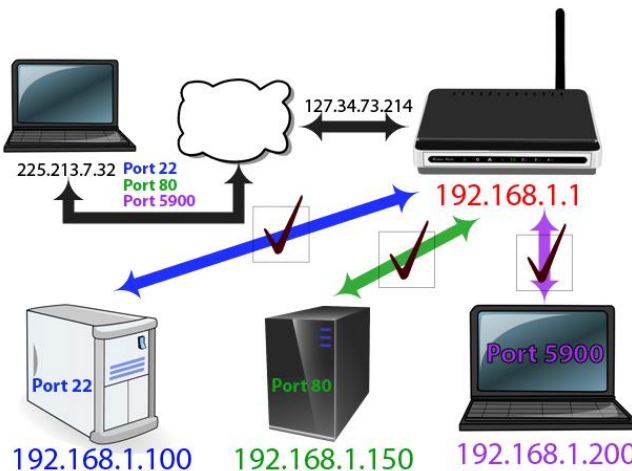
So why exactly would you need to forward ports? While some applications take advantage of NAT to set their own ports and handle the configuration for you, there are still plenty of applications that do not, and you'll need to give your router a helping hand when it comes to connecting services and applications.

In the diagram below we're starting with a simple premise. You're on your laptop somewhere in the world (with an IP address of 225.213.7.42), and you want to connect to your home network to access some files. If you simply plug your home IP address (127.34.73.214) into whatever tool you're using (an FTP client or remote desktop application, for example), and that tool doesn't take advantage of those advanced router features we just mentioned, you're out of luck. It won't know where to send your request, and nothing will happen.



This, by the way, is a great security feature. If somebody connects to your home network and they aren't connected to a valid port, you want the connection to get rejected. That's the firewall element of your router doing its job: rejecting unwelcome requests. If the person knocking on your virtual door, however, is you, then the rejection isn't so welcome and we need to do a little tweaking.

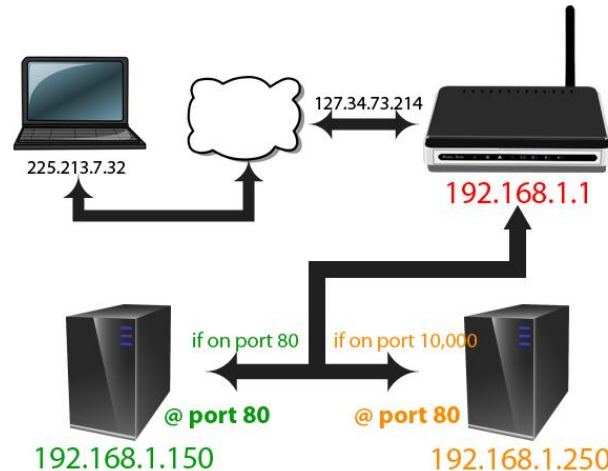
To solve that problem, you want to tell your router "hey: when I access you with this program, you'll need to send it to this device at this port". With those instructions in place, your router will make sure you can access the right computer and application on your home network.



So in this example, when you're out and about and using your laptop, you use different ports to make your requests. When you access your home network's IP address using port 22, your router at home knows that this should go to 192.168.1.100 inside the network. Then, the SSH daemon on your Linux installation will respond. At the same time, you can make a request over port 80, which your router will send to the web server at 192.168.1.150. Or, you can try to remotely control your sister's laptop with VNC, and your router will connect you to your laptop at 192.168.1.200. In this way, you can easily connect to all the devices you've set up a port forward rule for.

The usefulness of port forwarding doesn't end there though! You can even use port forwarding to change existing services' port numbers for clarity and convenience. For example, let's say you have

two web servers running on your home network and you want one to be readily and obviously accessible (e.g. it's a weather server you want people to be able to easily find) and the other web server is for a personal project.



When you access your home network from the public-facing port 80, you can tell your router to send it to port 80 on the weather server at 192.168.1.150, where it will be listening at port 80. But, you can tell your router that when you access it via port 10,000, that it should go to port 80 on your personal server, 192.168.1.250. This way, the second computer doesn't have to be reconfigured to use a different port, but you can still manage traffic effectively—and at the same time by leaving the first web server linked to port 80 you make it easier for people accessing your aforementioned weather server project.

