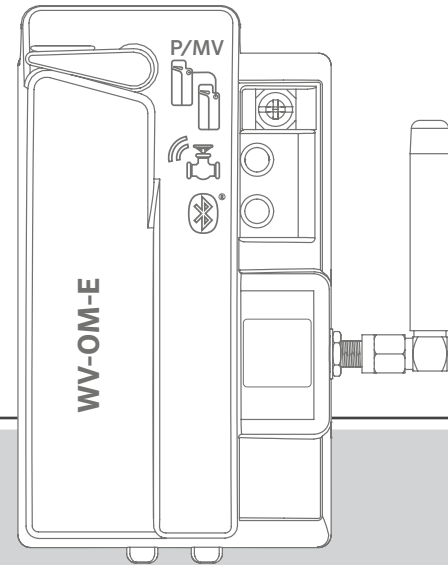


Wireless Valve Output Module

OWNER'S MANUAL



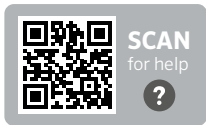
WVOM-E

Wireless Valve Output Module for
Hunter ICC2 and HCC Controllers

Hunter[®]

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Need more helpful information on your product? Find tips on installation, controller programming, and more.

hunter.help/WVOM-E

Introduction

The Hunter Wireless Valve Output Module (WVOM-E) was designed for installation in any compatible controller output module slot.

The WVOM-E installs like any other Hunter output module. It does not technically matter which output slot the WVOM-E is installed in.

However, the WVOM-E can coexist with conventional Hunter ICM and/or EZDM Output Modules. The best practice is to install any ICMs in the lowest-numbered slots, so the engraved station numbering in the controller chassis aligns correctly with the conventional output terminals.

Add the WVOM-E in the next slot available to simplify future service.

The WVOM-E is designed to operate with Hunter Wireless Valve Link (WVL) devices only. It is not compatible with any other manufacturer's devices.

The WVL requires Hunter DC-Latching Solenoids (P/N 458200), which can be retrofitted to any existing Hunter valve.

The Hunter WVL System is a wireless output option for Hunter ICC2 and HCC Controllers. The WVL requires installation of a WVOM-E in a controller output module slot.

Key Benefits

Simple, Wire-Free Connections

This convenient and innovative wireless valve technology simplifies installation to save time, money, and labour. It includes these benefits:

- Works with Hunter ICC2 and HCC Controllers and is compatible with Centralus™ and Hydrawise® Software
- Adds up to 54 valves (+P/MV) up to 600 m line-of-sight or more with a Repeater
- Licence-free LoRa® Wireless Radio Technology enables wireless communication directly to the valve box — no copper field wiring required
- Combines with conventional ICM or EZDS Output Modules for ultimate flexibility
- Simplifies installation by eliminating the need to run costly field wires or cut into hardscape

*Wireless range is subject to terrain, foliage, buildings, and other site factors. Consult product documentation before installing.

Installation

You will need:

- Free Bluetooth® enabled Hunter WVL App, which is required to perform installation or service. Download it from the Apple or Google Play store at right.
- 9 V DC batteries (2 per WVL)
- Irrigation-grade, waterproof connectors for DC-Latching Solenoid connections
- 38 mm hole saw, included with WVOM-E for mounting WVL in valve box lid



Note: Do not use the hole saw on the controller enclosure! The hole saw is for installing the individual WVL devices in valve boxes.



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Installation

1. Engage the tabs in the output module slot and tip into place until the connector is fully seated.
2. Move the locking lever to the horizontal position to lock the module into place.
3. Press and release the Reset button on the back of the facepack. This enables the controller to recognise the WVOM-E and its 54-station configuration.
4. When the controller is powered on, the LED lights will emit a constant green light. This lets you know that the module has power and is ready to communicate.
5. If the WVOM-E is being installed in a metal enclosure, it is necessary to extend the antenna outside the metal enclosure. Use the Hunter ANTEXTKIT to extend up to 3 m outside the enclosure.

WVOM-E LED Light Indications

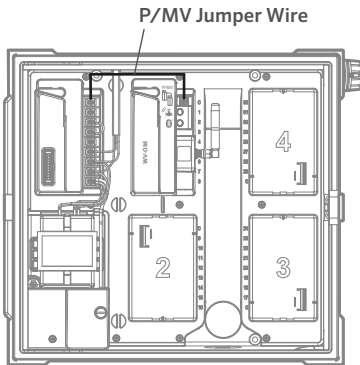
After installation, a brief display of lights will appear as the module powers up. Once powered up, the lights will communicate valuable system status information.

