FW-VAV Quick Start Guide

Johnson Controls

Contents

FW-VAV overview

The FW-VAV is a network VAV (variable air volume) input/output controller with Ethernet and Wi-Fi connectivity, as well as a 560 MHz GHz processor, 128 MB RAM, 32 MB flash memory, HTML5 graphics, a suite of applications and kits, and multifunctional adapter widgets.

The controller features five standard applications that you can download and commission with a web browser.

➤ **Important:** Only use the controller as an operating control. Design additional precautions into the control system where failure or malfunction of the controller could lead to personal injury or damage to the controlled equipment or other property. Incorporate and maintain other devices that warn of or protect against controller failure or malfunction, such as supervisory, alarm systems, safety, or limit controls.

Figure 1: FW-VAV controller
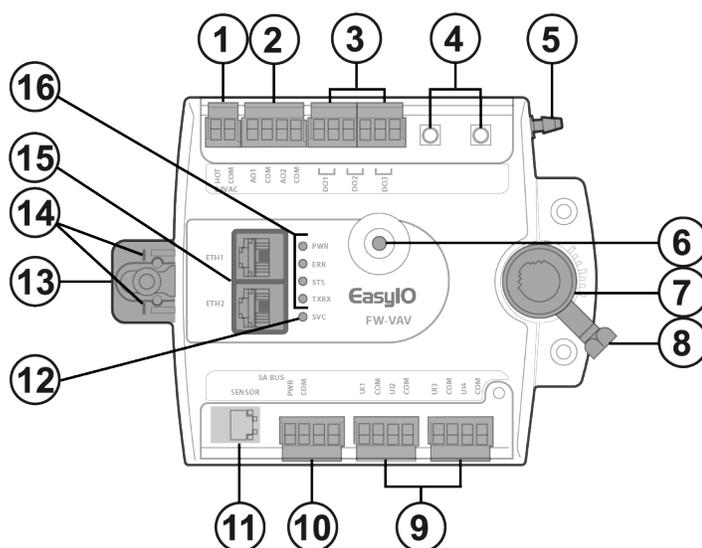
Callout	Description
1	24 VAC, Class 2 supply power
2	Analog output terminals
3	Digital output terminals
4	RP-SMA female antenna jacks
5	Dual port pressure sensor fitting with bidirectional flow
6	Manual override button
7	Controller coupler
8	Coupler bolt
9	Universal inputs terminals
10	Sensor Actuator (SA) bus terminals
11	SA bus modular port: RJ-12 6-pin modular jack
12	SVC button
13	Captive spacer and screw
14	Alignment marks

Callout	Description		
15	Ethernet ports		
16	LED indicators	PWR	Lights to indicate the controller is powered
		ERR	Blinks at various rates to indicate an error type
		STS	Blinks to indicate normal operation
		TXRX	Blinks to indicate data transmission
	For more information on LED indications, see LED states.		

Parts included

- One VAV controller with removable terminal blocks
- One No. 10 self-drilling 25 mm or 1 in. screw
- Two Wi-Fi 2.4 Ghz 2.2 dBi antennas
- Additional MAC address stickers
- Pack sheet

Required tools and parts

- One small slotted screwdriver to secure wires to terminal blocks
- One 8 mm or 5/16 in. wrench or a 10 mm or one 3/8 in. 12-point socket
- Shims or washers to level the controller
- One power screwdriver
- One hole punch
- One 3.5 mm or 9/64 in. drill bit
- One pair of pliers
- The length you require of 3.97 mm of 5/32 in. ID pneumatic tubing
- Barbed fittings for ID pneumatic tubing

FW-VAV dimensions

Figure 2: Controller dimensions, cm (in.)

125 (4.92)

165 (6.50)