Now that we know what port forwarding is and why we might want to use it, let's take a look at some small considerations regarding port forwarding before diving into actually configuring it.

## Considerations before configuring your router

There are a few things to keep in mind before sitting down to configure your router and running through them in advance is guaranteed to cut down on frustration.

### Set Static IP address for your devices

First and foremost, all your port forwarding rules will fall apart if you're assigning them to devices with dynamic IP addresses assigned by your router's DHCP service.

Your router has a pool of addresses that it reserves just for handing out to devices as they join and leave the network. Think of it like getting a number at a diner when you arrive—your laptop joins, boom, it gets IP address 192.168.1.98. Your iPhone joins, boom, it gets address 192.168.1.99. If you take those devices offline for a period of time or the router is rebooted, then the whole IP address lottery happens all over again.

Under normal circumstances this is more than fine. Your iPhone doesn't care which internal IP address it has. But if you've created a port forwarding rule that says your game server is at a certain IP address and then the router gives it a new one, that rule won't work, and nobody will be able to connect to your game server. In order to avoid that, you need to assign a static IP address to each network device you're assigning a port forwarding rule to. The best way to do that is through your router. Check out this guide (<https://www.howtogeek.com/69612/how-to-set-up-static-dhcp-on-your-dd-wrt-router/>) for more info.

### **Know your IP address (and set a dynamic DNS address)**

In addition to using static IP assignments for the relevant devices inside your network, you also want to be aware of your external IP address—you can find it by visiting [whatismyip.com](http://whatismyip.com) while on your home network. Although it is possible you might have the same public IP address for months or even over a year, your public IP address can change (unless your internet service provider has explicitly given you a static public-facing IP address). In other words, you can't rely on typing in your numeric IP address into whatever remote tool you're using (and you can't rely on giving that IP address to a friend).

Now, while you could go through the hassle of manually checking that IP address each time you leave the house and intend to work away from home (or every time your friend is going to connect to your Minecraft server or the like), that's a big headache. Instead, we highly recommend you set up a Dynamic DNS service which will allow you to link your (changing) home IP address to a memorable address like [mysuperawesomeshomeserver.dynu.net](http://mysuperawesomeshomeserver.dynu.net). For more information how to set up a dynamic DNS service with your home network, check out our full tutorial (<https://www.howtogeek.com/66438/how-to-easily-access-your-home-network-from-anywhere-with-ddns/>).

### **Pay attention to local firewalls**

Once you set up the port forwarding on the router level, there is a possibility that you may need to tweak firewall rules on your computer too. For example, we've gotten a lot of emails over the years from frustrated parents setting up port forwarding so their kids can play Minecraft with their friends. In almost every case, the problem is that despite setting up the port forwarding rules on the router correctly, somebody ignored the Windows firewall request asking if it was OK if the Java platform (that runs Minecraft) could access the greater internet.

Be aware that on computers running local firewall and/or anti-virus software that includes firewall protection, you'll likely need to confirm the connection you've set up is okay.

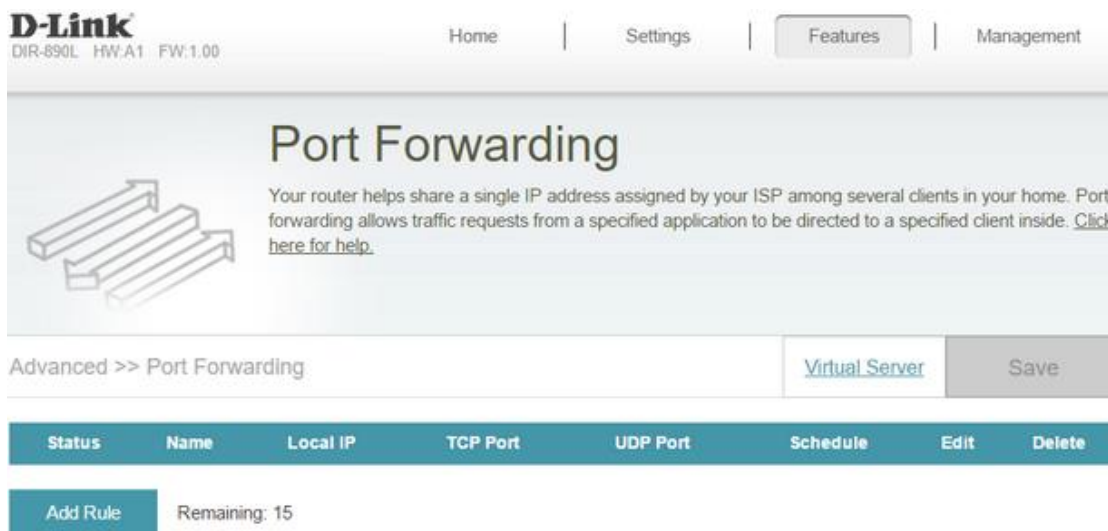
### **Step 1: Locate the port forwarding rules on your router**