Light Activity	Meaning
Top light, solid green	WVOM-E has power and is ready
Top light, flashing green	Fast blink: WVOM-E is communicating Slow blink: WVOM-E is watering
Top light, solid amber	WVOM-E has detected an alarm condition (internal beeper will also sound)
Top light, flashing amber	Fast blink: WVOM-E is rebooting Slow blink: WVOM-E alarm is active
Bottom light, solid blue	Bluetooth app is connected to WVOM-E (LED will be dark if not connected)

P/MV Connection

It is possible to use the WVOM-E with a normally wired Pump/Master Valve (P/MV) output. However, it is also possible to use a WVL for this purpose if it has a DC-Latching Solenoid (P/N 458200).

If wireless control of a P/MV output will be used, connect a jumper wire from the P/MV terminal on the WVOM-E to the P/MV output on the controller power module.



WVL Station Programming

The WVOM-E has no built-in controls, only LEDs to show status. All programming and diagnostics are done with the free Hunter WVL App, available for iOS® or Android® from their respective app stores.

Download and install the app.



Language: The Hunter WVL App will automatically use the phone settings for the user's selected language. If the phone is set to a language translation that is not available, the app will appear in English.

Open the app on a smartphone, and it will immediately begin scanning for WVOM-Es within range, roughly 15 m line-of-sight.

In a few moments, a list of available WVOM-Es within Bluetooth range will appear, identified by serial number.

Select the WVOM-E you are programming (if there is more than one listed) and click Connect. The blue LED on the selected WVOM-E will light up when it is connected to the phone.

The app will then display a list of WVL station links that are already connected, if applicable. If there are no links available, it will show a blank screen.

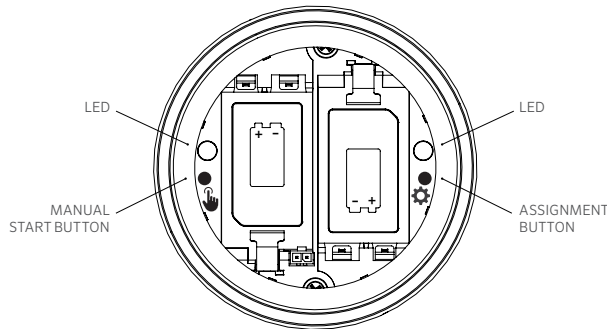
Click the WVL button at the bottom of the screen to add or edit a WVL device. A + button will appear in the top right of the screen.

Bring the WVL close to the controller to ensure reliable communications. Remove the WVL battery cover.

! Note: Assign one WVL at a time to avoid confusion or accidental multiple addresses.

Install one 9 V DC battery in the left compartment of the WVL.

“Left” means the manual start finger icon is on the left side with the solenoid wires extending to the right. The right button is marked with a gear icon. Lights are on top, and the button is below.



To enter Assignment Mode, press and hold the right button inside the WVL battery compartment for 2 seconds until the right (gear) LED lights up yellow.

The WVL will remain in this mode for up to 5 minutes, or until the station assignment is completed.

In the app, go to the WVL screen. Existing WVLs will be shown (you can edit their station numbers by clicking the pencil icon).

To add a new WVL, click the + button on the WVL screen. Press the Scan button to look for the new WVL in Assignment Mode.

If a WVL in Assignment Mode is found, it will be displayed with the current station information. New WVLs will only show “Null” for each station because they have not been assigned yet.

Use the app screen to select controller station numbers (or P/MV) for each output on the WVL (single-station WVLs will only have one choice while multi-station controllers will allow each output to be assigned individually).

! Note: Unused stations can be set or left to “Null” so they are not assigned and reserved for future use.

If the WVL uses the optional Solar Panel Kit (SP-WVL), click the slider in the app for Solar Powered to ensure that the battery status is displayed correctly.

When each station in the WVL is assigned as desired, click the Save button at the bottom of the screen. The WVOM-E will send the station programming to that device via the LoRa Radio. The WVOM-E's LED light will blink rapidly during this process.

If the save was successful, the assignment light in the WVL being addressed will blink amber several times. Within a few seconds, you'll also see a message in the app advising you if the save was successful or not.

Use a permanent marker to write the successful station number assignments on each WVL as you program them to ensure you remember the station numbers. There is space on the battery cover to write each station number, and you can also write it on the side (near where the wires come out) for longevity.

Then proceed with the physical installation of the programmed WVLs in the field locations (valve boxes) as detailed in the WVL Installation Guide.

Basic Troubleshooting

(Beeping and Error Messages)

All LoRa Radio communications between the WVOM-E and the WVLs (or Repeater) are two-way. Whenever the WVOM-E sends a message to the WVLs or the Repeater, it expects a response. The response confirms the command and updates battery and signal information.

The two-way communications occur every time the controller attempts to turn on a WVL station.

If the WVOM-E does not receive a response after a retry attempt, the module will announce the error both in the controller display and with two internal beeps every 2 minutes. The beeps can be heard roughly 15 m away from the controller in fairly quiet surroundings.

