AutoFleX CONNECT II

Phason

Installation guide

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Chapter 1: Introduction

Introducing AutoFlex Connect

Your facility management solution

AutoFlex Connect brings flexibility and versatility to your fingertips. With AutoFlex Connect, you can control and manage ventilation, supplemental cooling, heating, lighting, feeding, and more.

Flexible, versatile, and expandable

AutoFlex Connect controls are modular. This means you have the flexibility to build the control with only the features you need and to expand in the future.

Smart Modules are available to control variable or fixed-speed fans, air inlets, curtains, lighting, feed loops, and more. On the monitoring side, you can choose to monitor conditions such as temperature, humidity, ammonia, carbon dioxide, and more.

One size does not fit all

Each facility has its own needs. With AutoFlex Connect, you have two sizes of controls to choose from. This allows you to choose the right control for your application.

- Up to 14 modules for AFX-CONNECT
- Up to 6 modules for AFXMINI-CONNECT

Expansion Boxes are available to add additional capacity.

Stay connect anywhere, anytime

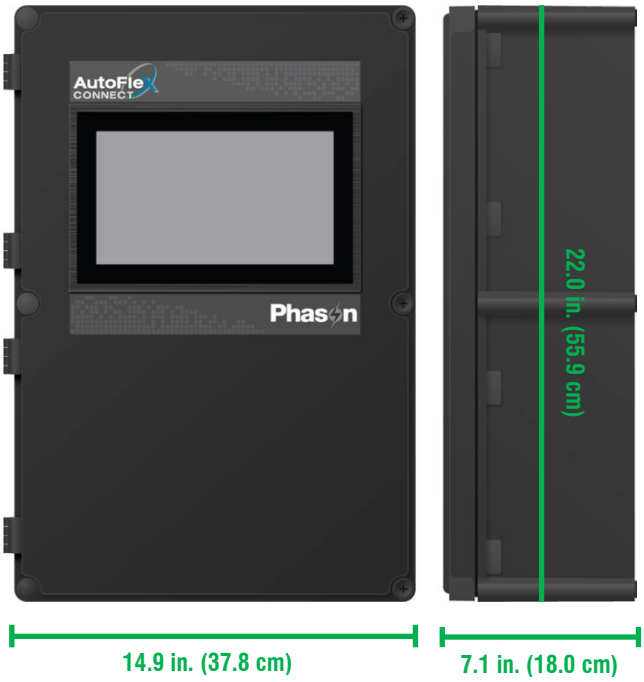
Not at the control? No problem. AutoFlex Connect is accessible from any web-enabled device. No matter where you are, your AutoFlex Connect controls are always within reach.

Features

- Intuitive user interface with 10-inch **capacitive touch** display
- Local configuration and monitoring at the control using the touchscreen
- Remote configuration and monitoring from any web-enabled device
- Smart Modules for controlling equipment and monitoring sensors
- Two ventilation control modes: traditional staged and **VentGrid™** combi table
- 16 zones available for control and monitoring, monitor or manage:
  - Temperature
  - Humidity
  - Carbon dioxide (CO2)
  - Ammonia (NH3)
  - Static pressure
  - Barometric pressure
  - Wind speed
  - Wind direction
  - Rain
  - Light level
  - Current
  - Digital switches
  - Pulses
  - THI
  - Wind chill
- Full analytics package with customizable reports sent at your convenience
- Two sizes of controls available, 14 or 6 modules
- Available Expansion Boxes to increase module capacity
  - **EXPANSION-14:** 14 modules
  - **EXPANSION-6:** 6 modules
- NEMA 4X enclosure (corrosion-resistant, water-resistant, and fire-retardant)
- CE certification
- QPS certification
- 2-year limited warranty

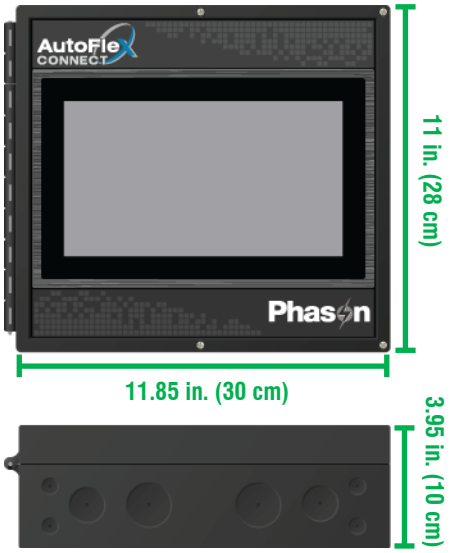
AutoFlex Connect

Room for 14 modules



AutoFlex Connect Mini

Room for 6 modules



Available modules

Actuator Module with potentiometer feedback (model ACT-1)

The ACT-1 is a Smart Module that has one open and one close relay to control inlets and curtain machines, with potentiometer feedback or without (timed). The ACT-1 features a built-in microprocessor that precisely controls equipment and provides safety protection.

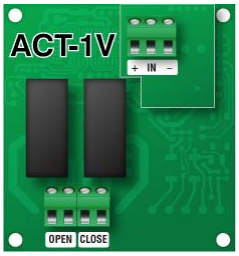
For installation information, read **Connecting equipment to ACT-1, ACT-1T, and ACT-1V** modules on page 15.

Actuator Module with timed feedback (model ACT-1T)

The ACT-1T is a Smart Module that has one open and one close relay, each with a current sensor, to control inlets that require timed feedback. The ACT-1T features a built-in microprocessor that precisely controls equipment while continuously monitoring the current and providing safety protection.

For installation information, read **Connecting equipment to ACT-1, ACT-1T, and ACT-1V** modules on page 15.

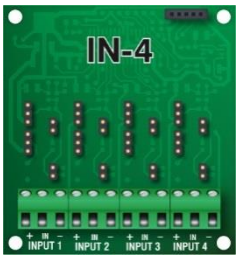
Actuator Module with 0-10 V DC-signal feedback (model ACT-1V)



The ACT-1V is a Smart Module that has one open and one close relay to control drive motors that have 0-10 V DC signal output, such as actuators or curtain machines. The ACT-1V features a built-in microprocessor that precisely controls equipment and provides safety protection.

For installation information, read **Connecting equipment to ACT-1, ACT-1T, and ACT-1V** modules on page 15.

Input Module (model IN-4)



The IN-4 is a four-input Smart Module that precisely measures analog, digital, and pulse/count sensors. The IN-4 has a built-in microprocessor that continuously monitors the sensors and communicates the status and any fault conditions.

For installation information and a list of supported sensors, read **Connecting sensors** on page 18.

Relay Module with current sensing (model RM-2)

The RM-2 is a Smart Module that has two high-capacity relays, each with a **current sensor**. The relays can be used to control equipment such as single-speed fans, heaters, lights, and other equipment. The RM-2 features a built-in microprocessor that precisely controls equipment while continuously monitoring the current and providing safety protection.

For installation information, read **Connecting equipment to RM-2, RM-2-3PH, and RM-4 modules** on page 21.

Three-Phase Relay Module (model RM-2-3PH)

The RM-2-3PH is a Smart Module that has two high-capacity relays and two pilot relays for controlling three-phase motors and equipment. The relays operate as pairs, with one high-capacity and one pilot relay in each pair. The high-capacity relays have current sensing.

For installation information, read **Connecting equipment to RM-2, RM-2-3PH, and RM-4 modules** on page 21.

Relay Module (model RM-4)

The RM-4 is a Smart module that has four relays to control fans, heaters, lights, and other equipment. The RM-4 features a built-in microprocessor that precisely controls equipment.

For installation information, read **Connecting equipment to RM-2, RM-2-3PH, and RM-4 modules** on page 21.

Variable AC module (model VAC-1)

The VAC-1 is a single-output Smart Module with a **current sensor** that can control variable-speed fans, heat mats, and lights. A temperature probe connector is included for heat mat control. There is also a connection for a Variable Load Expansion Box. A built-in microprocessor that precisely controls equipment while also providing safety protection.

For more information, read **Connecting equipment to VAC-1 modules** on page 22. For Variable Load Expansion Box information, visit **www.phason.ca**.

Variable Chimney Module (model VCM-DC)

The VCM-DC is a Smart Module that monitors and precisely controls airflow using a chimney fan, damper, and measuring fan. The VCM-DC features a built-in microprocessor that precisely controls equipment and continuously monitors and handles fault conditions.

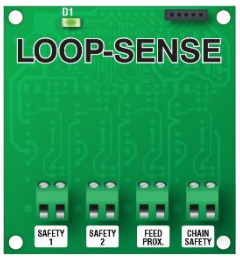
For installation information, read **Connecting equipment to VCM-DC modules** on page 24.

Variable DC Module (model VDC-4)

The VDC-4 is a Smart Module that has four outputs for controlling variable frequency drives (VFD), FanDRIVEs, or other equipment requiring a 0 to 10 V DC signal. The VDC-4 features a built-in microprocessor that precisely controls equipment while also providing safety protection.

For installation information, read **Connecting equipment to VDC-4 modules** on page 25.

Feed Loop Kit (model AFX-FEED-LOOP)



The Feed Loop Kit contains a drive module and a sensor module. The drive module has one relay for a chain/drive motor and one for an auger/fill motor. Both relays include current sensing. The sensor module has one input for a proximity sensor and one for a chain safety sensor. There are two inputs for additional sensors.

For installation information, read **Connecting equipment to Feed Loop Kits** on page 26.

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 if 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. Lightning does not have to 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.

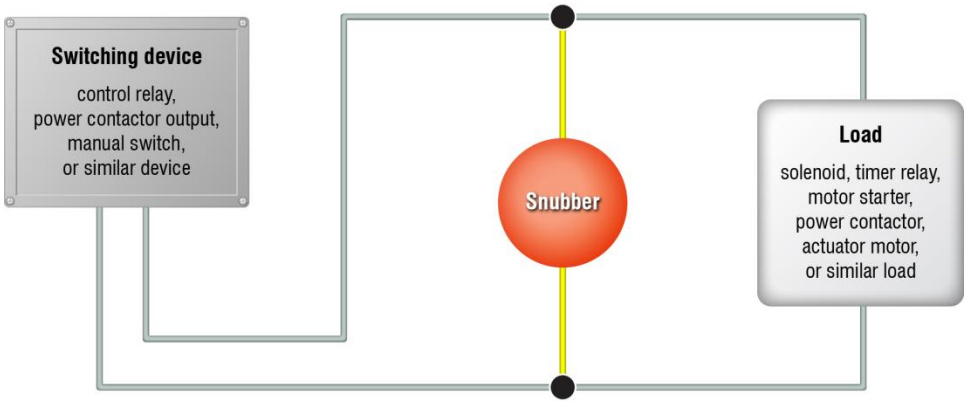
Phason highly recommends installing filters on all inductive loads.

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.



Note

- ◇ 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 10.
- ◇ For more information about snubber filters or other Phason accessories, see your dealer or visit **www.phason.ca**.

Control and module electrical ratings

Control power	85 to 264 VAC, 50/60 Hz
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
ACT-1 **ACT-1V**	15 A at 120/230 VAC, general-purpose (resistive) 1/2 HP at 120 VAC, 1 HP at 230 VAC 0-10 V DC signal feedback **(ACT-1V only)**
ACT-1T **LOOP-DRIVE** **RM-2**	20 A at 120/230 VAC, general-purpose (resistive) 1 HP at 120 VAC, 2 HP at 230 VAC
RM-2-3PH	1 HP at 120 VAC, 2 HP at 230 VAC 230 VAC coil, 70 VA inrush, pilot duty
RM-4	15 A at 120/230 VAC, general-purpose (resistive) 1/2 HP at 120 VAC, 1 HP at 230 VAC
VAC-1	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
VCM-DC **VDC-4**	0 to 10 VDC, 2K Ω load

Using power contactors to increase the capacity of relays

Phason's Manual Override Box (model **MOB-4**) has four 240-volt power contactors that allow you to increase the load handling capability of control relays. Manual Override Box is ideal for secondary ventilation fans and electric heaters.

MOB-4 electrical ratings

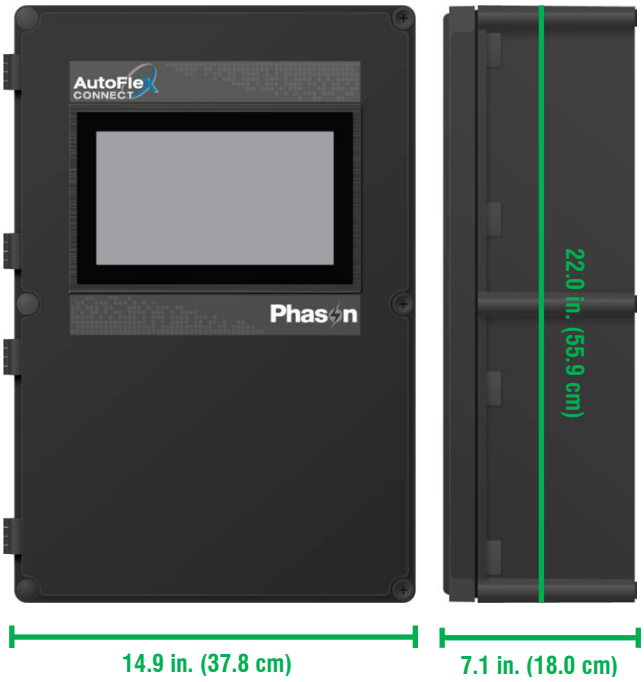
- Coil: 10.2 mA at 240 VAC
- Contact: 25 A at 240 VAC; resistive
  2 HP at 240 VAC, 1 HP at 120 VAC; motor, power factor 0.4
  1300 W at 120 VAC; tungsten

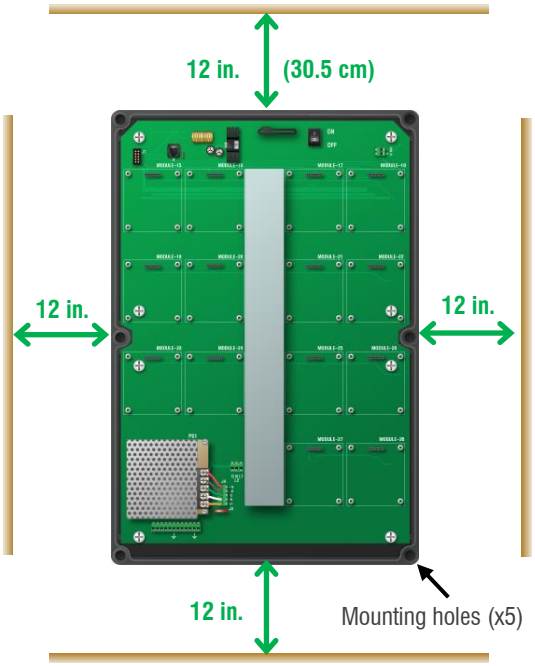
For more information about power contactors, visit **www.phason.ca**.