Exhausted by all the networking lessons? Don't worry, it's finally time to set it up—and now that you know the basics, it's pretty simple.

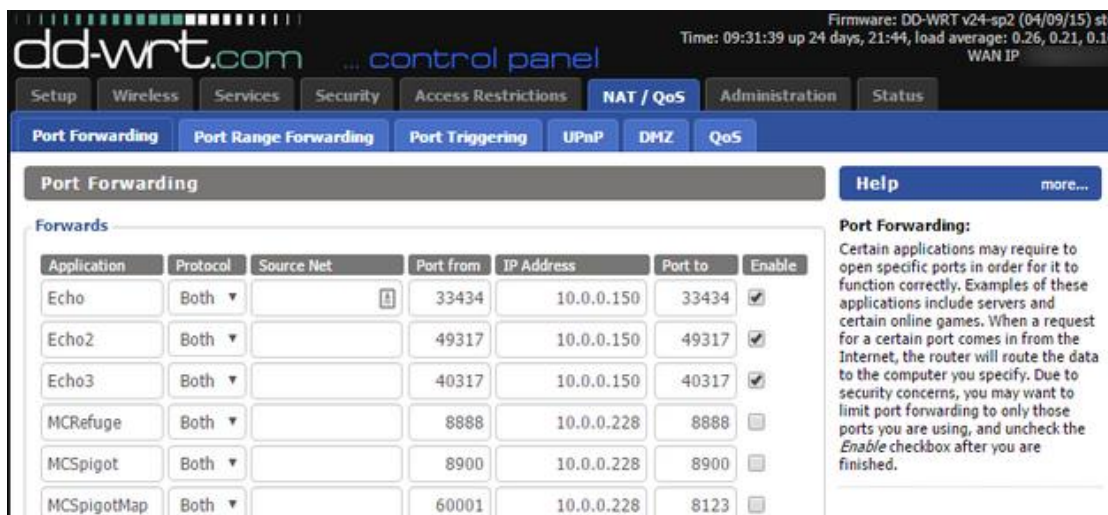
As much as we'd love to provide exact instructions for your exact router, the reality is that every router manufacturer has their own software, and how that software looks can even vary between router models. Rather than attempt to capture every variation, we'll highlight a few to give you an idea what the menu looks like and encourage you to look up the manual or online help files for your particular router to find the specifics.

In general, you're going to be looking for something called—you guessed it—"port forwarding". You may have to look through the different categories to find it, but if your router is any good, it should be there.

For comparison, here's what the port forwarding menu looks like on a **D-Link DIR-890L** router.



And here's what the port forwarding menu looks like on the same router running the popular third-party DD-WRT firmware ( available here: <https://www.howtogeek.com/56612/turn-your-home-router-into-a-super-powered-router-with-dd-wrt/> ).



As you can see, the complexity between the two views varies greatly, even on the same hardware. In addition, the location is completely different within the menus. As such it's most useful if you look up the exact instructions for your device using the manual or a search query.

Once you've located the menu it's time to set up the actual rule.

## Step 2: Create a port forwarding rule

After learning all about port forwarding, setting up a dynamic DNS for your home IP address, and all the other work that went into this, the important step—creating the actual rule—is pretty much a walk in the park. In the port forwarding menu on our router, we're going to create two new port forwarding rules: one for the Subsonic music server and one for a new Minecraft server we just set up.