- The display will show the station number (or "P" for Pump) along with "Err" to indicate which station failed to respond.
- The beep will continue until either:
 - the WVOM-E is able to communicate successfully with the unresponsive WVL again, or
 - you press the Reset button on the back of the controller facepack.

If the controller is connected to the Centralus web control application, the software can also send a text message to a mobile device to announce the alarm. This will be worded as an "Overload" message and cannot report the actual station number. It is only to let you know there is an alarm condition at the location. You must visit the site to perform further diagnostics via the Hunter WVL App and fix the problem.

If an HCC Controller is connected to Hydrawise Software, some additional reporting is possible via the controller's touch screen or the Hydrawise App:

- A station has experienced a communications error
- The batteries are in a low-charged state
- The batteries are critically low and must be replaced immediately

These messages will also appear in the Hydrowise App, webpage, and events log.

Use the Hunter WVL App to connect to the WVOM-E, and go to the WVL screen. Press Details. Any WVL with a red status icon has failed to respond. Press the Refresh button under any WVL on the Details page to see if it will respond, and update the battery and signal information.

A WVL that cannot communicate will not be able to water any of its valve stations (other WVLs will not be affected and will continue to water normally).

The most common causes of communication failures are:

Cause	Solution
Low battery	Replace batteries (or inspect solar panel, if using solar power)
Environmental changes (e.g., obstructing vehicle, overgrown foliage)	Locate and remove obstacle if possible, elevate WVOM-E antenna, or add Repeater
Radio interference from other devices	Try a different channel (use the app) to eliminate interference
WVL internal failure (e.g., lightning)	Check LEDs in WVL battery compartment for functionality or, if necessary, replace WVL

Foliage can have an effect on the wireless signal. It is possible that landscape plants leaf out or grow over time and disrupt communications with a distant device that used to respond.

New plantings, structures, or vehicles may also have such an effect.

Other Application Features and Diagnostics

All WVOM-E/WVL information comes through the Hunter WVL App. It is important to remember that the app is connected directly from the smartphone to the WVOM-E, but all field communications from the WVOM-E to the WVLs are conducted via LoRa Radio.

Bluetooth offers a relatively short 15 m range, so you must be close to the controller to use it.

LoRa offers a relatively long 650 m range, which allows information to be reported to the WVOM-E from the WVLs in the field. You can get information from any connected WVL if you are within Bluetooth range of the controller.

Dashboard

Connect to a controller WVOM-E from the app, and the Dashboard will appear on the first screen. This shows the current status of all stations, age of the information, and whether the station is currently active.

A “Fail” message for any station indicates a problem. See the Details screen for more information.

To learn more about each station, click Details in the upper right corner of the app.

Details Screen

The Details screen will summarise the most recent information for each WVL in the system and the Repeater if one is present.

WVLs are reported together with their output station assignments. Each WVL will show its serial number and current firmware version number.

Status

The WVL is either functioning correctly (green) or has a problem (red). See station details for more information.

Battery Indicator

This shows the approximate status of the internal batteries, which are critical to proper WVL operation. A low-battery indicator will trigger a warning to replace the batteries at the earliest opportunity, before operations become unreliable.

WVLs using solar power will have a special battery icon with a partial sun indicator. Solar-powered WVLs do not show a battery percentage. The battery icon has internal bars to show the charged state, and if voltage falls to an unacceptable level, the empty battery icon will display.

Signal

This shows the quality of the radio connection between the WVOM-E and the WVL. A poor signal can also mean unreliable operations. Antenna placement, low battery, or other radio noise in the area may cause a poor signal.

Signal quality is displayed as a percentage. It is based on the Signal-to-Noise Ratio (SNR) for each WVL device. Whenever the WVOM-E communicates with a WVL in the field, the percentage is updated.

The maximum value is 100%. Devices that completely fail to respond will display a value of 0%.

A special Repeater icon will display for any WVL that is using a Repeater to communicate.

A very low, consistent SNR can mean that the signal should be improved for reliable operation.

- Elevate the WVOM-E antenna (and WVL antenna, if practical) with a Hunter ANTEXTKIT up to 3 m.
- Add a Hunter Repeater (RPT in North America, RPT-E in international markets using the 433 MHz frequencies).
- Make sure WVL batteries are current.

Last Update

Whenever the WVOM-E communicates successfully with a WVL, the date and time of the most recent communication will display. This update will occur at least once every 24 hours. The time shows how long since the information was retrieved.

You can press the Manual Refresh button under any WVL on the screen to update any WVL or Repeater information immediately. This will update both the signal and battery life reports.

Settings

The Settings button at the bottom of the app screen will show the current app information. It will also display several adjustable settings in the WVOM-E itself.