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 Connect II





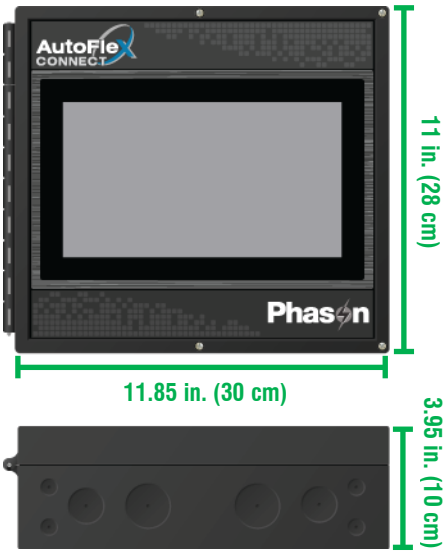
Mount high-voltage modules next to the trough and then run the cabling through the trough. These are the high-voltage modules:

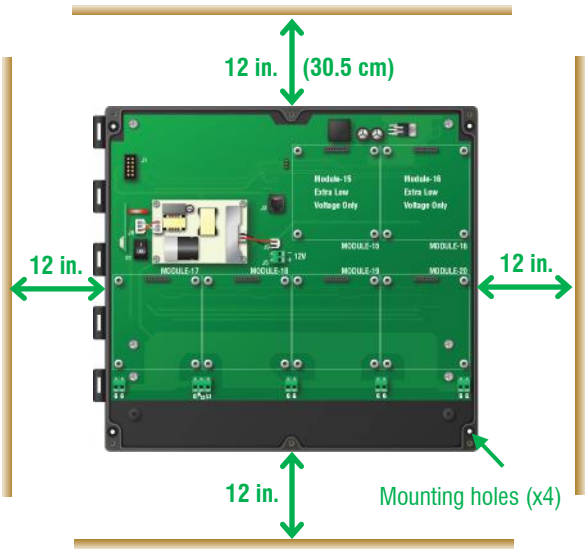
- ◇ ACT-1
- ◇ ACT-1T
- ◇ ACT-1V
- ◇ RM-2
- ◇ RM-2-3PH
- ◇ RM-4
- ◇ VAC-1
- ◇ LOOP-DRIVE

Mount low-voltage modules in the outer positions and then run the cabling along the inside of the enclosure. These are the low-voltage modules:

- ◇ IN-4
- ◇ VCM-DC
- ◇ VDC-4
- ◇ LOOP-SENSE

AutoFlex Connect II Mini





Mount high-voltage modules only in any of the bottom four module positions. These are the high-voltage modules:

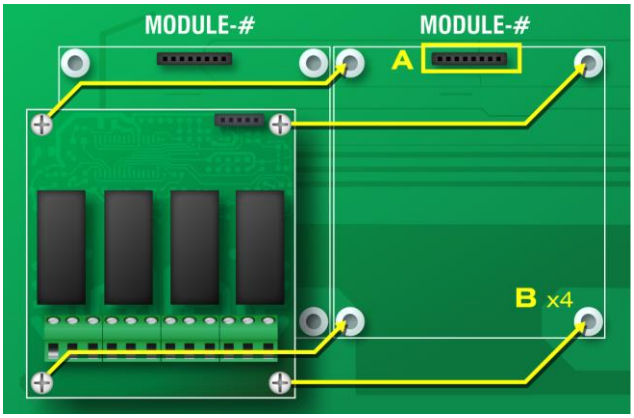
- ◇ ACT-1
- ◇ ACT-1T
- ◇ ACT-1V
- ◇ RM-2
- ◇ RM-2-3PH
- ◇ RM-4
- ◇ VAC-1
- ◇ LOOP-DRIVE

Module positions 1 and 2 are for low-voltage modules only. Run the cabling along the inside of the enclosure for modules 1 and 2. These are the low-voltage modules:

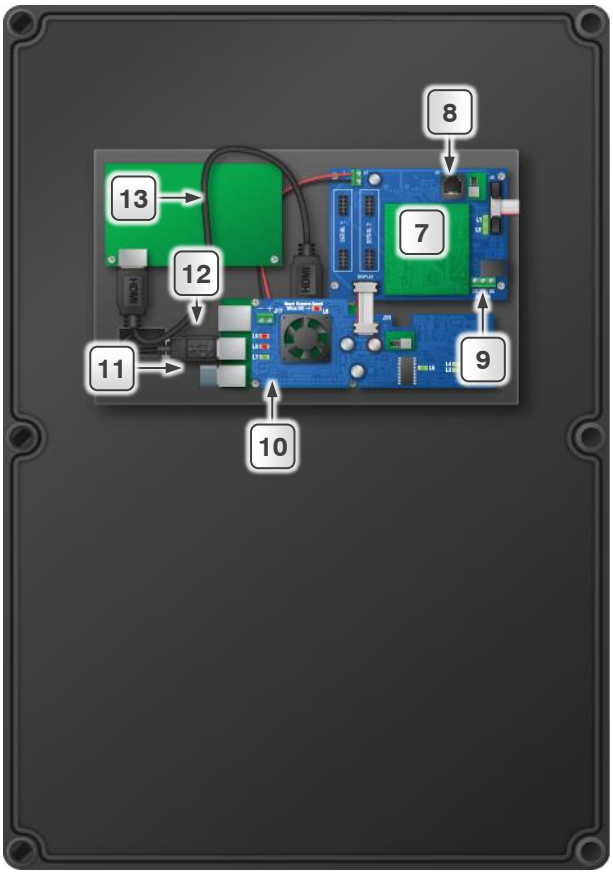
- ◇ IN-4
- ◇ VCM-DC
- ◇ VDC-4
- ◇ LOOP-SENSE

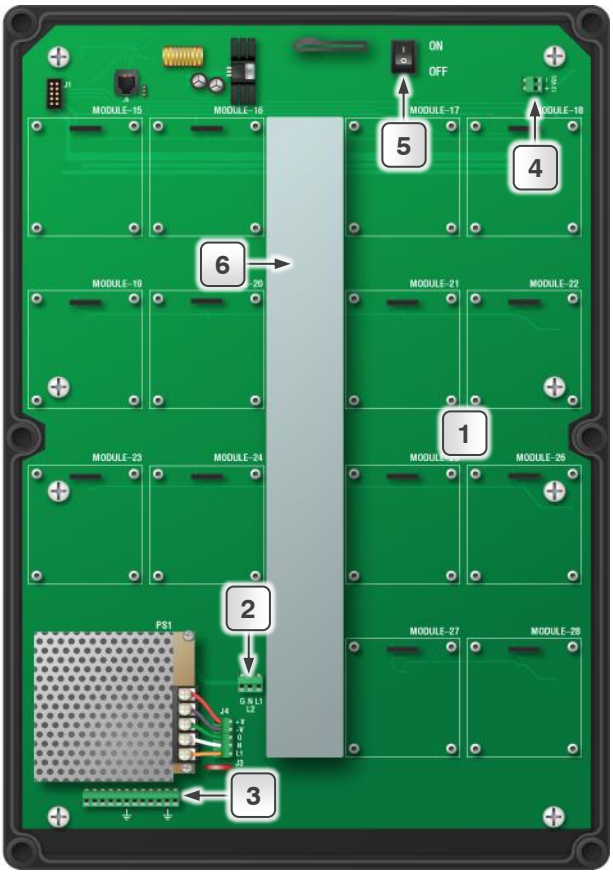
Installing modules

1. Position the module over the connector (A) and then press straight on to the connector.
2. Fasten the module in place using **all four screws** (B) provided.



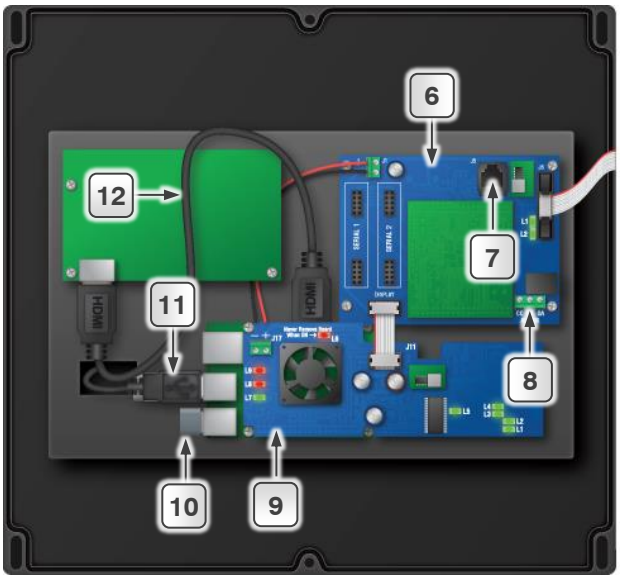
AutoFlex layout

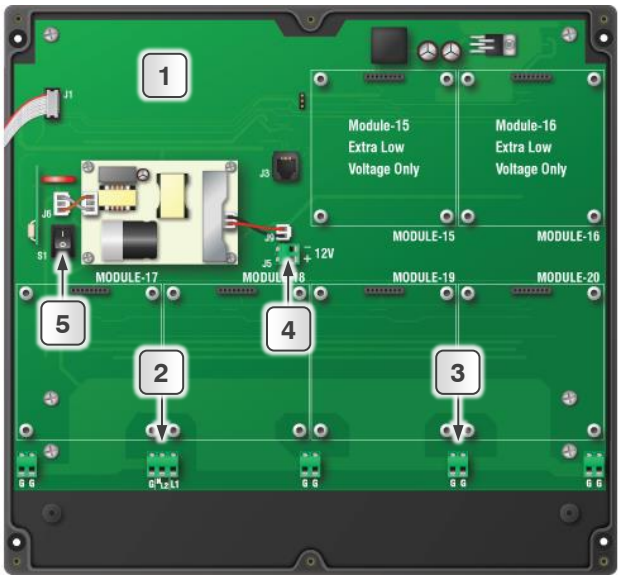




1	**Mounting board:** make sure all module boards, incoming power, and the ribbon cable from the communication controller are properly connected.
2	**Incoming power terminal:** connect 120/230 VAC, 50/60 Hz power. See page 28.
3	**Ground terminals:** connect any equipment grounds to these terminals. See page 28.
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	**Expansion Box cable connection:** connect an optional Expansion Box (model EXPANSION-6 or EXPANSION-14).
9	**Alarm relay terminal:** If you have an external alarm system, connect it here. See page 27.
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





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 28.
3	**Ground terminals:** connect any equipment grounds to these terminals. See page 28.
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.
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8	**Alarm relay terminal:** If you have an external alarm system, connect it here. See page 27.
9	**Display Controller:** make sure the power supply (top board) is properly connected to the bottom board, and all cables are properly connected.
10	**USB drives:** (appearance may vary) make sure the USB drives are properly connected to the USB ports.
11	**USB cable:** make sure the cable is properly connected to the display controller.
12	**HDMI cable:** make sure the cable is properly connected at both ends.

Connecting equipment to modules

- ◇ You can connect more than one piece of equipment to a variable stage or relay if 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 ACT-1, ACT-1T, and ACT-1V modules

Actuator Modules have one OPEN and one CLOSE relay specifically for actuator and curtain control. There are three options:

- **ACT-1** has a connection for **potentiometer feedback**.
- **ACT-1V** has a connection for **0-10 V DC-signal feedback**.
- **ACT-1T** uses **timed feedback**.

The ratings of the equipment connected must not exceed the relay ratings of the Actuator Module.

ACT-1 and ACT-1V

- ◇ 15 A at 120/230 VAC, general-purpose (resistive)
- ◇ 1/2 HP at 120 VAC, 1 HP at 230 VAC
- ◇ 0-10 V DC-signal feedback (ACT-1V only)

ACT-1T

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

Actuators

Actuator control is for equipment that opens and closes to an exact position. For example, inlets can be open between 0 and 100 percent. Actuators use feedback to indicate their position to the control. For a linear actuator, feedback lets the control know how far the actuator's arm is extended.

Most linear actuators with potentiometer feedback have 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

Curtain machines are sometimes referred to as winches. They open and close curtains or louvers to let in more air or less air. The idea is that more air cools the building. Curtain machines use open, close, and idle durations instead of feedback.

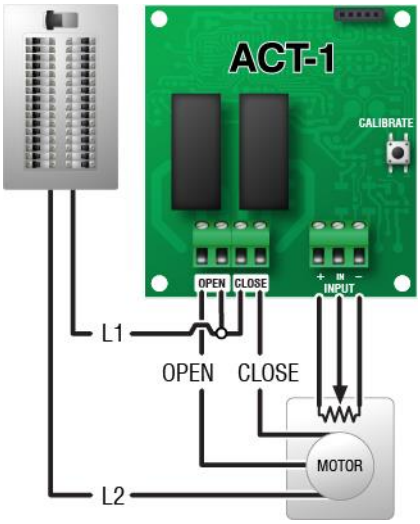
To connect actuators

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 43.

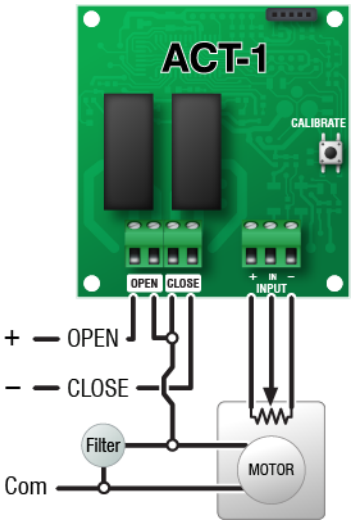
- ◇ When routing the actuator feedback wires, do not run them in or along the same conduit as AC-power lines.
- ◇ If you are using potentiometer feedback and are unsure of the wiring for your actuator, read **Determining correct actuator feedback wiring** on page 44.
- ◇ If you are measuring AC power 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.

Actuators using *potentiometer feedback*

AC-powered

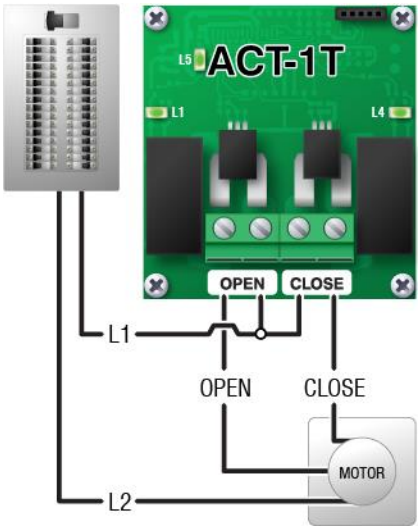


DC-powered

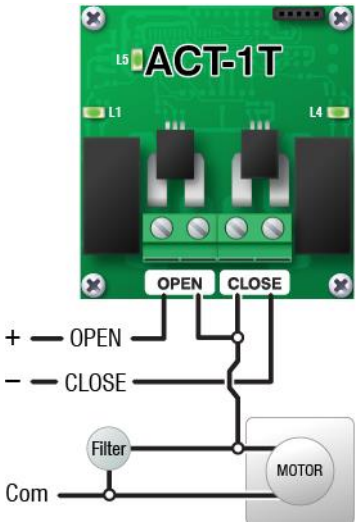


Actuators using *timed feedback*

AC-powered

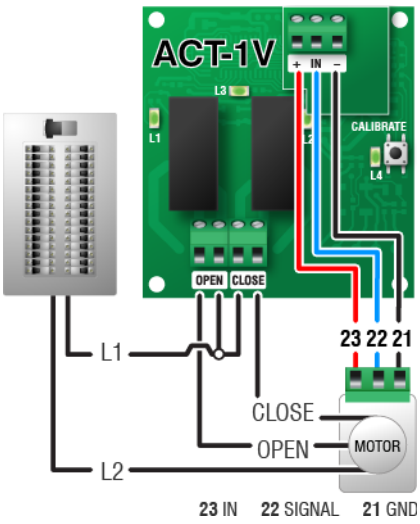


DC-powered

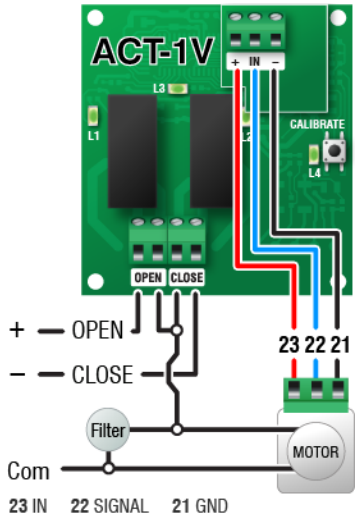


Actuators using *DC-signal feedback*

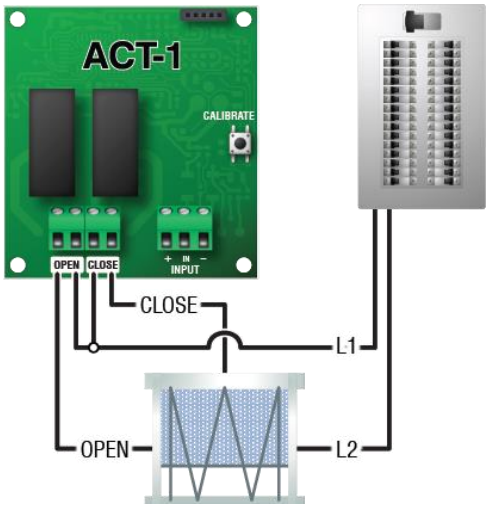
AC-powered



DC-powered



To connect curtain machines



Connecting sensors to IN-4 modules

The IN-4 Input Module has connections for four analog sensors, dry contact switches, or dry contact pulse outputs.

Compatible sensors and devices

Function	Model	Version	Maximum cable distance	
Temperature	3K series	All	500 ft.	152 m
	DOL15	--	500	152
Temperature and humidity	DOL114	4 - 20 mA only	330	100
Humidity	RHS	All	100	30
Carbon dioxide (CO2)	DOL19	4 - 20 mA only	656	200
Ammonia (NH3)	DOL53	0 - 10 V only	500	152
Light	DOL16	100/1000 lx only	328	100
Static pressure	SPS-2	--	300	91
Rain	PRS	--	500	152
Wind speed	WINDSPEED-03	--	1500	457
Wind speed and direction, barometric pressure **Temperature not supported*	DOL58	0 - 10 V only;	656	200
Current	CURRENTSENSE-2	--	500	152

Other devices

- Dry contact pulse output, such as a water meter
- Dry contact digital switch

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.

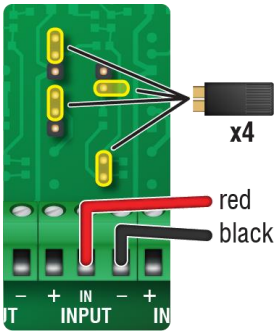
Wired connections and shunt positions

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. Refer to the sensor's installation guide for more information.

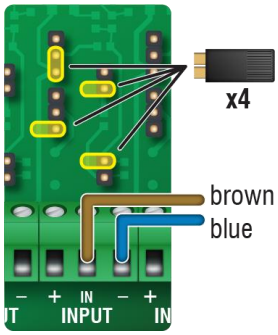
Note

The **DOL 19** carbon dioxide, **DOL 53** ammonia, and **DOL 58** weather sensors require external power supplies. For more information, refer to the installation guides for those products.