73 (2.87)
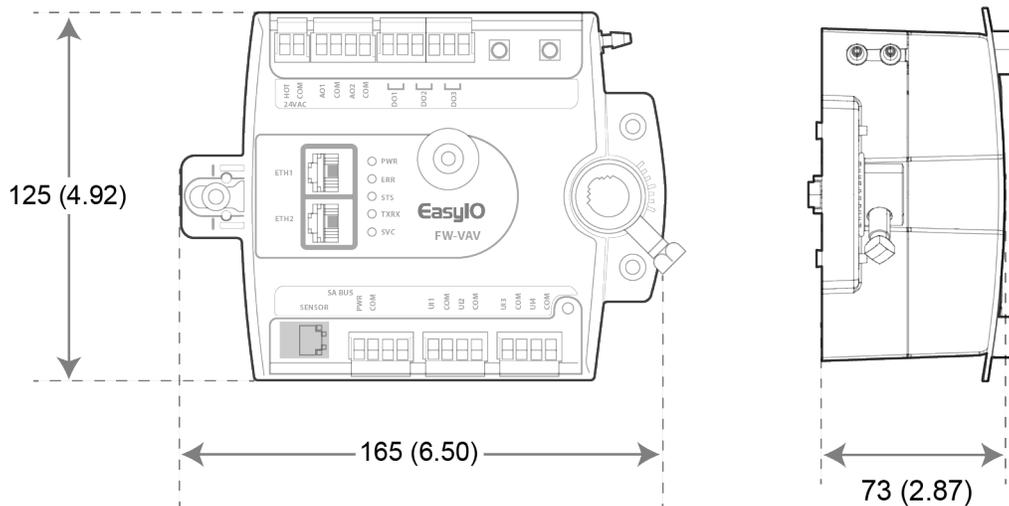
FW-VAV mounting guidelines

Adhere the following guidelines when you mount the FW-VAV:

ⓘ **Note:** When the air supply to the VAV box is below 10°C (50°F), ensure that condensation on the VAV box, particularly on the damper shaft, does not enter the VAV controller.

- Mount the controller in an area where there are no corrosive vapors and where the ambient conditions match the conditions specified in Technical specifications.
- Ensure that the mounting surface can support the controller and any enclosure or electronics.
- Mount the controller on a hard, flat surface. Use shims or washers to mount the controller securely and evenly on an uneven mounting surface.
- For adequate ventilation and for cable and wire access and placement, leave at least 50 mm (2 in). around and in front of the controller.
- If you install this controller to replace another, plug the unused open hole in the duct work from the original controller mount. To plug the hole, use the sheet metal screw from the original installation.

For panel or enclosure mounting, observe the following additional guidelines:

- Do not install the controller in an airtight enclosure.
- Leave enough space around the controller so you can remove the cover.
- To avoid excessive heat radiation, leave enough space between the controller and the power transformer and other devices.

Mounting locations to avoid

Do not mount the controller in the following locations:

- In an area with excessive moisture, corrosive fumes, or explosion vapors
- Where excessive vibration or shock occurs

- In locations with excessive electrical noise, such as large magnetic interference, or variable speed drive modules

Mounting the FW-VAV controller

1. Ensure that the controller base is parallel to the VAV box and perpendicular to the damper shaft. If the shaft bushings make the mounting surface uneven, use a spacer to create an even surface.

   ⓘ **Note:** To ensure sufficient movement in either direction, use the alignment marks to center the captive spacer.

2. Secure the self-drilling No. 10 screw through the captive spacer with a power screwdriver and a 100 mm (4 in.) extension socket. Alternatively, you can use a punch to mark the position of the shoulder washer, and then drill a hole into the VAV box with a 3.5 mm (0.14 in.) drill bit. Insert the mounting screw and tighten it against the spacer.

   ❱ **Important:** To avoid stripping the threads, do not overtighten the screw.

   ❱ **Important:** If you mount the controller to the VAV box, ensure that the screws do not interfere with damper blade movement.

3. Locate the damper position. Use the typical marking on the end of the damper shaft as shown in the following figure.

   Figure 3: Typical damper end shaft markings

4. Note if the direction to close the damper is clockwise (CW) or counterclockwise (CCW). Grasp the damper shaft firmly with pliers, and choose one of the following options:
   - For 90° boxes, manually close the damper.
   - For 45° and 60° boxes, manually open the damper.

5. Press and hold the **Manual Override** button. For more information, see Manual override in Table . Turn the controller coupler until it contacts the mechanical end-stop at one of the following positions:
   - For 90° boxes, turn the controller coupler until it contacts the mechanical end-stop at the full-closed position.
   - For 45° and 60° boxes, turn the controller coupler until it contacts the mechanical end-stop at the full-open position.