Subsonic	Both ▼		4040	10.0.0.232	4040	<input checked="" type="checkbox"/>
Minecraft	Both ▼		7777	10.0.0.228	7777	<input checked="" type="checkbox"/>

Despite the differences in location on different router software, the general input is the same. Almost universally, you'll name the port forwarding rule. It's best to simply name it what the server or service is and then append it if need be for clarity (e.g. "Webserver" or "Webserver-Weather" if there is more than one). Remember the TCP/UDP protocol we talked about at the beginning? You'll also need to specify TCP, UDP, or Both. Some people are very militant about finding out exactly what protocol every application and service uses and matching things up perfectly for security purposes. We'll be the first to admit that we're lazy in this regard and we almost always just pick "Both" to save time.

Some router firmware, including the more advanced DD-WRT we're using in the screenshot above, will allow you to specify a "Source" value which is list of IP addresses you're restricting the port forward to for security purposes. You can use this feature if you wish, but be forewarned it introduces a whole new host of headaches as it presumes that remote users (including you when you're away from home and friends who are connecting in) have static IP addresses.

Next you'll need to put in the external port. This is the port that will be open on the router and facing the internet. You can use any number you want here between 1 and 65535, but practically most of the lower numbers are taken up by standard services (like email and web servers) and many of the higher numbers are assigned to fairly common applications. With that in mind, we'd recommend picking a number above 5,000 and, to be extra safe, using Ctrl+F to search this long list of TCP/UDP port numbers to make sure you're not selecting a port that conflicts with an existing service you're already using.

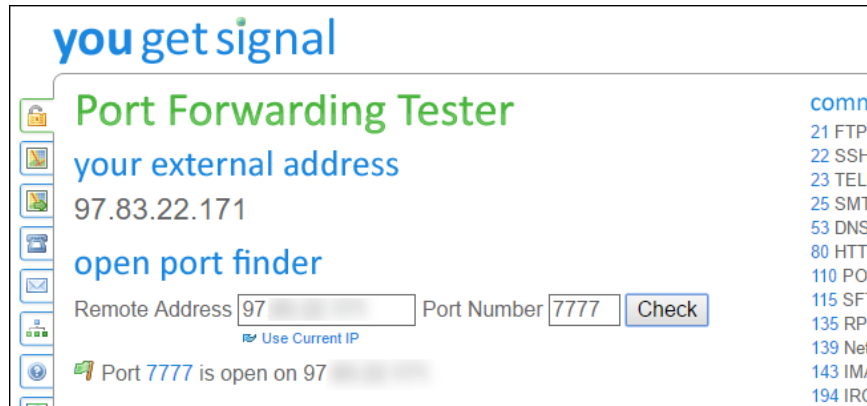
Finally, put in the internal IP address of the device, the port you on that device, and (if applicable) toggle the rule on. Don't forget to save the settings.



**Step 3: Test your port forwarding rule**

The most obvious way to test if your port forward worked is to connect using the routine intended for the port (e.g. have your friend connect their Minecraft client to your home server), but that's not always an immediately available solution if you're not away from home.

Thankfully, there's a handy little port checker available online at YouGetSignal.com. We can test to see if our Minecraft server port forward took simply by having the port tester try to connect to it. Plug in your IP address and the port number and click "Check".



You should receive a message, as seen above, like "Port X is open on [Your IP]". If the port is reported as closed, double check both the settings in the port forwarding menu on your router and your IP and port data in the tester.

It's a wee bit of a hassle to set up port forwarding, but as long as you assign a static IP address to the target device and set up a dynamic DNS server for your home IP address, it's a task you only need to visit once to enjoy hassle free access to your network in the future.



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Phason hereby warrants that should the AUTOFLEX fail because of improper workmanship, Phason will repair the unit, effecting all necessary parts replacements without charge for either parts or labor.

### Conditions

- ◆ Installation must be done according to our enclosed installation instructions.
- ◆ The product must not have been previously altered, modified, or repaired by anyone other than Phason.
- ◆ The product must not have been involved in an accident, misused, abused, or operated or installed contrary to the instructions in our user and/or installation manuals. Phason's opinion about these items is final.
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- ◆ All transportation charges for products submitted for warranty must be paid by the purchaser.

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- ◆ If you are having a problem using your AutoFlex, look in **Appendix A: Troubleshooting** on page 37, and then follow the directions for correcting the problem.
- ◆ If you still have a problem with your AutoFlex, collect the following information:
  - ◆ The serial number
  - ◆ Any messages displayed by your AutoFlex
  - ◆ A description of the problem
  - ◆ A description of what you were doing before the problem occurred



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