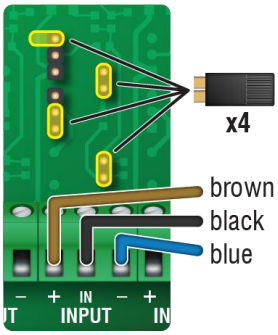
3K series



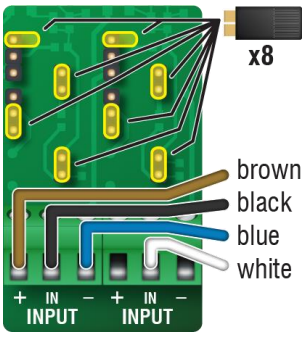
DOL 15



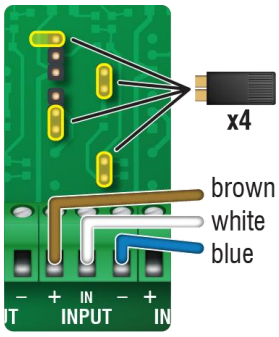
DOL 114, temperature only



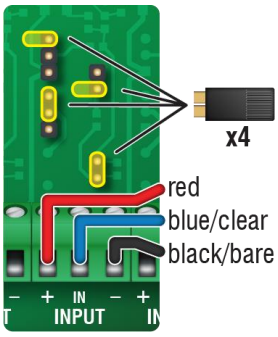
DOL 114, temp. and humidity



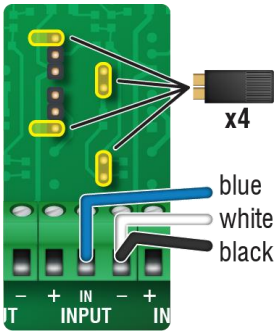
DOL 114, humidity only



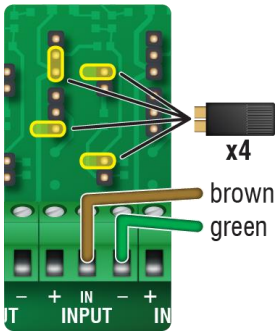
RHS



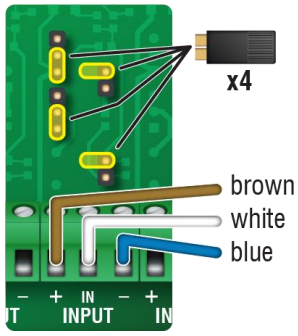
DOL 19



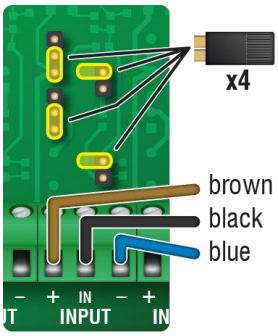
DOL 53



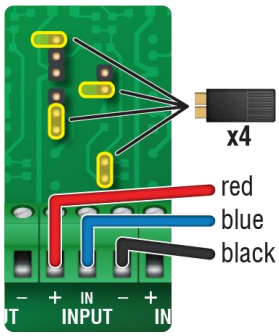
DOL 16, 100 lux



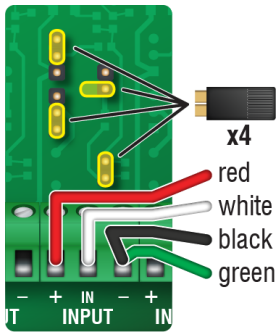
DOL 16, 1000 lux



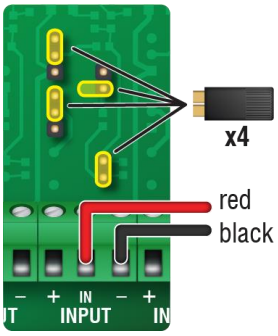
SPS-2



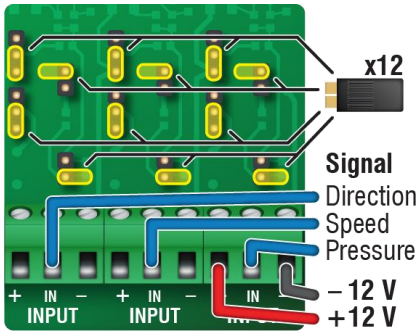
PRS



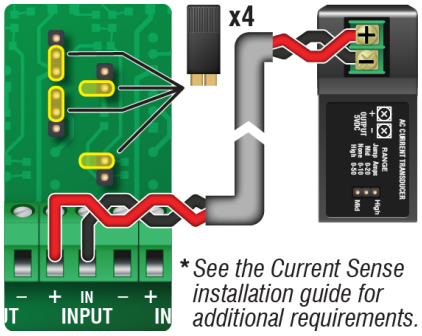
WINDSPEED-03



DOL 58

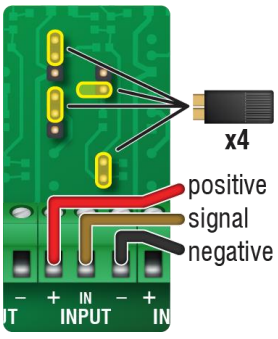


CURRENTSENSE-2

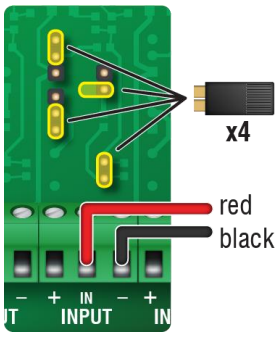


** See the Current Sense installation guide for additional requirements.*

Dry contact digital switch



Dry contact pulse output



Connecting equipment to RM-2, RM-2-3PH, and RM-4 modules

Relay Modules have general-purpose relays for controlling fans, heaters, lights, and other equipment.

- The **RM-2** has two high-capacity relays. Each relay has a **current sensor**.
- The **RM-2-3PH** has two high-capacity relays and two pilot relays for controlling three-phase motors and equipment. The relays operate as pairs, with one high-capacity and one pilot relay in each pair. The high-capacity relays have current sensing.
- The **RM-4** has four relays. The RM-4 *does not have* current sensors.

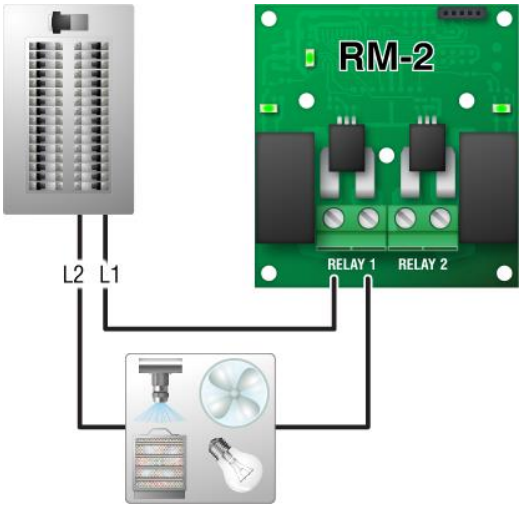
For curtain machines, read **Connecting equipment to ACT-1, ACT-1T, and ACT-1V modules on page 15.**

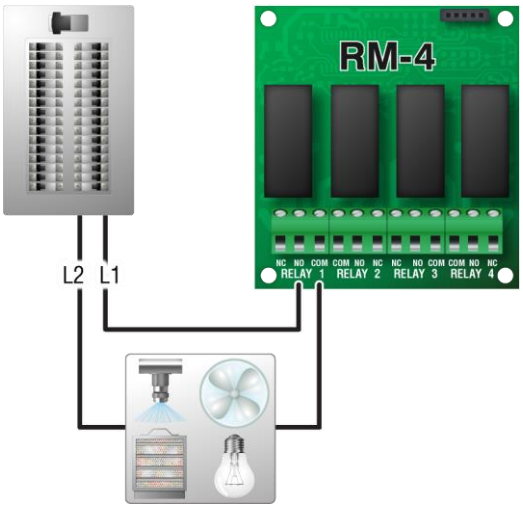
The ratings of the equipment you connect must not exceed the ratings of the Relay Module.

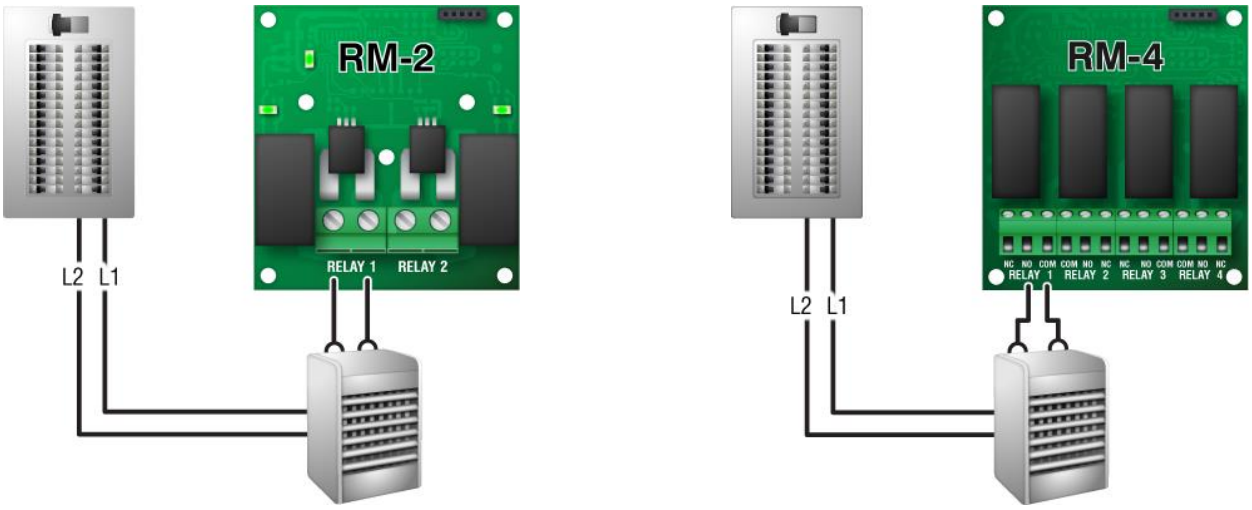
- ◇ **RM-2** 20 A at 120/230 VAC, general-purpose (resistive); 1 HP at 120 VAC; 2 HP at 230 VAC
- ◇ **RM-4** 15 A at 120/230 VAC, general-purpose (resistive); 1/2 HP at 120 VAC; 1 HP at 230 VAC
- ◇ **RM-2-3PH** 1 HP at 120 VAC; 2 HP at 230 VAC; 230 VAC coil, 70 VA inrush, pilot duty

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.

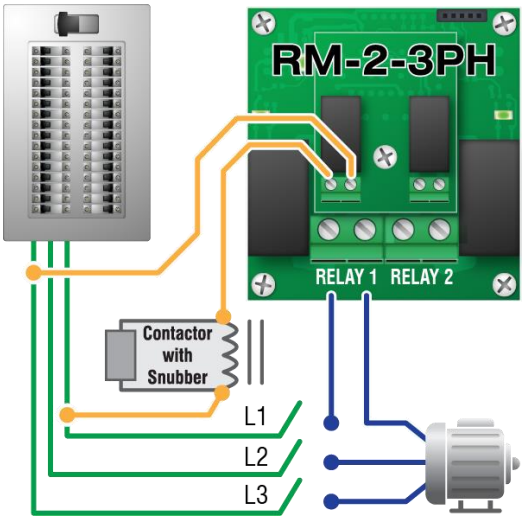
To connect equipment to Relay Modules (RM-2 and RM-4)







To connect motors to Three-Phase Relay Modules (RM-2-3PH)



Connecting equipment to VAC-1 modules

The VAC-1 is a single-output Smart Module with a **current sensor** that can control variable-speed fans, heat mats, and lights. A temperature probe connector is included for heat mat control.

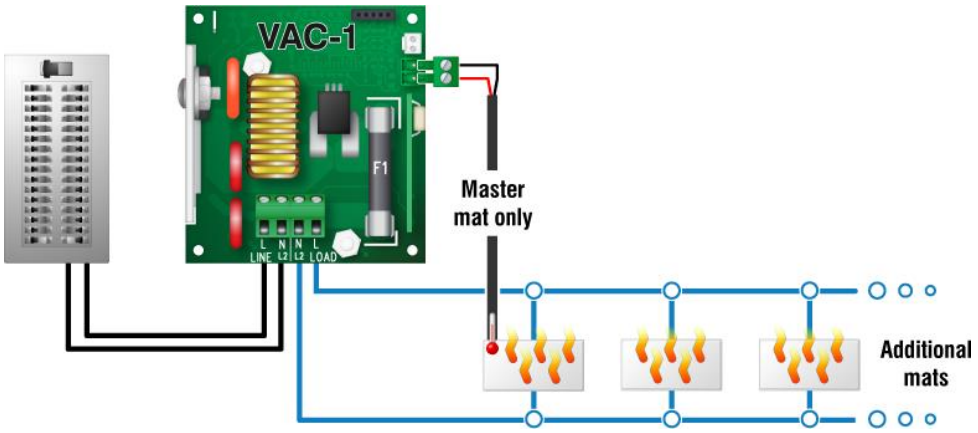
The VAC-1 also has a connection for a Variable Load Expansion Box (model **VLX-20**). For more information, contact your dealer or visit **www.phason.ca**.

The ratings of the equipment you connect must not exceed the ratings of the VAC-1.

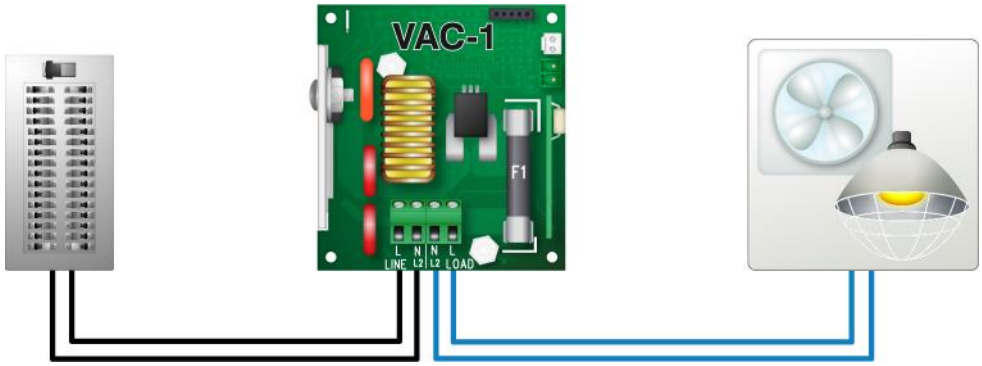
- ◇ 7 A at 120/230 VAC, general-purpose (resistive)
- ◇ 4.9 FLA at 120/230 VAC, PSC motor
- ◇ 1/2 HP at 120 VAC, 1 HP at 230 VAC
- ◇ 800 W at 120 VAC, 1600 W at 230 VAC
- ◇ Fuse: 15 A, 250 VAC ABC-type ceramic

To connect heat mats

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

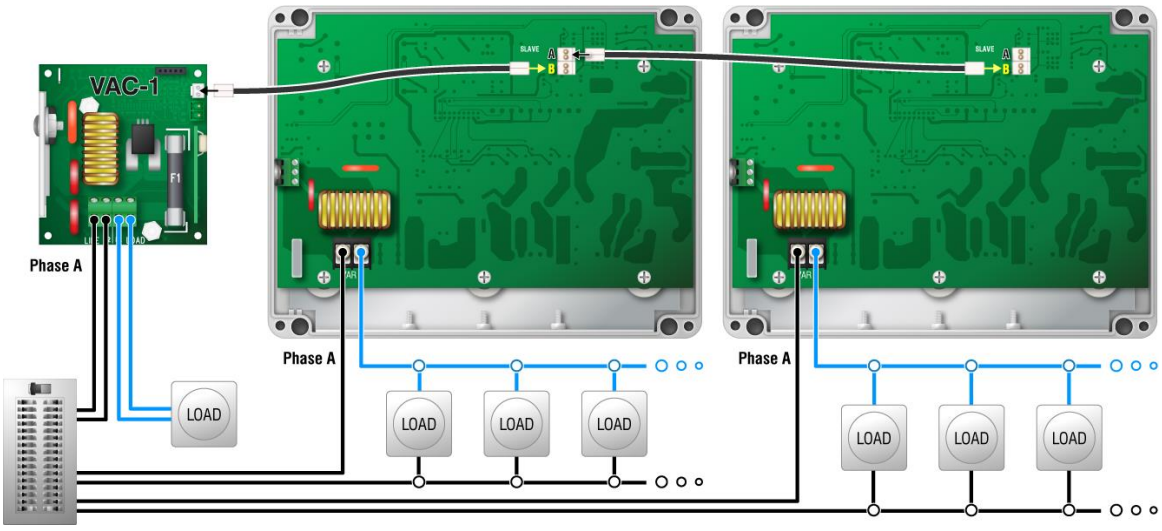


To connect variable speed fans or heat lamps



To connect Variable Load Expansion Boxes

The VAC-1 and Variable Load Expansion Box (model **VLX-20**) **must** be on the same phase.



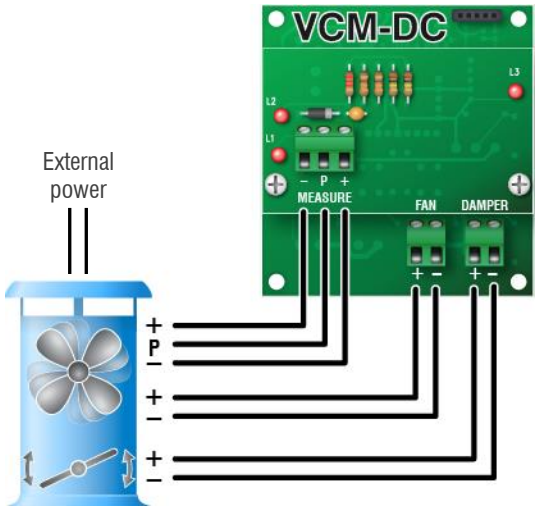
Connecting equipment to VCM-DC modules

The VCM-DC is a Smart Module that monitors and precisely controls airflow using a chimney fan, damper, and measuring fan.