6. To set the open end-stop, complete one of the following options:
   - For 90° boxes, if the damper closes CCW, rotate the coupler to the CCW mechanical limit. If the damper closes CW, rotate the coupler to the CW mechanical limit.
   - For 45° and 60° boxes, provide hard stops at both full-closed and full-open damper positions. When you install the controller at the full-open position, the controller provides the open stop for 45° and 60° boxes. The closed damper seal provides the full-closed stop.

   ⓘ **Note:** The integrated actuator has a stroke time of 60 s for 90° of travel. The stroke time is the amount of time in seconds that it takes the actuator to move from the fully closed to the fully opened position or from the fully open to the fully closed position. For 45° and 60° box stroke times, adjust the drive time in the application. Calculate the new drive time so that the actuator precisely controls the damper, which is a time-based control. To calculate the drive time for 45° and 60° boxes, see Calculating the drive time for 45° and 60° boxes.

7. Tighten the square coupler bolt to the shaft with an 8 mm (0.31 in.) wrench or 10 mm (0.38 in.) 12-point socket. Tighten the coupler bolt to 10.5 N m (7.9 lb ft) to 11.5 N m (8.3 lb ft.)

    ⓘ   **Note:** The models have either a round shaft with a diameter of up to 13 mm (0.51 in.), or a 10 mm (0.39 in.) square shaft.

8. Loop the pneumatic tubing supply to include a trap for condensation. Field personnel must supply the pneumatic tubing. Take the length of tubing you require and attach one end to the dual port fitting on the controller, and attach the other end of the tubing to the pressure transducer in the VAV box application.

    ⓘ   **Note:** The controller uses a digital differential pressure (DP) sensor with bidirectional flow operation. You can connect the high-pressure and low-pressure DP tubes to either barbed fitting on the controller. You do not need to make a specific high-side or low-side connection when you attach the tubing to the barbed fittings on the controller.

9. Press the **Manual Override** button, and turn the actuator coupling manually to ensure that the actuator can rotate from full-closed to full-open positions without binding.

10. Rotate the damper to the full-open position.

    ⚠   **CAUTION:** Risk of property damage. Rotate the damper to the full-open position before you start the air handler. If you do not to rotate the damper to the full-open position when the air handler starts, you can damage to the VAV box or ductwork.

Calculating the drive time for 45° and 60° boxes

To calculate the drive time for 45° and 60° boxes, use the following calculation:

drive time = (60 s / 90°) x (The degree you require, such as 45° or 60°)

Installing the antennas

1. Locate the two RP-SMA female jacks
2. To connect the male antenna connectors to the female RP-SMA jacks, screw on the antennas in a clockwise direction.

    ⓘ   **Note:** For a secure connection, when you tighten the antennas to the female RP-SMA jack, hold the metal part of the RP-SMA male connector. A poor connection can reduce reception.

Figure 4: Screwing on the antennas
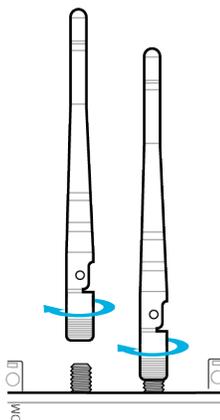
3. Adjust the direction of the antennas to find the best reception.

Input, output, and 24 VAC Class 2 transformer power input wiring diagrams

See the following wiring diagrams for each wiring configuration:

⚠ **WARNING:** There is a risk of electric shock. Before you make electrical connections, disconnect the power supply.

⚠ **CAUTION:** Before you connect the supply power to the controller, complete the wiring and check all wiring connections. Short circuits or incorrectly connected wires can damage the controller and void any warranty.

⚠ **CAUTION:** Do not exceed the controller electrical ratings. If you exceed controller electrical ratings, it can result in permanent damage to the controller and void any warranty.

➤ **Important:** Use copper conductors only. Wire in accordance with local, national, and regional regulations.

⚠ **CAUTION:** Electrostatic discharge can damage controller components. To avoid damaging the controller, use proper electrostatic discharge precautions during installation, setup, and servicing.

Figure 5: 24 VAC Class 2 transformer power inputi

Callout	Description
1	20 AWG copper stranded wire
2	Controller
3	H terminal
4	G terminal

Figure 6: Analog output wiring
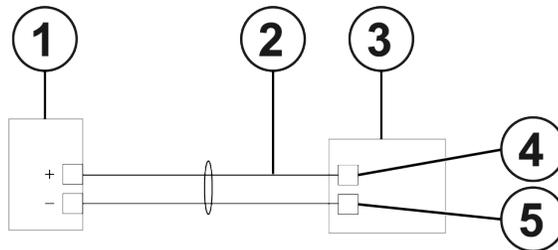
Callout	Description
1	Field device
2	22 AWG copper stranded twisted wire up to 100 m in length.
3	Controller
4	AO terminal
5	COM terminal

Figure 7: Digital output wiring
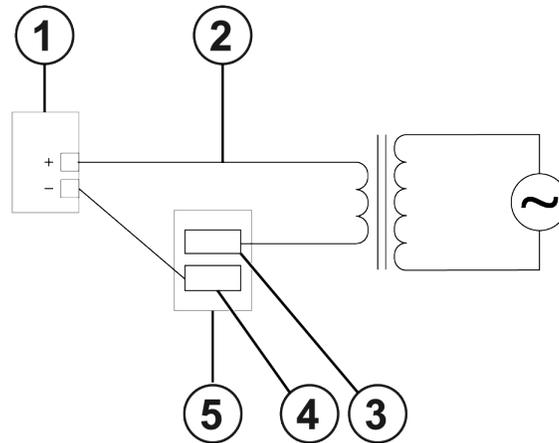
Callout	Description
1	Field device
2	20 AWG copper stranded twisted wire up to 100 m in length
3	DO terminal
4	COM terminal
5	Controller

Figure 8: Universal input voltage mode wiring
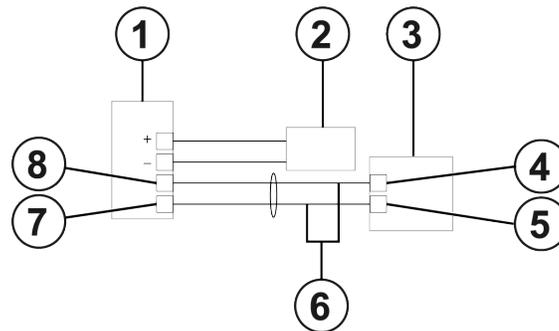
Callout	Description
1	Field device
2	Power supply
3	Controller
4	UI terminal
5	COM terminal
6	22 AWG copper stranded twisted wire up to 100 m in length
7	COM terminal
8	OUT terminal

Figure 9: Universal input resistance mode
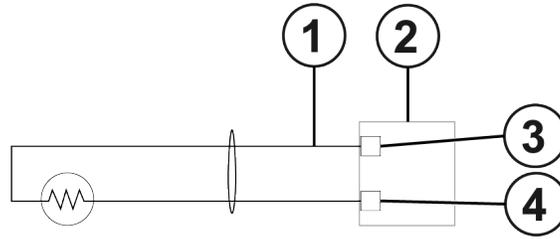
Callout	Description
1	22 AWG copper stranded twisted wire up to 100 m in length
2	Controller
3	UI terminal
4	COM terminal

Figure 10: Universal input digital dry contact input
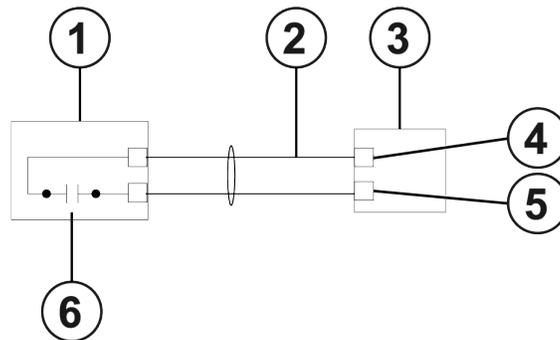
Callout	Description
1	Field device
2	22 AWG copper stranded twisted wire up to 100 m in length
3	Controller
4	UI terminal
5	COM terminal
6	Dry contact
	NO or NC as required

Power supply terminal wiring

Connect the 24 VAC supply power wires from the transformer to the HOT and COM power terminals as shown in the following figure.

ⓘ **Note:** The supply power wire colors may differ on transformers from other manufacturers. Refer to the transformer manufacturer's instructions and the project installation drawings for wiring details.

◢ **Important:** To reduce noise, interference, and ground loop problems, connect a 24 VAC supply power to the controller and to all other network devices so that transformer phasing is uniform across network devices. The controller does not require an earth ground connection. However, when you need to ground the secondary of the 24 VAC transformer, make only one ground connection near the transformer. For more information, see the following figure.