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

- ◇ 0 to 10 VDC, 2K Ω load

To connect chimney fans, dampers, and measuring fans



Connecting equipment to VDC-4 modules

The VDC-4 has four outputs for controlling variable frequency drives (VFD), FanDRIVEs, or other equipment requiring a 0 to 10 V DC signal.

The ratings of the equipment you connect must not exceed the ratings of the VDC-4.

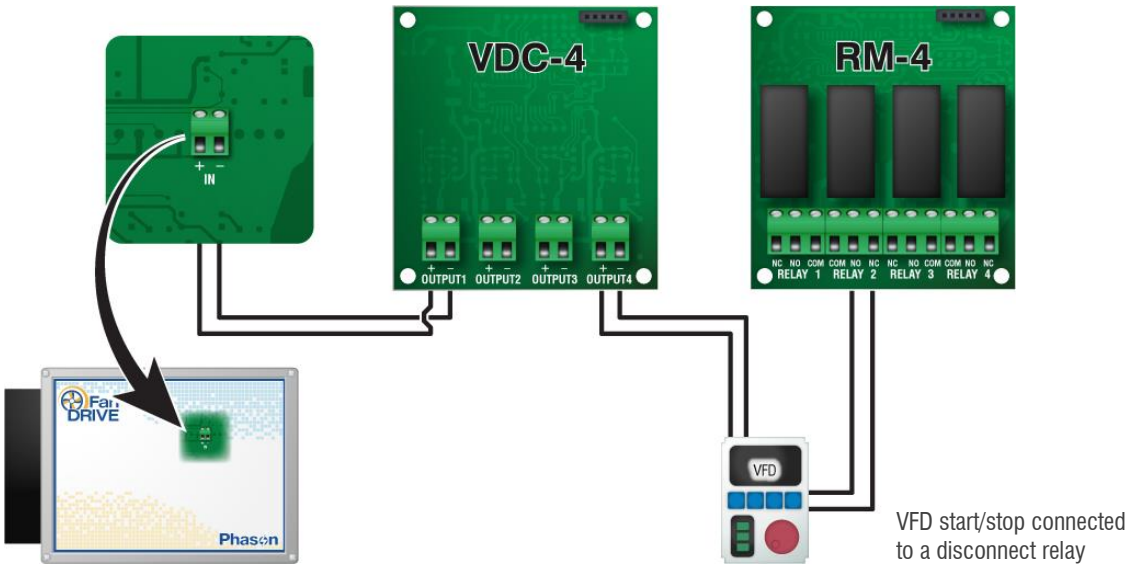
◇ 0 to 10 VDC, 2K Ω load

FanDRIVEs

FanDRIVEs are for controlling AC variable fans, and are a cost-effective way to increase the capacity of your 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**.

To connect variable frequency drives or FanDRIVEs



VFD start/stop connected to a disconnect relay

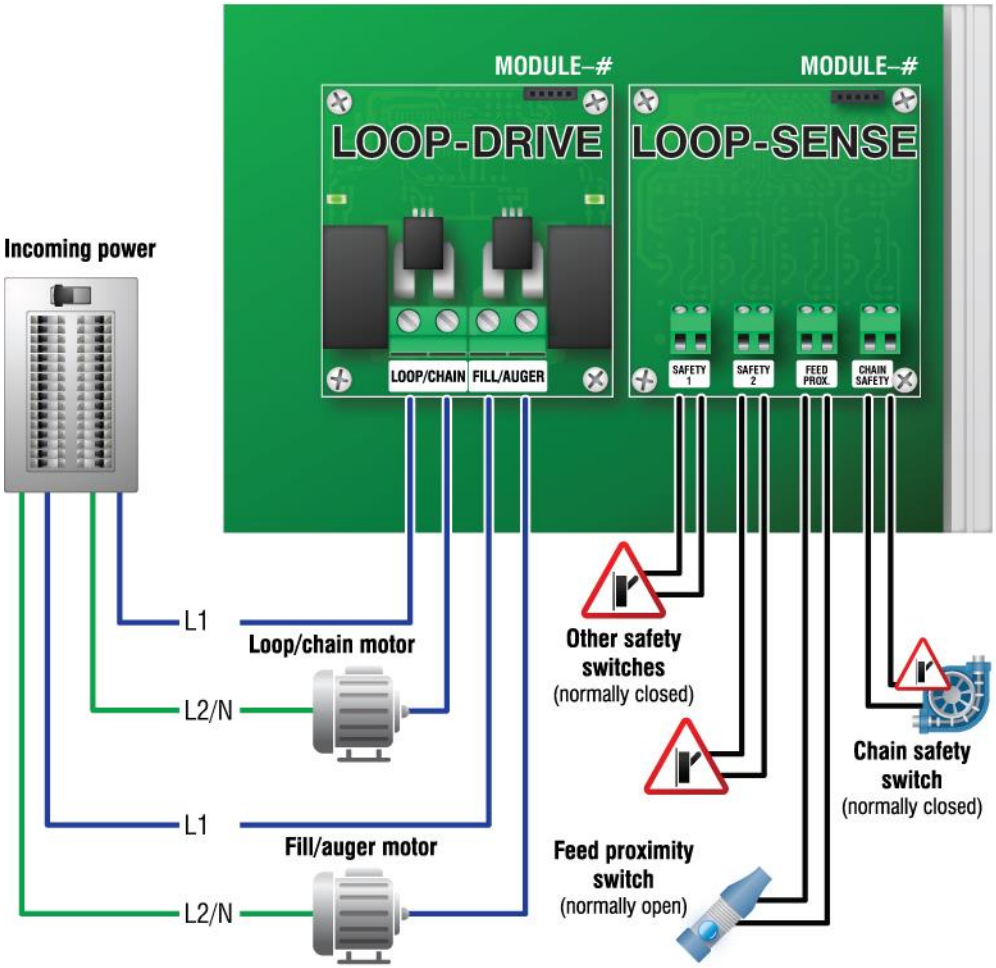
The disconnect relay for the variable frequency drive is a relay on an RM-4 module. Configure the relay to follow the variable DC output. For more information, refer to the online help at the AutoFlex Connect display.

Connecting equipment to Feed Loop Kits

The AutoFlex Feed Loop Kit **(model AFX-FEED-LOOP)** contains two modules specifically designed for controlling chain disk systems.

- The **Loop Drive** module controls the motors. There is one relay for the chain/drive motor and one for the auger/fill motor. Both relays include sensors for current monitoring.
- The **Loop Sense** module monitors the sensors. There are connections for feed proximity, chain safety, and two additional safety sensors.

The ratings of the equipment you connect must not exceed the ratings of the Loop Drive Module.	◇ 20 A at 120/230 VAC, general-purpose (resistive) ◇ 1 HP at 120 VAC, 2 HP at 230 VAC



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

Note: 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.

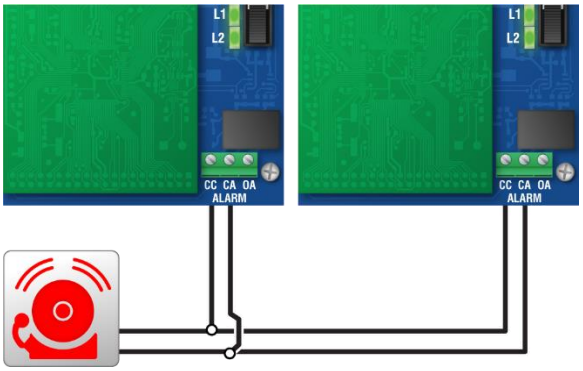
- ◇ 0.4 A at 125 VAC; 2 A at 30 VDC, resistive load
- ◇ 0.2 A at 125 VAC; 1 A at 30 VDC, inductive load

To connect a *normally open* alarm system

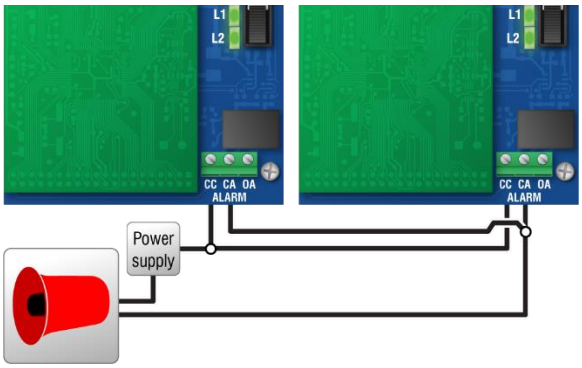
If you are connecting the alarm system to multiple AutoFlex Connects and your system uses a **normally open** connection (it closes when there is an alarm condition), connect the system as shown in the normally open diagram below.

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

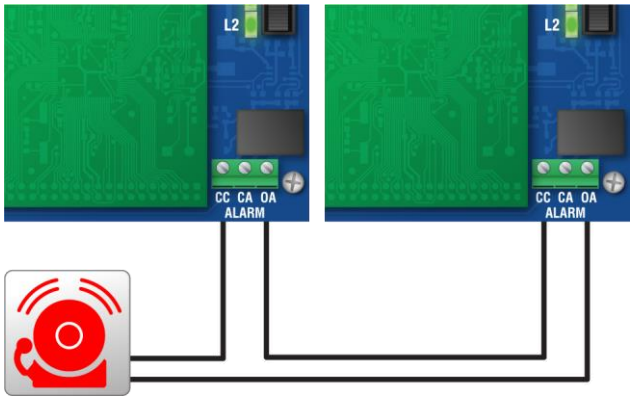


To connect a *normally closed* alarm system

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

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

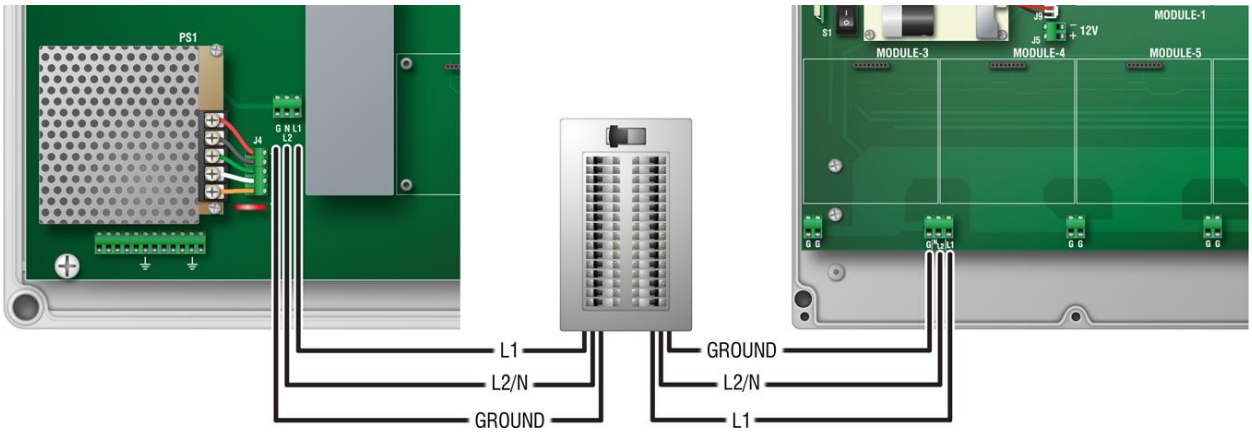


Connecting the power source

- ◇ 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.

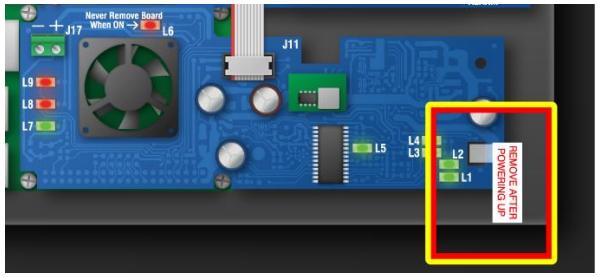


Finishing the installation

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 13.
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.

Immediately after powering up the control, remove the battery tab from the power supply on the back of the display.



Chapter 3: Overview of AutoFlex Connect

This chapter is a brief 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.

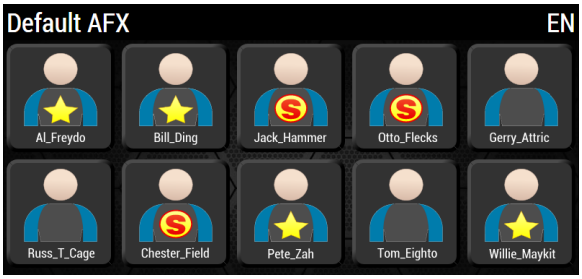
Getting started

Get started by creating a **Web Services account** at **phason.ca/webservices**. With a Web Services account, you can easily add a user to Connect controls by entering your account's email address. Web Services accounts also allow you to use the **Phason Connect** web and mobile apps.

Log in

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

Note The default PIN is **0000**.



Go through the screens

- The main menu [☰] allows you to access the screens required to set up the control: Structure, Configuration, and Administration
- The home icon [ ] takes you to the Home screen from any other screen.
- The green arrows scroll forward and backward through screens.

Configure the network

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

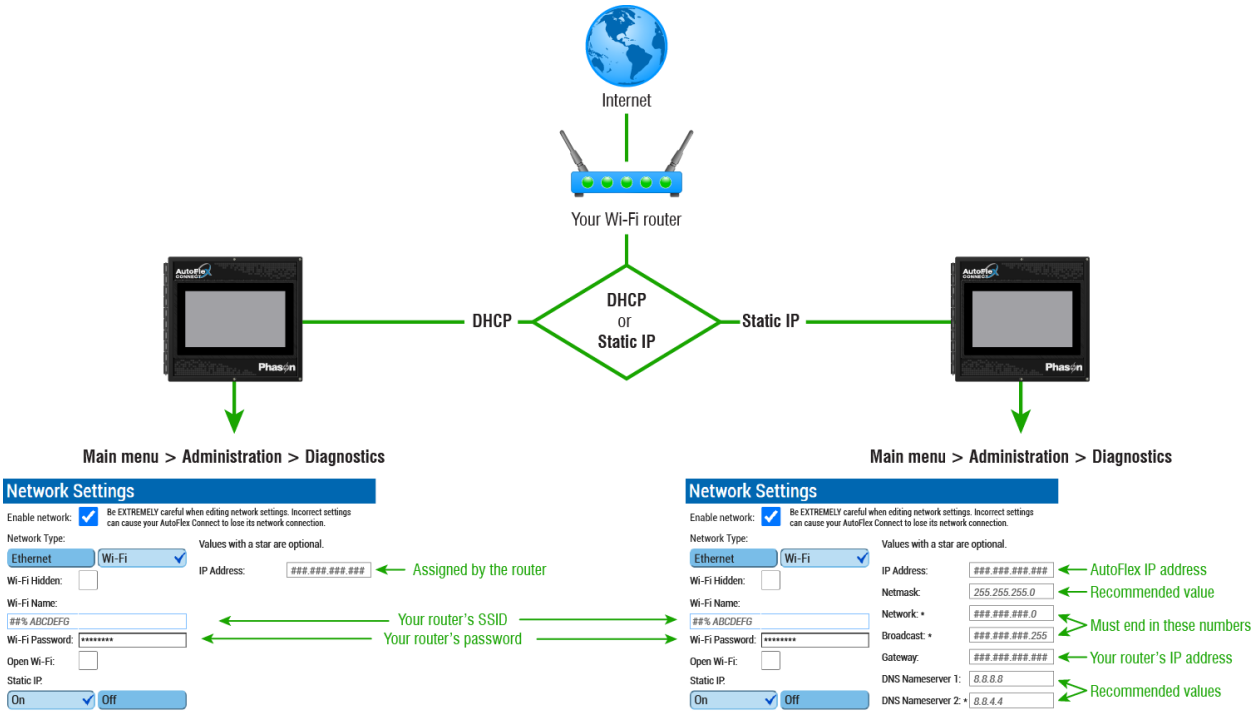
- Do you need to monitor your AutoFlex Connect remotely? If yes, do you want to monitor from on-site (within the building) or off-site (outside of the building or off the facility)?
- Do you want use traditional Ethernet (wired) for networking, or do you prefer the flexibility of wireless (Wi-Fi)?

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.

IP addressing method

Remote access requires AutoFlex Connect to have an IP address. The following diagram shows examples for dynamic (DHCP) and static IP addressing using Wi-Fi. If you are using wired networking, press Ethernet instead of Wi-Fi.