Figure 11: Transformer grounding
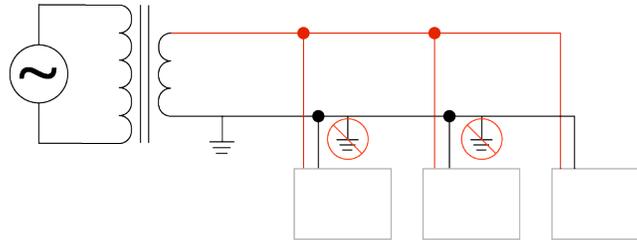
⚠ **CAUTION:** To avoid property damage, before you apply power to the system, check all wiring connections. If you wire this terminal incorrectly, a short circuit can occur across the 24 VAC power supply on the controller. A short circuit can cause a tripped circuit breaker or a blown fuse. If you use a transformer with a built-in fuse, you may need to replace the transformer.

Input and output terminal wiring considerations

- Run all low-voltage wiring and cables separate from high-voltage wiring.
- For all input and output cables, use twisted, insulated, and stranded copper wires.
- Use shielded cables for input and output cables that are exposed to high electromagnetic or radio frequency noise.
- Cable runs over 30 m or 100 ft require an offset in the input and output software setup.

SA bus terminals

Wire the SA bus terminals in a daisy-chain configuration. Use a stranded four-wire twisted and shielded cable as shown in the following figure. The four-wire cable consists of two twisted pairs. The first twisted pair is the positive and negative wires and the second twisted pair is COM and SA PWR wires.

You can use the SA Bus positive and negative wires as a normal RS-485 port.

Figure 12: SA terminal wiring
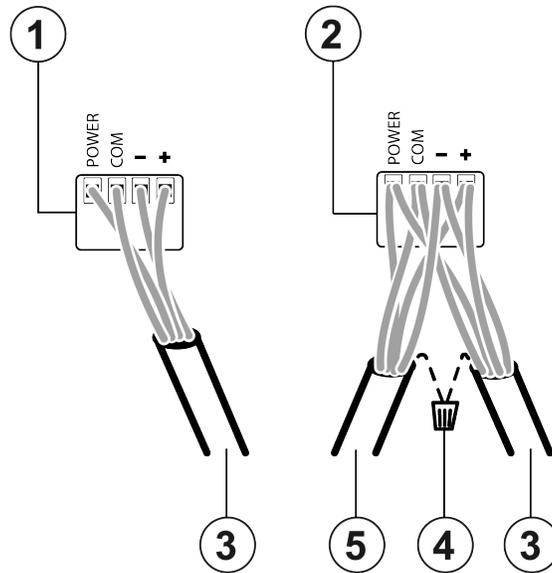
Callout	Description
1	Terminal on the first device
2	Terminal on the daisy-chained device
3	Connection to another device on the SA bus
4	Cable shield connection. You do not need to ground the cable shield.
5	Connection from another device on the SA bus

SA bus port

The SA bus port on the face of the controller is an RJ-12, six-position modular jack that provides a connection for Johnson Controls network sensors with RJ-12 plugs. The preferred method to connect the devices to the SA bus is with the SA bus terminals, but the application does not prevent you from using the SA bus port connection. Make sure that you connect the correct device to the SA bus port.

ⓘ **Note:** FW-VAV is not intended to support third-party devices on an SA bus.

ⓘ **Note:** Do not use the modular SA bus port and the SA bus spade lug connection at the same time. Use only one connection at a time.

Figure 13: Pin number assignments for the SA bus port
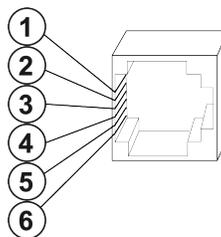
Callout	Description
1	Power
	15 VDC max 240 mA
2	Bus and power common
3	Power
	15 VDC max 240 mA
4	Bus and power common
5	Sensor bus negative terminal
6	Sensor bus positive terminal

Controller interfacing

To interface with a controller and its inputs and outputs with CPT and the controller's web server, establish a connection from your device. You can connect to your controller with a device with the following options:

ⓘ **Note:** Use the following procedures to set up a controller on a primary network. For more information on a secondary network setup, refer to the product's *User Reference Guide*.