Internet
Your Wi-Fi router
DHCP
DHCP
or
Static IP
Static IP
Main menu > Administration > Diagnostics
Main menu > Administration > Diagnostics
Network Settings
Enable network:
Be EXTREMELY careful when editing network settings. Incorrect settings can cause your AutoFlex Connect to lose its network connection.
Network Type:
Ethernet
Wi-Fi
Values with a star are optional.
Wi-Fi Hidden:
IP Address:
###.###.###.###
Assigned by the router
Wi-Fi Name:
ABCDEFG
Wi-Fi Password:
Your router's SSID
Your router's password
Open Wi-Fi:
Static IP:
On
Off
Network Settings
Enable network:
Be EXTREMELY careful when editing network settings. Incorrect settings can cause your AutoFlex Connect to lose its network connection.
Network Type:
Ethernet
Wi-Fi
Values with a star are optional.
Wi-Fi Hidden:
Wi-Fi Name:
ABCDEFG
Wi-Fi Password:
Open Wi-Fi:
Static IP:
On
Off
IP Address:
###.###.###.###
AutoFlex IP address
Netmask:
255.255.255.0
Recommended value
Network: *
###.###.###.0
Broadcast: *
###.###.###.255
Must end in these numbers
Gateway:
###.###.###.###
Your router's IP address
DNS Nameserver 1:
8.8.8.8
DNS Nameserver 2: *
8.8.4.4
Recommended values

Notes for IP addressing

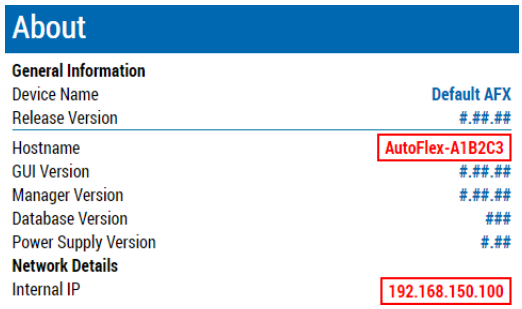
1. Choose your network IP method, **DHCP** or **STATIC**.
   - If your router has DHCP enabled, AutoFlex Connect does not require any additional settings.
   - If you will be using STATIC IP addressing, you need to assign a new **STATIC IP address** for your AutoFlex Connect to the router. See the information on the right side of the previous diagram.
2. After powering on the AutoFlex Connect, go to the Network Settings screen and then choose the type of network connection, **Wi-Fi** or **Ethernet**. For Wi-Fi, you need to enter the **SSID** and **Password**.
3. After you have entered all information, press **Save**. The control will restart and should connect to your network.

Remote access

Remote access allows you to easily monitor and control your AutoFlex Connect from remote devices, including desktop and laptop computers, tablets, and smartphones. There are two types of remote access: **on-site** and **off-site**. Off-site remote access requires an Internet connection, but on-site does not; both require you to configure the network on your control.

On-site connections

To connect from on-site, you need the IP address and hostname from the About screen.



In the example above, you would type `192.168.150.100?device=AutoFlex-A1B2C3` into the address bar of your browser. After connecting to your AutoFlex, create a "bookmark" or "favorite". On a computer you can do this by pressing CTRL+D on your keyboard.

Exact capitalization of the hostname is required. If you see the following message, you have typed the host's name incorrectly.

Please check your device name or refresh to try again (CTRL+F5).

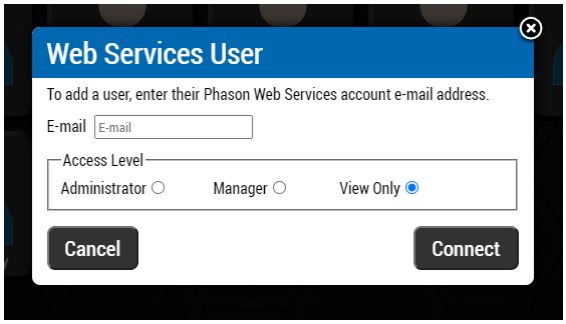
Off-site connections

After you have configured the network and restarted your AutoFlex Connect, it will be available remotely. The two best ways to connect from off-site are:

- **Phason web services site:** https://www.phason.ca/webservices/WebservicesLogin.php
- **Phason devices app:** available from Google Play or Apple App Store.

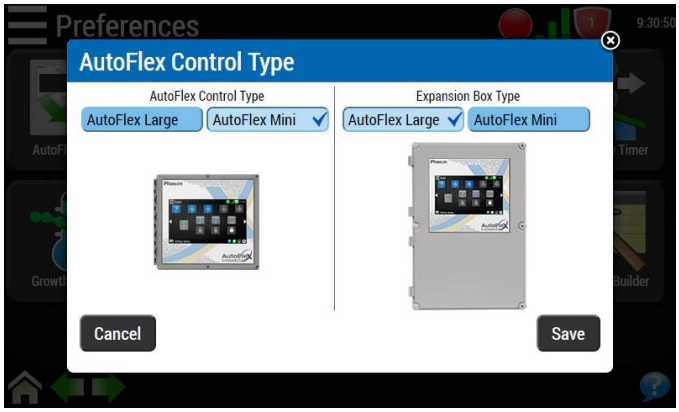
Create users

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



Select the AutoFlex type

At the Administration screen, press **Preferences** and then **AutoFlex Type**. If you have an Expansion Box connected, select the type for that as well.

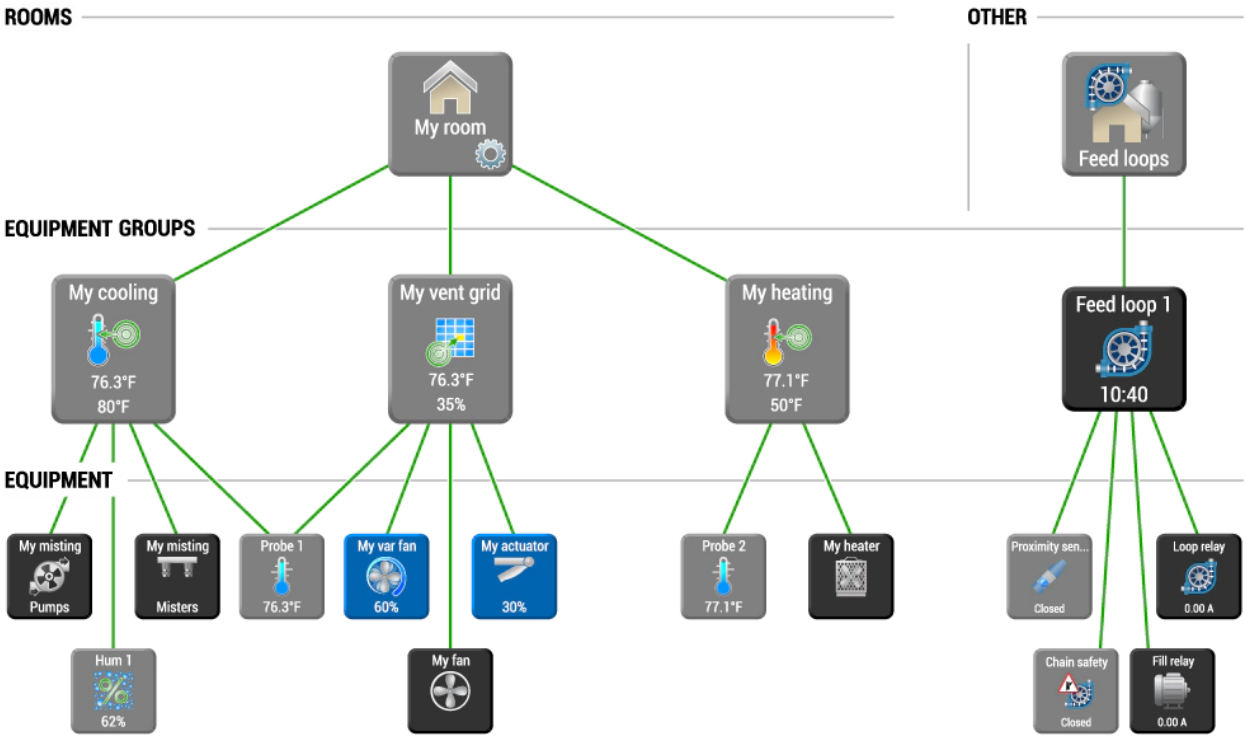


Select the units of measure

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

Create rooms and equipment groups

Rooms and equipment groups make up the structure of your building or site. Rooms contain equipment groups. Equipment groups contain equipment.



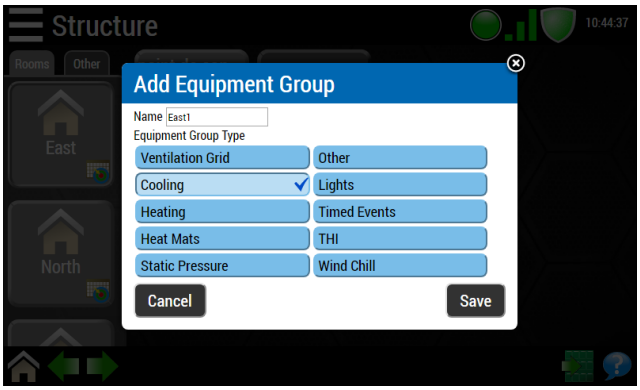
For more specific help, press the help icon [ ].

Rooms

1. Use the menu to go to the Structure screen and then press Rooms.
2. Press the add new room icon [ ].

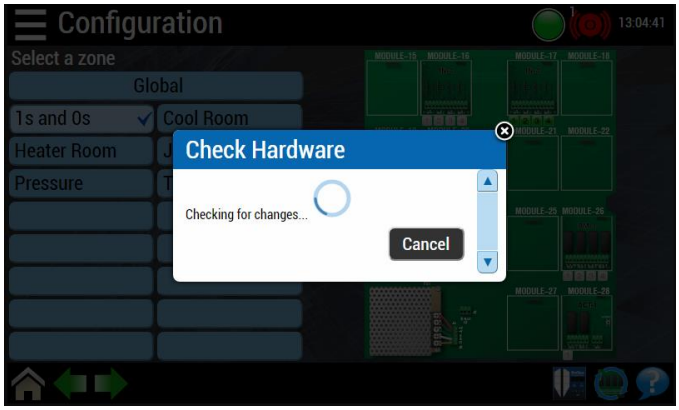
Equipment groups

1. Press one of the rooms.
2. Press the add equipment group icon [ ].



Check for modules

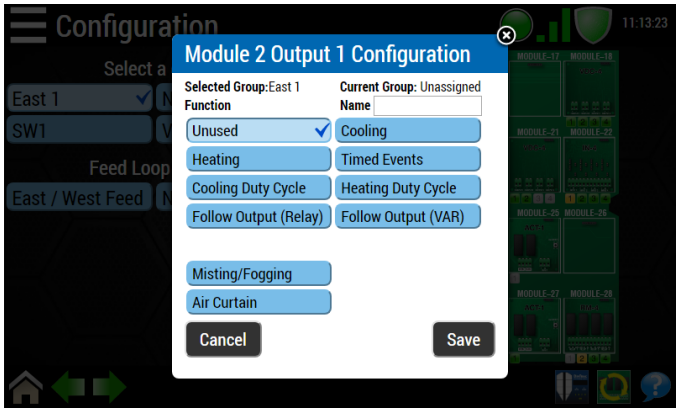
Use the menu to go to the Configuration screen and then press the refresh hardware icon [ ].



The control will check each module position to see if a module is installed in it and what type of module it is. The process can take several minutes. The results should match what is installed in the control. If it does not, repeat the process.

Assign equipment to groups

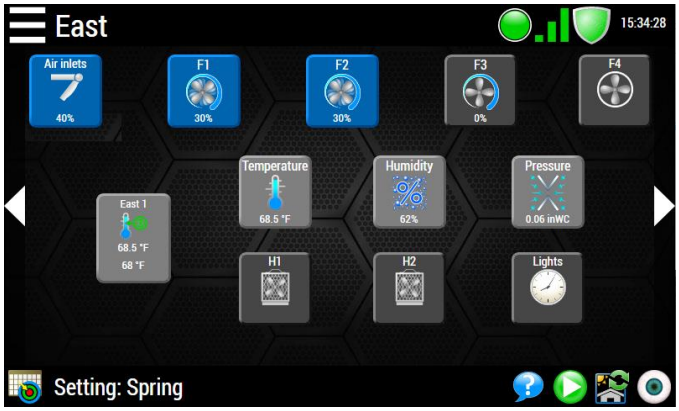
1. At the Configuration screen, press one of the groups.
2. Press the module with the hardware you want to assign.
3. Press the number for the input/output.



Arrange the Home screen

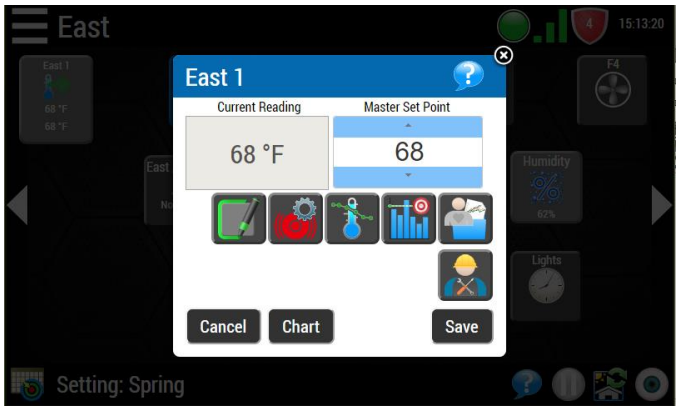
The Home screen scrolls through each room. Each room has its own screen. Press the left or right arrows to change screens.

- You can pause [ ] or scroll [ ] through the room screens.
- You can select from the included backgrounds [ ]. You can also upload your own in the Preferences screen.
- You can drag and drop equipment icons to arrange them. Press an icon, wait a second, and then move it where you want it.



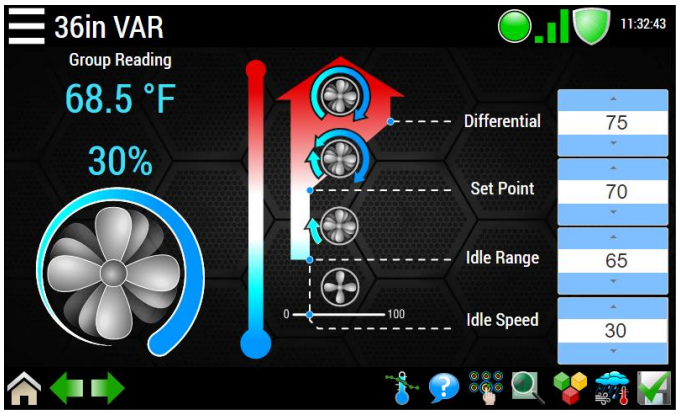
Adjust master set points

At the Home screen for the room you want to adjust, press the room management icon [ ].



Adjust equipment settings

1. At the Structure screen, press Rooms.
2. Press the room and the group that has the equipment you want to adjust.
3. Press the equipment you want to adjust.
4. Press the settings icon [ ].



Appendix A: Troubleshooting

Some solutions in the table refer to repair kits. For more information about kits, read **Appendix C: Additional modules and repair kits** on page 45.

Before servicing the control, switch OFF the power at the source.

Problem(s)	Possible cause(s)	Possible solution(s)
	Modules and equipment	
A relay does not switch on its load.	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 **Connecting equipment to ACT-1, ACT-1T, and ACT-1V** modules on page 15.
Power supply components are blown out. There are burn marks on boards and components. Motors and fans slow down or stop.	There is/was a power surge, brownout, or power outage.	Avoid the problem in future by providing proper voltage and protection for the control. Replace any damaged circuit boards with a kit.
The alarm relay is not operating the alarm system.	The wiring is incorrect	Correct the wiring. For more information, read **Connecting an alarm system** on page 27.
The inputs are showing default values; the outputs are not responding as expected	There is a module communication problem.	Follow **Troubleshooting module communication** on page 41.
	General and display	
There is no display, no LEDs light up.	There is no power to the control.	Switch on the power or reset the breaker.
	The input power is not correct.	Measure the incoming AC voltage. The voltage must be 85 to 264 VAC, 50/60 Hz.
	The main power supply is damaged.	If input voltage is correct, replace power supply with the kit for the model of control you have.
	The display power supply battery is low or dead.	The battery needs to charge enough for the display to switch on. For more information, read **Display Controller states and statuses** on page 42.

Problem(s)	Possible cause(s)	Possible solution(s)
There is no display (the screen is blank), but there is power to the rest of the control.	The HDMI cable is loose or disconnected.	Unplug and then reconnect the cable. For more information, see **AutoFlex layout** on pages 13 and 14.
	The ribbon cables are loose or disconnected.	Connect all ribbon cables. For more information, see **AutoFlex layout** on pages 13 and 14.
	The display controller is damaged.	Replace the controller board with kit KAFXC-DCONTROL2.
	The PHASON USB drive has exceeded its life.	Replace the drive. Contact your dealer or Phason for more information.
	The display power supply battery is low or dead.	The battery needs to charge enough for the display to switch on. For more information, read **Display Controller states and statuses** on page 42.
	The single board computer cannot read from the microSD card.	Replace the microSD card with kit KAFX-UPDATE. For more information, see **Display Controller states and statuses** on page 42.
Nothing happens when you press the screen.	The USB cable is loose or disconnected.	Unplug and then reconnect the cable. For more information, see **AutoFlex layout** on pages 13 and 14.
	The ribbon cables are loose or disconnected.	Unplug and then reconnect all ribbon cables. For more information, see **AutoFlex layout** on pages 13 and 14.
	The Display Controller is damaged.	Replace the Display Controller with kit KAFXC-DCONTROL2.
Controller board LED L1 (green) is not on and/or bottom board LED PWR (red) is not on.	The ribbon cables are loose or disconnected.	Unplug and then reconnect all ribbon cables. For more information, see **AutoFlex layout** on pages 13 and 14.
	There is no power to the board.	Confirm the input power to the Autoflex is connected.
	The Display Controller is damaged.	Replace the Display Controller with kit KAFXC-DCONTROL2.
	There has been a database failure.	Use the Repair + Restore function. If the repair and restore does not work, contact Phason.

Troubleshooting module communication

When the modules are communicating properly with the Communication Controller, the following module LEDs should be flashing approximately once per second.

Module	LED	Module	LED	Module	LED	Module	LED
◇ ACT ◇ ACT-1V ◇ VCM-DC	L3	◇ IN-4 ◇ LOOP-SENSE ◇ VDC-4	D1	◇ ACT-1T ◇ RM-2 ◇ RM-2-3PH ◇ LOOP-DRIVE ◇ RM-4	L5	VAC-1	LED1

- The LED is **flashing quickly**
  the module cannot communicate with the Communication Controller.
- The LED is **on constantly**
  There is a damaged or incorrectly installed module.
  OR there was a problem with the last update. Reinstall the update to try to resolve the problem.
- The LED is **off**
  The module is not connected properly or is damaged.

Communication statistics

The communication statistics show how often a module communicates successfully with the Communication Controller. The ideal values are at or close to 100%. If the values are less than 90%, communication is considered poor.

1. Press menu > **Configuration**.
2. Press the view statistics icon. []
3. Press the reset statistics icon. []
4. Press the refresh statistics icon. [] Observe the modules' communication LEDs each time you refresh the statistics to help you identify any problem modules.

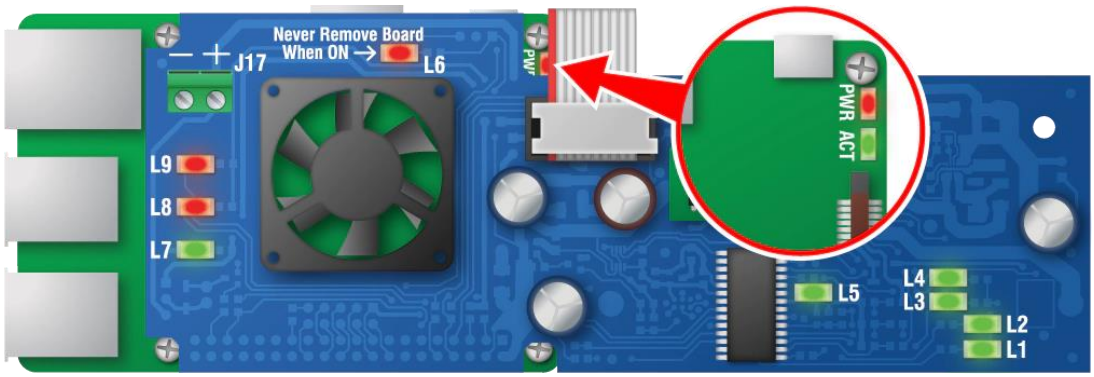
Causes and possible solutions for communication problems

Poor communication can be caused by a module that is damaged or not connected properly. To see if this is the problem, remove and then reconnect the module. Shut down the control by following the **Proper shutdown procedure** on page 43.

Another possible cause is a wiring issue; for example, running low and high voltage wiring in the same conduit. Verify that low and high voltage wiring are in separate conduits and not running too close to each other.

If no modules are communicating, there is likely a problem with the Communication Controller or the mounting board.

Display Controller states and statuses



State	LED status	Description
		Power supply
1	**L1** ON **L2** OFF	◇ AC power is normal. ◇ **If AC power fails, go to State 2.**
2	**L1** OFF **L2** ON	◇ The system is shutting down because of an AC power failure. ◇ **If a halt signal is detected, go to State 3.** **Special case:** If there is no halt signal after 10 minutes, **State 2** changes to **State 3** after 10 seconds of **L1** and **L2** blinking slowly. This is a *hard shutdown*, where power to the display controller is cut off. This could cause file corruption.
3	**L1** ON **L2** ON	◇ There is no power to the display controller. ◇ **If AC power is good, go to State 1**
4	**L1** and **L2** blink QUICKLY, at the same time	◇ The power supply is changing between **State 1**, **State 2**, and **State 3**. Change from: **State 1** to **State 2** for 10 seconds **State 2** to **State 3** for 30 seconds **State 3** to **State 1** for 10 seconds
5	**L1**, **L2**, and **L5** blink QUICKLY, at the same time, for 5 seconds	◇ The power supply is resetting.
A	**L3** ON	◇ The battery is fully charged.
B	**L4** ON	◇ The battery is charging.
C	**L6** ON	◇ There is power to the display controller. DO NOT remove the power supply.
D	**L6** OFF	◇ There is no power to the display controller; it is safe to remove the power supply.
E	**L7** ON	◇ There is AC power to the power supply.
		Single board computer (SBC)
6	**PWR ON** **ACT OFF or ON solid**	◇ The SBC has power but cannot read from the microSD card.
F	**PWR ON**	◇ The SBC has power.
G	**ACT** blinking	◇ The SBC is communicating.

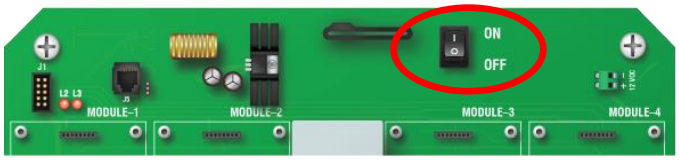
Proper shutdown procedure

Always follow this procedure to properly shut down your AutoFlex Connect before doing any service.

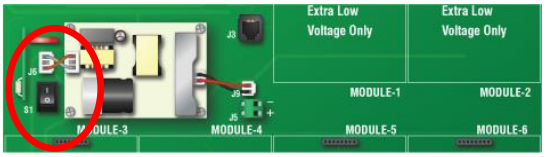
1. Press Menu > **Administration** > **Diagnostics** > **Shut Down Display**.

   If the display does not respond or is damaged, place the switch on the module mounting board in the **OFF** position.

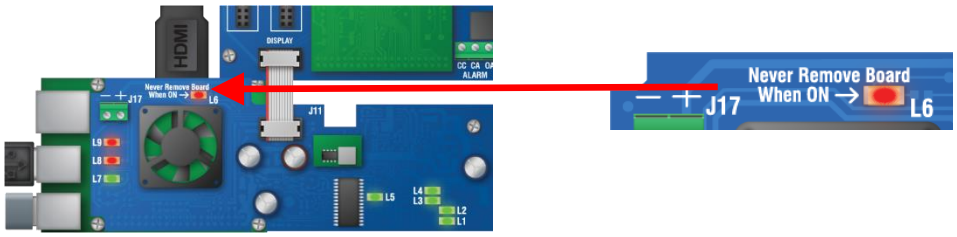
Large AutoFlex Connect



AutoFlex Connect Mini



2. Wait for the display to shut down. The display has shut down when **LED L6** on the display power supply is off.



Before servicing the control, switch OFF the power at the source.

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 (like 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** below.

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 Ω.
5. Measure and record the resistance between wires 1 and 2. _____ Ω
6. Measure and record the resistance between wires 1 and 3. _____ Ω

7. Measure and record the resistance between wires 2 and 3. _____ Ω
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.phason.ca.

Additional modules

ACT-1

Actuator Module

- One open and one close relay
- Potentiometer feedback input

ACT-1T

Actuator Module

- One open and one close relay
- Current sensing
- Uses timed feedback

ACT-1V

Actuator Module

- One open and one close relay
- 0 to 10 V DC feedback input

IN-4

Input Module

- Connections for four sensors

RM-2

Relay Module, current sensing

- Two high-capacity, general-purpose relays
- Current sensing

RM-2-3PH

Three-Phase Relay Module, current sensing

- Two high-capacity, general-purpose relays
- Two pilot relays
- Current sensing

RM-4

Relay Module

- Four general-purpose relays

VAC-1

Variable AC Module

- One variable output
- Current sensing
- Temperature probe connector
- Variable Load Expansion Box connection

VDC-4

Variable DC Module

- Four 0 to 10 V DC signal outputs

VCM-DC

Variable Chimney Module (DC)

- Two 0 to 10 V DC signal outputs

One measuring fan input

AFX-FEED-LOOP

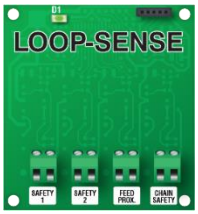
Feed Loop Kit

LOOP-DRIVE module

- Relays for chain/drive and auger/fill motors
- Current sensing

LOOP-SENSE module

- Inputs for proximity sensor, chain sensor, and two additional sensors



Replacement parts and repair kits

KAFXC-DCONTROL2

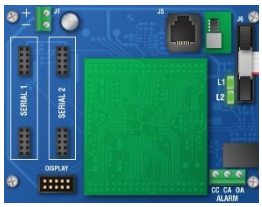
AutoFlex Connect II display controller kit

- For AutoFlex Connect II and Connect II Mini
- Includes controller, USB drives, and controller power supply

KAFXC2-COM

Communication board

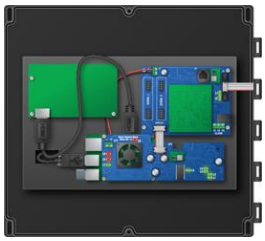
- For AutoFlex Connect II and Connect II Mini
- Alarm relay



KAFXMC2-DISPLAY

AutoFlex Connect II Mini display kit

- A complete cover and display
- Includes all cables



HDMI-1FT

HDMI cable, 1 foot

- For AutoFlex Connect II and Connect II Mini
- Connects the display controller to the display

KAFXC2-DISPLAY

AutoFlex Connect II display kit

- A complete cover and display
- Includes all cables

KAFX-RIBBON

Ribbon cable is, 10 inches

- For AutoFlex Connect II only
- Connects the communication board to the mounting board

KAFXM-RIBBON

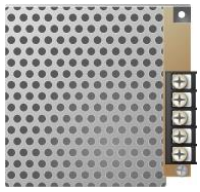
Ribbon cable, 5 inches

- For AutoFlex Connect II Mini only
- Connects the communication board to the mounting board

KAFX-POWER

Power supply, 35 W

- For AutoFlex Connect II only



KAFXM-POWER

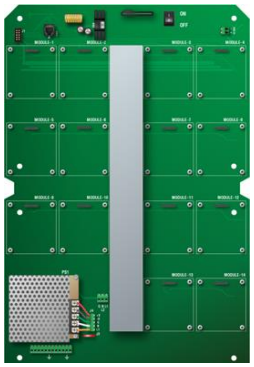
Power supply, 25 W

- For AutoFlex Connect II Mini only

KAFX-MOUNTING

AutoFlex Connect II mounting board

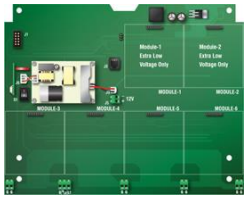
- For AutoFlex Connect II only
- Includes 35 W power supply



KAFXM-MOUNTING

AutoFlex Connect II Mini mounting board

- For AutoFlex Connect II Mini only
- Includes 25 W power supply



Limited warranty

This warranty applies only to Phason AutoFlex Connect II controls (AUTOFLEX). If you need warranty service, return the product and original proof of purchase to your dealer.

Phason Inc. (Phason) warrants the AUTOFLEX subject to the following terms and conditions.

This warranty is valid only to the original purchaser of the product, for two years from the manufacturing date. The manufacturing date is stated in the first eight digits of the serial number in the form year-month-day.

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.
- The person requesting warranty service must be the original purchaser of the unit, and provide proof of purchase upon request.
- All transportation charges for products submitted for warranty must be paid by the purchaser.

Except to the extent prohibited by applicable law, no other warranties, whether expressed or implied, including warranties of merchantability and fitness for a particular purpose, shall apply to the control. Any implied warranties are excluded.

Phason is not liable for consequential damages caused by the AUTOFLEX.

Phason does not assume or authorize any representatives, or other people, to assume any obligations or liabilities, other than those specifically stated in this warranty.

Phason reserves the right to improve or alter the AUTOFLEX without notice.

Service and technical support

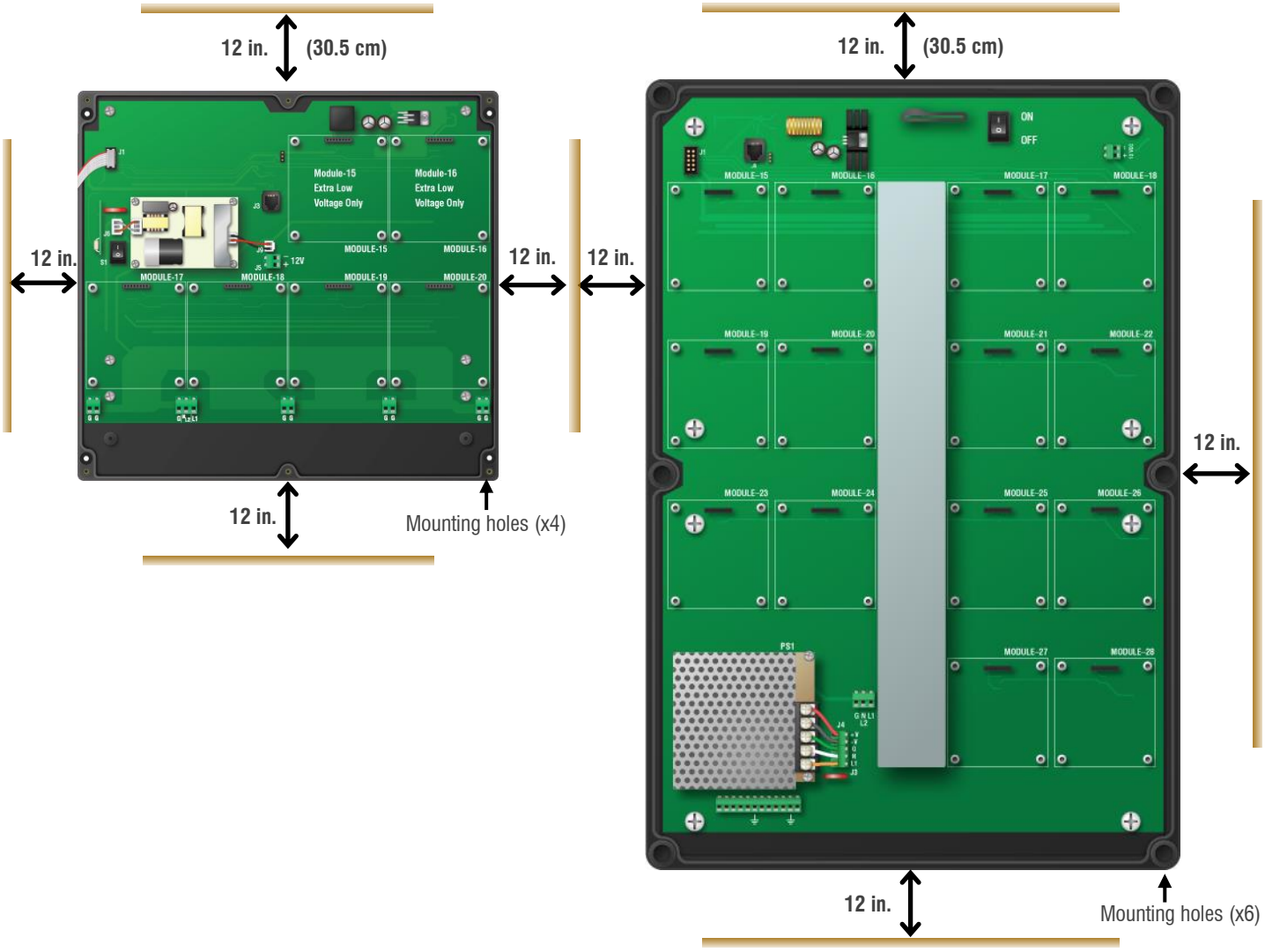
Phason will be happy to answer all technical questions that will help you use your AutoFlex Connect. Before contacting Phason, check the following:

- Read this guide for information about the feature with which you are having trouble.
- If you are having a problem using your AutoFlex Connect, look in **Appendix A: Troubleshooting** on page 39, and then follow the directions for correcting the problem.
- If you still have a problem with your AutoFlex Connect, collect the following information:
  - The serial number
  - Any messages displayed by your AutoFlex Connect
  - A description of the problem
  - A description of what you were doing before the problem occurred

- ◇ Phason controls are designed and manufactured to provide reliable performance, but they are not guaranteed to be 100 percent free of defects. Even reliable products can experience occasional failures and the user should recognize this possibility.
- ◇ If Phason products are used in a life-support ventilation system where failure could result in loss or injury, the user should provide adequate back up ventilation, supplementary natural ventilation, or an independent failure-alarm system. The user's lack of such precautions acknowledges their willingness to accept the risk of such loss or injury.

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.



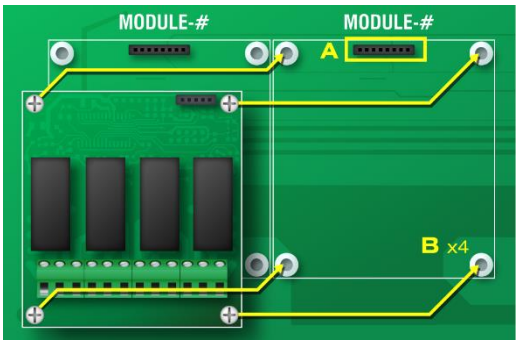
Note

For the larger AutoFlex Connect:

- ◇ Mount high-voltage modules (ACT-1, ACT-1T, ACT-1V, RM-2, RM-2-3PH, RM-4, VAC-1, and LOOP-DRIVE) next to the trough, and then run the cabling through the trough.
- ◇ Mount low-voltage modules (IN-4, VDC-4, VCM-DC, and LOOP-SENSE) at the outer positions and run the cabling along the inside of the enclosure.

Installing modules

1. Position the module over the connector (A) and then press straight on to the connector.
2. Fasten the module in place using **all four screws** (B) provided.