- To connect to your controller with a computer or laptop by using an Ethernet LAN cable, see Establishing a connection to a controller with an Ethernet LAN cable.
- To connect to your controller with a mobile device, computer, or laptop with Wi-Fi, see Establishing a connection to a controller with Wi-Fi.

Interface with your controller with the following user interfaces:

- Access the controller dashboard and make network, DateTime, and service configuration changes on the controller's web server. For more information, see Interfacing with a controller's web server.
- Program controller object logic with CPT. For more information, see Interfacing with controller objects using CPT.

Establishing a connection to a controller with an Ethernet LAN cable

1. Connect your computer to the controller with an Ethernet LAN cable.
2. Set up your network adapter in the same range as the controller. To change your IP address, subnet mask and gateway, open the command prompt and complete one of the following options, depending on your operating system:

   ⓘ **Note:** Use the same subnet mask and gateway as the controller. For the IP address, enter the same IP address as the controller, but change the last octet to a unique number. Use a high number that is less than 255 to avoid using an IP address that is already in use. For more information on your controller's IP address, subnet mask, and gateway, see Primary network default IP address, subnet mask, and gateway.

   - For Windows operating systems, set your new IP address, subnet mask, and gateway with one of the following options:
     - To use the GUI, complete the following steps:
       i. Go to **Control Panel**/**Network and Internet**/**Network and Sharing Center**/**Change adapter settings**/.

ii.	Right-click your Ethernet connection, then click **Properties**.

iii.	On the **Networking** tab, select the **Internet Protocol Version 4 (TCP/IPv4)** check box, then click **Properties**.

iv.	On the **General** tab, click **Use the following IP address**. In the **IP address**, **Subnet mask**, **Default gateway** fields, set the IP address, subnet mask, default gateway you want.

- To use the command prompt, complete the following steps:

i.	From the command prompt, enter the following command with the IP address, subnet mask, default gateway you want:

```
netsh interface ipv4 set address name="Ethernet" static <IP
address> <subnet mask> <gateway>
```

ii.	To confirm the connection, from the command prompt, enter the `ping` command, followed by the controller's IP address.

- For Mac operating systems, set your new IP address, subnet mask, and gateway with one of the following options.

- To use the GUI, complete the following steps:

i.	Click the Apple menu icon, then go to: **System Preferences**/**Network**/.

ii.	Click the network connection you want, then click **Advanced**.

iii.	On the **TCP/IP** tab, from the **Configure IPv4** list, select **Manually**.

iv.	In the **IPv4 address**, **Subnet Mask**, and **Router** fields, set the IP address, subnet mask, default gateway, then click **OK**.

- To use the terminal, complete the following steps:

i.	From the terminal, enter the following command with the IP address, subnet mask, default gateway you want:

```
networksetup –setmanual "Ethernet" <new IP address> <subnet
mask> <gateway>
```

ii.	To confirm the connection, in the terminal, enter the `ping` command, followed the controller's IP address.

- For Linux operating systems, set your new IP address, subnet mask, and gateway with one of the following options.

- To use the GUI, complete the following steps:

i.	From the toolbar, click **System**. From **Preferences**, Click **Network Connections**.

ii.	Find the network connection you want, then click the configure icon.

iii.	On the **IPv4** tab, click **Manual**.

iv.	In the **IPv4 address**, **Netmask**, and **Gateway** fields, set the IP address, subnet mask, default gateway you want, then click **Apply**.

- To use the terminal, complete the following steps:

i.	From the terminal, enter the following command with the IP address, subnet mask, default gateway you want:

```
networksetup –setmanual "Ethernet" <new IP address> <subnet
mask> <gateway>
```

ii.	To confirm the connection, in the terminal, enter the `ping` command, followed the controller's IP address.

Establishing a connection to a controller with Wi-Fi

1. On your computer, from the desktop toolbar, click your Wi-Fi network icon.
2. Find the controller's SSID, then connect to the controller.

    ⓘ   **Note:** Your controller's default SSID is a combination of the controller's series letters and the last four characters of the controller's MAC address, for example, FW-012A. You can find the MAC address on the label on the back of the controller.

3. Enter the default password. For more information, contact your supplier.
4. To ping the controller, at the command line, enter `ping`, followed by the controller's IP address.

    ⓘ   **Note:** For more information on your controller's default IP address, see Primary network default IP address, subnet mask, and gateway.