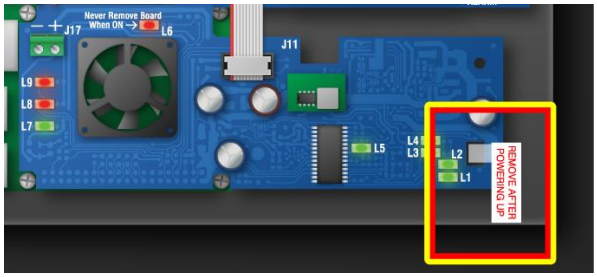


Electrical ratings

Control power	85 to 264 VAC, 50/60 Hz
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
ACT-1 **ACT-1V**	15 A at 120/230 VAC, general-purpose (resistive) 1/2 HP at 120 VAC, 1 HP at 230 VAC 0-10 V DC signal feedback (ACT-1V only)
ACT-1T **LOOP-DRIVE** **RM-2**	20 A at 120/230 VAC, general-purpose (resistive) 1 HP at 120 VAC, 2 HP at 230 VAC
RM-2-3PH	1 HP at 120 VAC, 2 HP at 230 VAC 230 VAC coil, 70 VA inrush, pilot duty
RM-4	15 A at 120/230 VAC, general-purpose (resistive) 1/2 HP at 120 VAC, 1 HP at 230 VAC
VAC-1	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
VCM-DC **VDC-4**	0 to 10 VDC, 2K Ω load

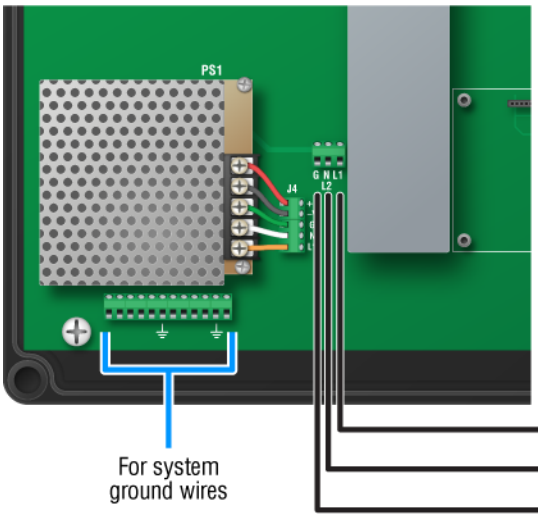
- ◇ You can connect more than one piece of equipment to a variable stage or relay if they are the same type (such as fans) and the total current draw and horsepower does not exceed the limit.
- ◇ The maximum wire gauge for all terminals is 12 AWG, solid or stranded.

- ◇ Immediately after powering up the control, remove the battery tab from the power supply on the back of the display.

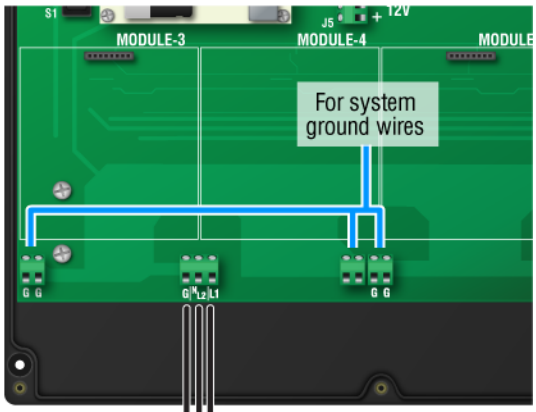


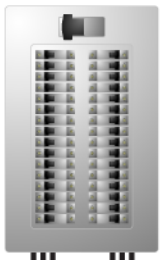
Incoming power

AutoFlex



AutoFlex Mini





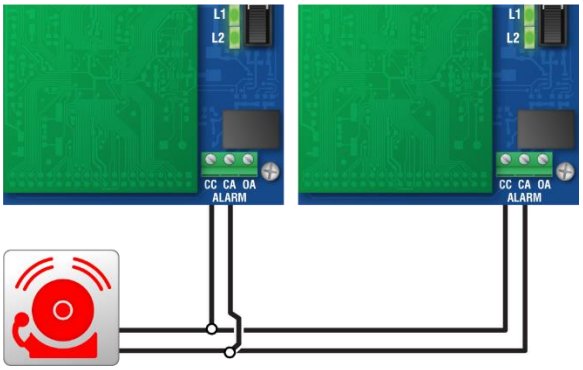
L1
L2/N
GROUND

GROUND
L2/N
L1

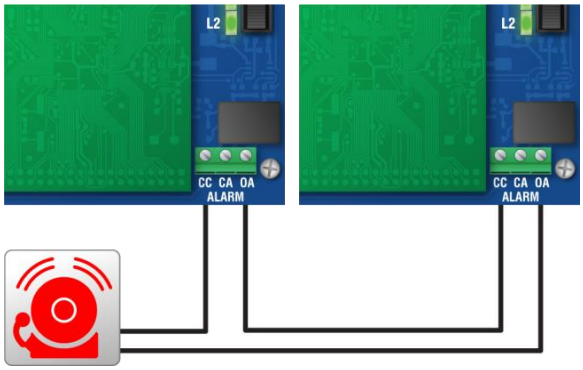
Alarm relay

Each AutoFlex control has an alarm relay connection on the inside of the cover. For complete installation information, read **Connecting an alarm system** in the **AutoFlex Connect II installation guide**.

Normally open alarm system



Normally closed alarm system

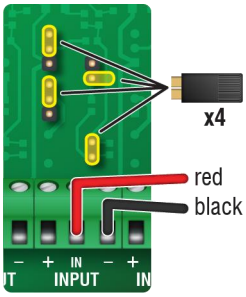


Input Module

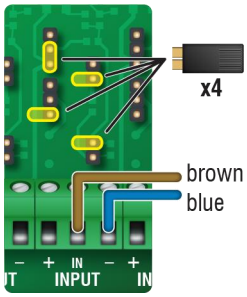
The IN-4 is a Smart Module that has connections for four analog sensors, dry contact switches, or dry contact pulse outputs. For complete installation information and a list of supported sensors, read **Connecting sensors to IN-4 modules** in the **AutoFlex Connect II installation guide**.

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

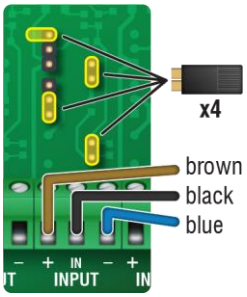
3K Series



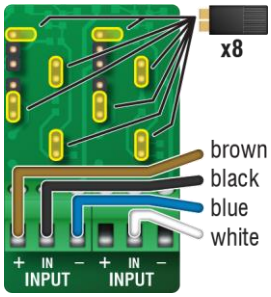
DOL15



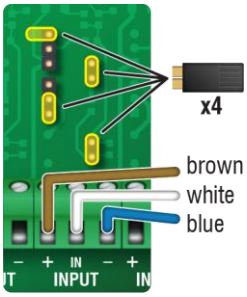
DOL114 temp. only



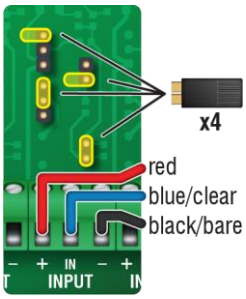
DOL114 temp. and hum.



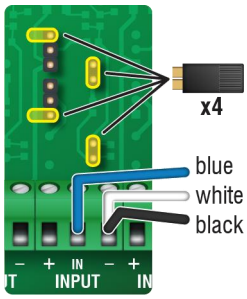
DOL114 hum. only



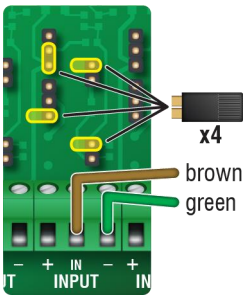
RHS



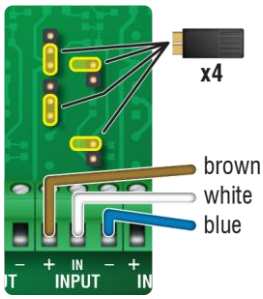
DOL19



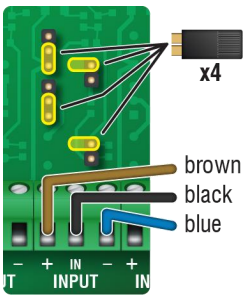
DOL53



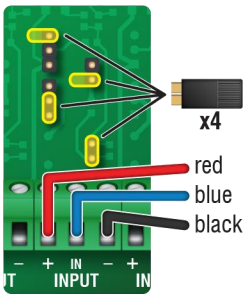
DOL16, 100 lux



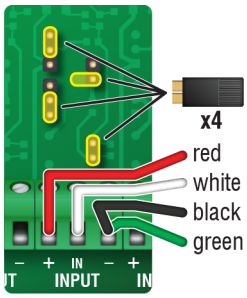
DOL16, 1000 lux



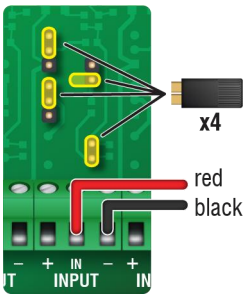
SPS-2



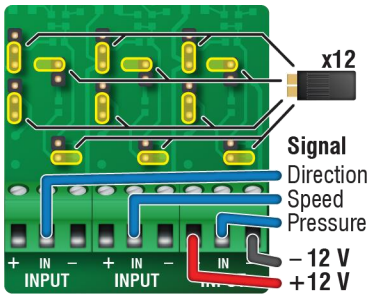
PRS



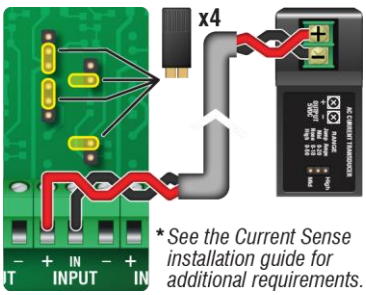
WINDSPEED-03



DOL58

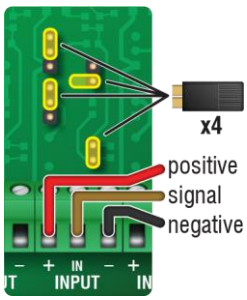


CURRENTSENSE-2

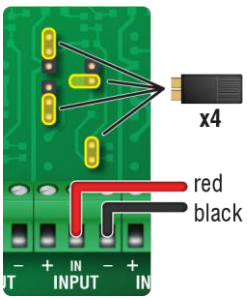


*See the Current Sense installation guide for additional requirements.

Dry contact pulse output



Dry contact digital switch



RM-2, RM-2-3PH, and RM-4 modules

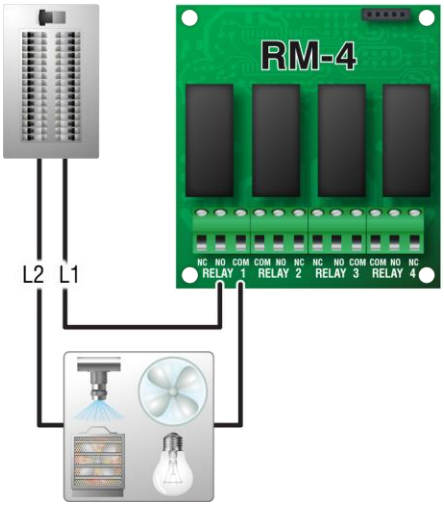
The RM-2, RM-2-3PH, and RM-4 are Smart Modules that precisely control the equipment connected to them.

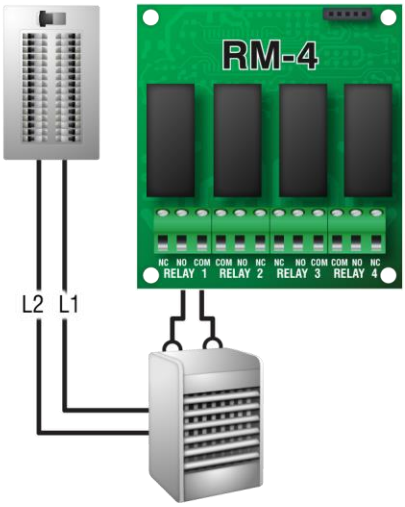
- The **RM-2** has two high-capacity relays. Each relay has an integrated current sensor.
- The **RM-2-3PH** has two high-capacity relays and two pilot relays for controlling three-phase motors and equipment. The relays operate as pairs, with one high-capacity and one pilot relay in each pair. The high-capacity relays each have an integrated current sensor.
- The **RM-4** has four relays. The RM-4 *does not have* current sensors.

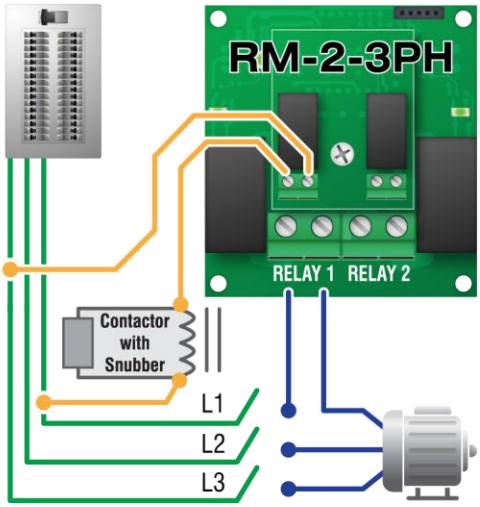
For complete installation information, read **Connecting equipment to RM-2, RM-2-3PH, and RM-4 modules** in the **AutoFlex Connect II installation guide**.

Note

Wiring instructions are the same for the RM-2 and the RM-4 Relay Modules. The following examples use the RM-4.







ACT-1, ACT-1T, and ACT-1V modules

Actuator Modules are Smart Modules that have one OPEN and one CLOSE relay specifically for actuator and curtain control. The ACT-1 uses potentiometer feedback ACT-1T uses timed feedback, and ACT-1V uses 0-10 V DC-signal feedback.

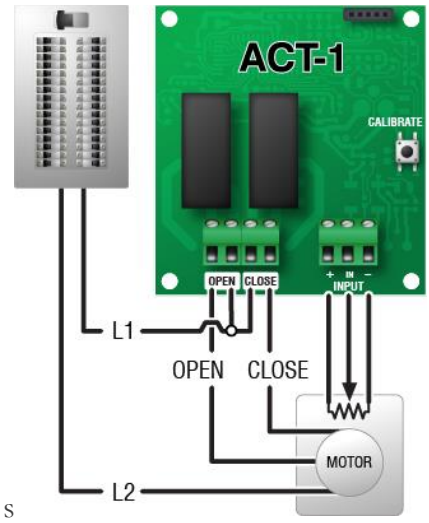
For complete installation information, read **Connecting equipment to ACT-1, ACT-1T, and ACT-1V modules** in the **AutoFlex Connect II installation guide**.

Note

- ◇ Do not run actuator feedback wires 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** in the **AutoFlex Connect II installation guide**.
- ◇ 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.