Primary network default IP address, subnet mask, and gateway

Table 1: Default IP address, subnet mask, and gateway for a primary network setup

Item	Address
IP address	192.168.10.30
Subnet mask	255.255.255.0
Gateway	192.168.10.1

Interfacing with a controller's web server

1. Launch a HTML5 web browser, such as Google Chrome, Mozilla Firefox, Microsoft Edge, or Safari.
2. In the web browser's address bar, enter your controller's IP address, then press the Enter key or Return key.

What to do next:
To configure your controller's network settings, refer to *EasyIO FW Network Configuration Guide EasyIO FS Network Configuration Guide*.

Interfacing with controller objects using CPT

Use CPT to program EasyIO controller logic with the Sedona framework.

1. To download the CPT application, contact support for the latest release.
2. Unzip the folder and double-click the `cpt.exe` file.

   ⓘ **Note:** If you already have the application and want to update it to a new release, to avoid personal settings data loss, do not click and launch the `cpt.exe` file. Unzip the package and drop all the files into the existing CPT folder to merge and overwrite outdated files.

3. To connect to a controller, from **File**, then click **Open App**.
4. In the **Project Management** window, on the **Recent** tab, click **New**.
5. In the **App Desc** field, enter a name for the controller.
6. In the **Host** field, enter the controller's IP address.

   ⓘ **Note:** The default IP address is 192.168.10.30

   ⓘ **Note:** The default IP address is 192.168.10.12

   ⓘ **Note:** For more information on your controller's IP address, see Table .

7. From the **Data Folder** list, select the folder for your controller type.

   ⓘ **Note:** For FW Series controllers, select **SedonaFW**

   ⓘ **Note:** For FS Series controllers, select **SedonaFG**

   ⓘ **Note:** For more information on your controller's data folder, see Table

8. Click **Save**.
9. Click **Open**
10. In the **Authentication** dialog, enter your password, in the **Password** field.

ⓘ **Note:** By default, there is no password. To increase security, when you log on, complete the steps in *Creating a new CPT admin password for a controller* in *EasyIO Hardening Guide*.

What to do next:
For more information on CPT, Refer to *EasyIO CPT User Guide*.

LED states

The following LED states refer to the LED indicators on the controller. For more information, see LED indicators in Table .

Table 2: FW-VAV LED states

LED label	LED color	Normal state	State	Description
PWR	Green	On steady	Off steady	No power
			On steady	Power is supplied by primary voltage
ERR	Red	Off steady	Constant rapid blinking	An error state, such as a faulty FM-06 module
			On steady	Firmware upgrade in process. Ensure that there is no power loss during this period.
			Rapid blinking with a long pause	An error state in the app, such as web server restarting
			Off steady	No errors
STS	Green	Blink 1 Hz	Blink 1 Hz	Normal operation
			Off steady	Faulty controller
TXRX	Yellow	Blink 1 Hz to 5 Hz	Blink	Normal data communication
			Off steady	No data transmission

Troubleshooting

Table 3: FWs troubleshooting

Problem	Cause	Solution

The controller does not turn on due to one of the following problems:
• The transformer trips. Power is at the transformer primary and there is no voltage at the secondary.
• The breaker or fuse trips. Power is at transformer primary. There is 24 V at secondary and 0 V at breaker or fuse.
	The transformer shorted.
	The 24 VAC powered sensor is not wired with the same polarity as the controller.
	The SA Bus device is not wired with the same polarity as the controller.
		1. Ensure that the polarity of ~24 V COM, +15 V COM, and SA BUS COM on the controller, auxiliary devices, and input and output devices is the same.
		2. Verify that the short circuit has been resolved with an ohm-meter.
		3. Reset the breaker or fuse, or replace the transformer.
		   ⓘ **Note:** When you replace the transformer, replace it with a model that uses a resettable circuit breaker. A circuit breaker makes it easier to solve wiring problems.
		4. To verify the connection, complete the following steps:
		   a. Disconnect the secondary of the 24 VAC transformer.
		   b. Use an ohm-meter to measure between ~24 V H and G at the controller. Ensure that no short circuit occurs.
		      ⓘ **Note:** If your installation requires that you earth ground the transformer secondary, verify that the earth ground connection is valid and not shared between multiple pieces of equipment.