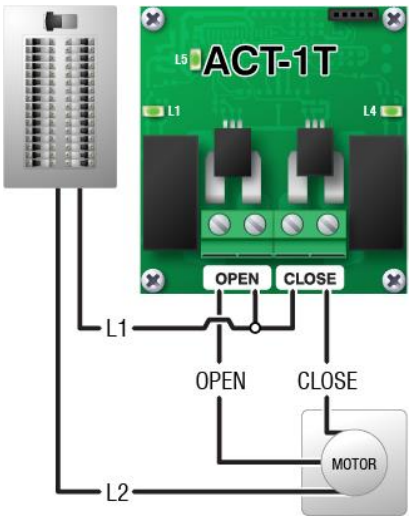
AC-powered actuators

Potentiometer feedback

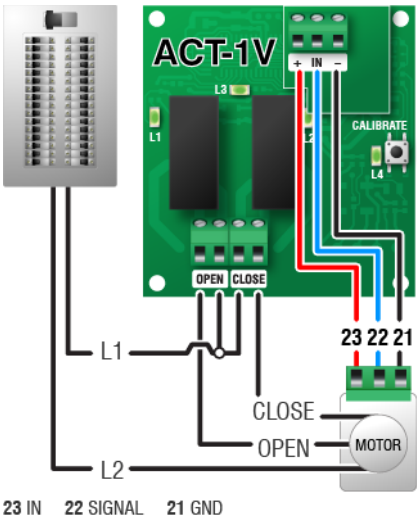


S

Timed feedback

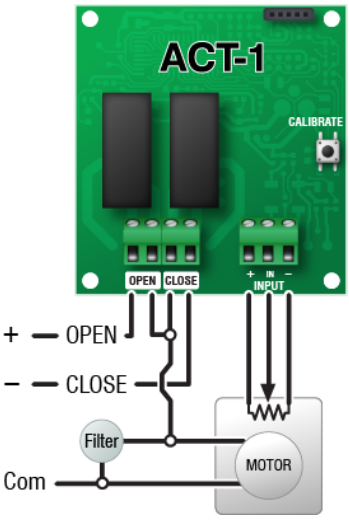


0-10 V DC signal feedback

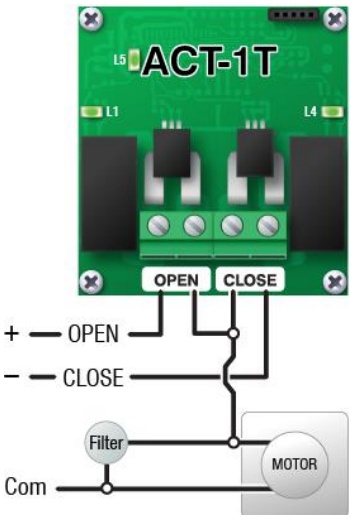


DC-powered actuators

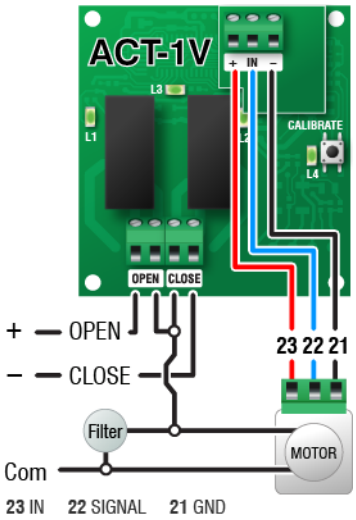
Potentiometer feedback



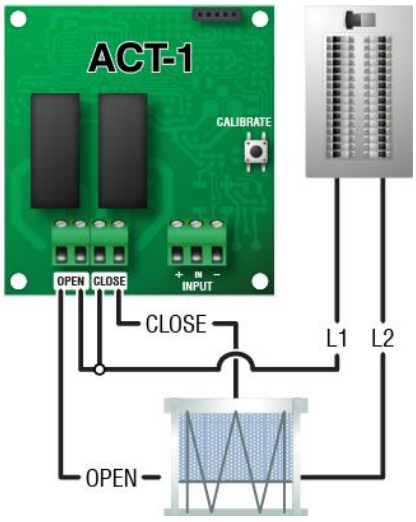
Timed feedback



0-10 V DC signal feedback



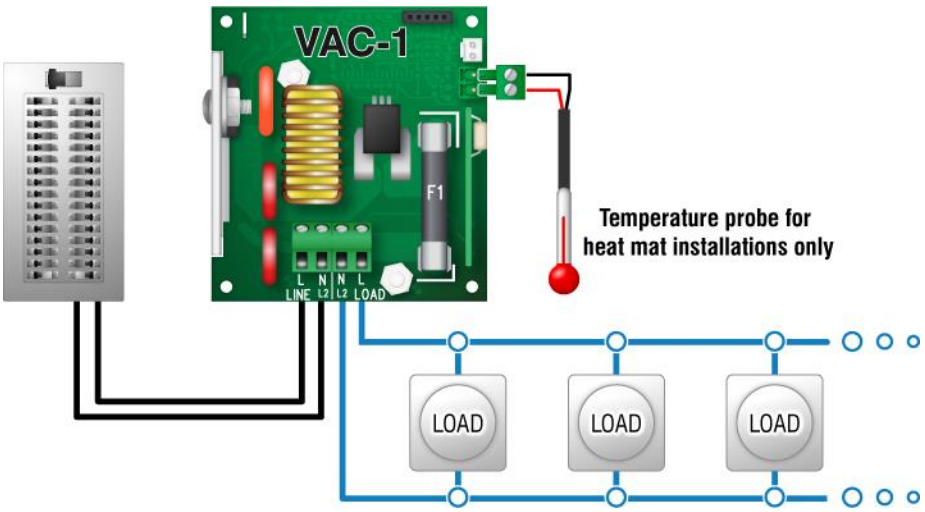
Curtain machines



VAC-1 module

The VAC-1 is a single-output Smart Module with a **current sensor** that can control variable-speed fans, heat mats, and lights. A temperature probe connector is included for heat mat control. For complete installation information, read **Connecting equipment to VAC-1 modules** in the **AutoFlex Connect II installation guide**.

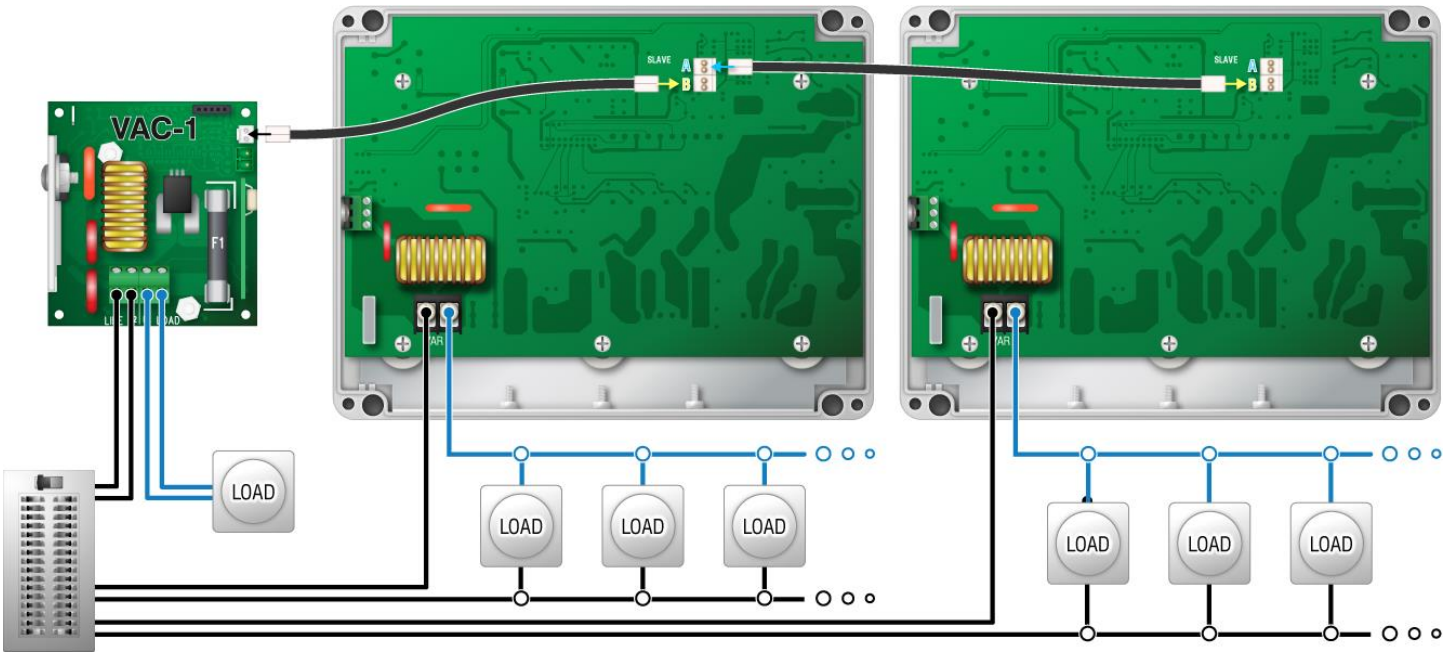
Heat mats



VLX-20 Variable Load Expansion Box

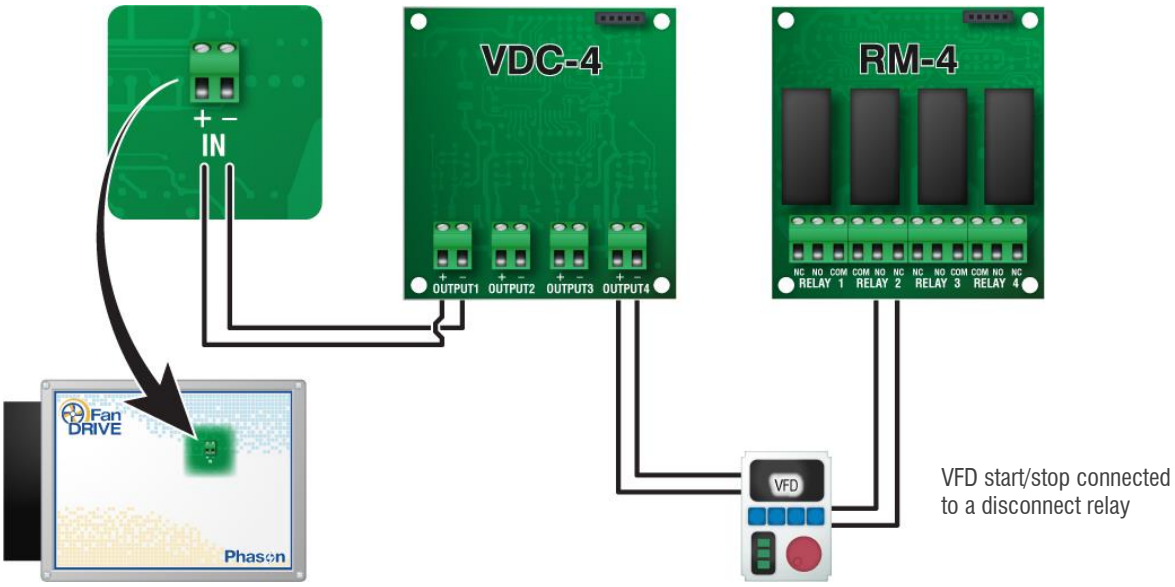
The VLX-20 has a 20 A variable AC stage that allows you to increase the capacity of the VAC-1. The VLX-20 is ideal for controlling loads such as heat mats, heat lamps, and incandescent lights.

The VAC-1 and VLX-20 **must** be on the same phase.



VDC-4 module

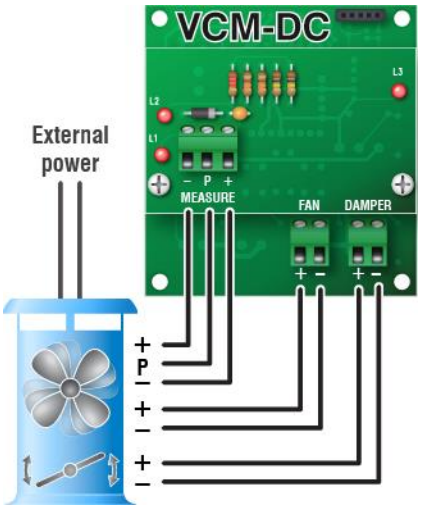
The VDC-4 is a Smart Module that has four outputs for controlling variable frequency drives (VFD), FanDRIVEs, or other equipment requiring a 0 to 10 V DC signal. For complete installation information, read **Connecting equipment to VDC-4 modules** in the **AutoFlex Connect II installation guide**.



> **Note** 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.

VCM-DC module

The VCM-DC is a Smart Module that monitors and precisely controls airflow using a chimney fan, damper, and measuring fan. For complete information, read **Connecting equipment to VCM-DC modules** in the **AutoFlex Connect II installation guide**.

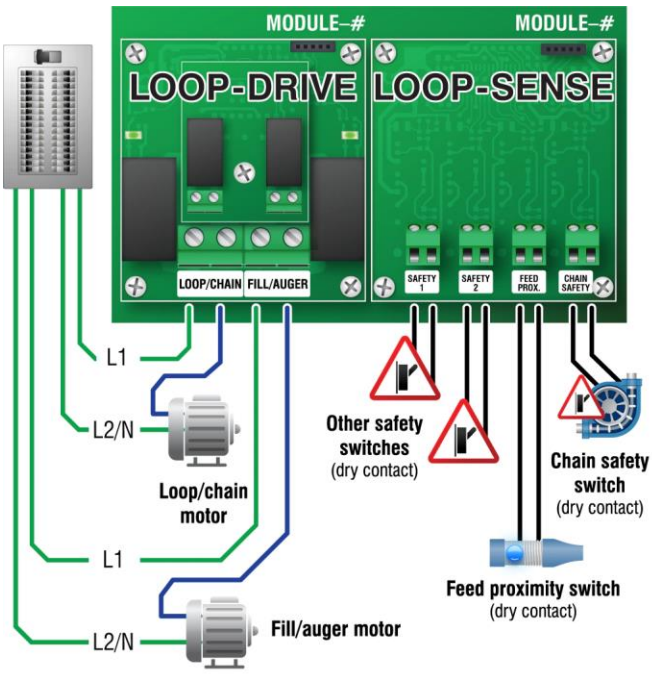


Feed Loop Kit

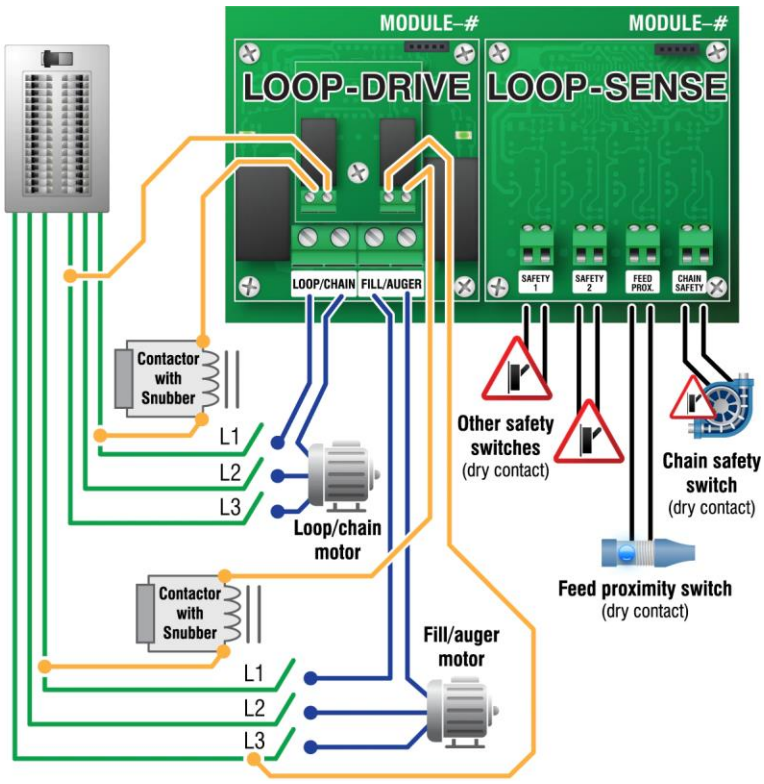
The Feed Loop Kit contains two Smart Modules specifically designed for controlling chain disk systems. For complete installation information, read **Connecting equipment to Feed Loop Kits** in the **AutoFlex Connect II installation guide**.

- The **Loop Drive** module controls the motors. There is one relay for the chain/drive motor and one for the auger/fill motor. Both relays include sensors for current monitoring.
- The **Loop Sense** module monitors the sensors. There are connections for feed proximity, chain safety, and two additional safety sensors.

Single phase



Three-phase



Get started with AutoFlex Connect

Get started with AutoFlex Connect by creating a **Web Services account** at **www.phason.ca/webservices**. With a Web Services account, you can easily add a user to Connect controls by entering your account's email address. Web Services accounts also allow you to use the **Phason Connect** web and mobile apps.

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Fax: 204-233-3252

E-mail: support@phason.ca
Web site: www.phason.ca

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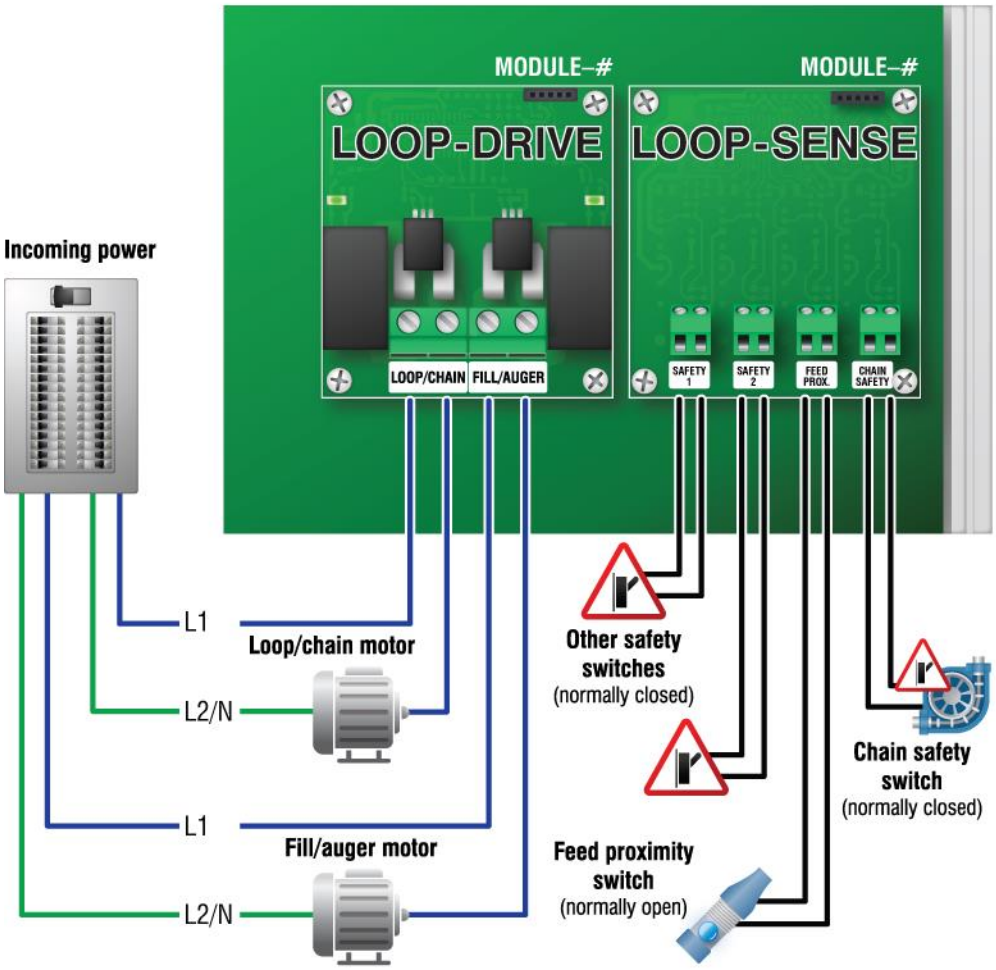

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