Analog output mode is invalid. 0 V to 10 V output is set to 100%, but output terminals are less than 10 V.	Load impedance is lower than 5K ohms.	1. Ensure that the voltage control device load impedance is higher than 5,000 ohms. For more information, refer to voltage device manufacturer specification. 2. Disconnect the connected device and verify that the value you require is present.

Table 3: FWs troubleshooting

Problem	Cause	Solution
Analog mode for a configurable output is invalid. For example, 0 V to 10 V output has an undesirable offset of up to 1 V. The Common Reference is incorrect.	The COM terminal is not connected.	1. Connect the COM terminal of the configurable output to the common of the connected end device. 2. Measure the output and verify that it matches the command. 3. Disconnect the connected device and verify the commanded value is present.

Technical specifications

Table 4: FW-VAV UL input, output, and communication ratings

Description	Specification		Terminal
Power supply	Nominal	24 VAC	H and G
	Minimum	20 VAC	
	Maximum	30 VAC	
	50 Hz or 60 Hz		
	Power supply	Class 2	
Universal inputs	Voltage	0 VDC to 10 VDC, Class 2	UI1 and COM to UI4 and COM
	Resistance	400 ohm to 200,000 ohm	
Digital outputs (SPST N.O. dry contact)	24 VAC, 0.5 A pilot duty, Class 2		DO1, DO2, DO3
Analog output	Voltage	0 VDC to 10 VDC Min 2,000 Ohm Impedance	AO1and COM to AO2 and COM
EIA/RS-485	Class 2		SA Bus +, -
Ethernet Ports	Class 2		ETH 1
			ETH 2
Differential pressure sensor specifications			
Air flow sensor	0 Pa to 500 Pa per 0 in. to 2 in. of water		

Table 5: FW-VAV controller specifications

Controller processor and memory specifications	
Main processor	Qualcomm 560Mhz
Processor	ARM Cortex 48 Mhz
Flash memory	32 MB
RAM	128 MB
Product temperature and humidity specifications	
Operating temperature	0°C (32°F) to 50 °C (122°F)
Storage temperature	-40°C (-40°F) to 70 °C (158°F)
Operating humidity	10% to 90% relative humidity, non-condensing
Physical specifications	
Dimension	230 mm (9.1 in.) x 104 mm (4.1 in.) x 44 cm (1.7 in.)
Material	UL Approved
Weight	500 g
Wireless ratings	
Standard	IEEE 802.11
Band	b/g/n
Frequency range	2412 MHz to 2462 MHz
Antenna	2.2 dBi Dipole
Transmission power	18.98 dBm EIRP

Compliance

Table 6: FW-VAV Compliance

North America	UL 60730 Energy Management Equipment FCC Class B , Part 15 , Subpart C 15.247
FCC	This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device. ⓘ **Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential instal-lation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interfer-ence will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: — Reorient or relocate the receiving antenna. — Increase the separation between the equipment and receiver. — Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. — Consult the dealer or an experienced radio/TV technician for help. Limited by local law regulations, version for North America does not have region selection option. This radio transmitter IC: 279A-FWVAV has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device. Gain of antenna: 2.2 dBi max Type of antenna: 50 Ohm Dipole To satisfy FCC & IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.

Table 6: FW-VAV Compliance

	L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) L'appareil ne doit pas produire de brouillage; (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Le présent émetteur radio IC: 279A-FWVAV a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur. Gain d'antenne: 2.2 dBi maximal Type d'antenne: 50 Ohm Dipole . Les antennes installées doivent être situées de facon à ce que la population ne puisse y être exposée à une distance de moin de 20 cm. Installer les antennes de facon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l'antenne.
CE	Compliant
RED directive	The Equipment named above is confirmed to comply with the requirements set out in the European Council Directive on the Approximation of the Laws of the Member States relating to 2014/53/EU (RED). The equipment passed the following test which was performed according to the following European standards: EN 300 328 V2.1.1 EN 301 489-1 V2.2.0 EN 301 489-17 V3.2.0 EN 62311: 2008
UKCA	Directive Electromagnetic Compatibility Regulations 2016: BS EN 55032:2015+A11:2020 BS EN IEC 61000-3-2:2019 BS EN 61000-3-3:2013+A1:2019 BS EN 55035:2017+A11:2020
Taiwan	取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Patents

Patents: https://jcipat.com

Single point of contact

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