WVOM-E Info

Click the right arrow next to WVOM-E Info for more information, plus Channel and Site ID settings and Repeater setup.

Channel ID

Only use this setting if you have determined that radio interference on the LoRa channel is causing a problem on your site (rare, but possible). There are up to 10 different available channels, and this setting will change the entire operating system to the new channel.

If you select a different channel and then press the Submit button, it will change the WVOM-E to a different channel. The WVOM-E will then automatically attempt to change all known WVLs and the Repeater (if applicable) to the new channel.

A progress indicator will show when the new channel assignment is finished. If the app connection is disconnected from the WVOM-E during the assignment, please reconnect and refresh to verify current status of the reassignment process.

Site ID

Use this setting if two different LoRa systems appear to be interfering with one another on the same channel. Each WVOM-E has a Site ID (from 1 to 255) that is communicated to WVLs when they are addressed.

Generally, changing the Channel ID is an easier means of separating systems that appear to be accidentally cross-communicating. Changing the Site ID is only necessary when multiple different sites are on the same channel and suspected of interfering with one another.

Repeater

This function is necessary if you add a Repeater to a system to improve radio coverage. If you are adding a Repeater, you will be prompted to enter its serial number. The serial number is engraved or printed on the bottom of the Repeater antenna.

When the serial number is entered and saved, each WVL will choose to use it or not, depending on signal strength (either directly from the WVOM-E or the Repeater). The Details screen will show which WVLs have chosen to use the Repeater. This decision cannot be set by users; it is done automatically to preserve battery life in the field.

Repeater batteries are completely solar-powered. If the battery percentage is low, the solar panel may be in a shaded location or covered with dust or debris. Clean the solar panel periodically, and make sure it is correctly placed to get maximum sunlight during the day.

Passcode

You can add a passcode (PIN) to the WVOM-E to prevent unauthorised access by other Bluetooth smartphone users. If you create a passcode, your smartphone will remember it, so you will not have to enter it every time you want to connect to a WVOM-E. Any other user with a different phone will need the passcode to access the device.

It is important to remember your passcode or store it in a safe place. If you forget or lose the passcode, other users may no longer be able to access the WVOM-E or WVL data until it is bypassed. Do not use a PIN that you use for other apps and functions.

If you forget your PIN:

- Open the Hunter WVL App on your smartphone.
- Turn the controller power off, then back on.
- Reconnect the app to the WVOM-E within 10 seconds, and you will not need the PIN code.
- The WVOM-E will send the app a default code and allow access.
- Go to Passcode in the app to enter a new passcode. If you don't want a PIN, go back to the passcode setting within 10 seconds and turn it off.

Recover Database (Replacing a WVOM-E)

The Recover Database feature is used when a WVOM-E must be replaced for service reasons or is exchanged with another device.

The new or replacement WVOM-E will have a different Site ID and serial number. The new WVOM-E must be relinked to all the WVLs in the field to operate.

Recover Database permits automatic restoration of all WVLs within range of the WVOM-E internal database so that they do not have to be manually readdressed individually.

Install the new WVOM-E, connect with the Hunter WVL App, and choose the Recover Database feature.

The app will prompt you to enter the serial number of a known device (either a WVL or a Repeater) within the system. You must read and record a single serial number that was present in the system before the change. The serial number is printed or engraved on each WVL (and the Repeater), so you will need to find a single valid number from the older installation.

The WVOM-E will use the valid serial number to search for the corresponding device and rebuild its station (and Repeater) database.

The WVOM-E will then attempt to reach all operational WVLs or a Repeater within range. This process can take up to 30 minutes. During the recovery period, the WVOM-E may not be able to irrigate reliably. We recommend doing this outside of normal automatic irrigation times.

When the process is complete, a notification will appear. If all WVLs were found, the WVOM-E will be ready to irrigate again without further field addressing.

Factory Reset (WVOM-E)

The Factory Reset option will completely erase all WVOM-E information, including the WVL database, Channel and Site ID assignments, and Repeater configuration. The whole system will need to be set up again to restore operations.

App Info

Click the right arrow next to App Info to see the current app status. App Info provides the current version number of the app and links to Hunter Support and other informational sites.

Firmware Updates

Both the WVOM-E and the WVLs can be updated in the field over the air (OTA) if new firmware becomes available.

Firmware updates are large downloads and can take up to 2 hours. Do not start an update if you need to irrigate or perform other diagnostic functions within this time.

When new firmware is released to the app sites, you will receive a message when you open the app that announces a new version. You may skip the update or choose to update immediately. WVLs that have older versions of firmware, for which an update is available, will show an orange icon next to their version numbers on the Details screen as a reminder.

Firmware updates are important, offering new features or significant fixes. However, be aware that they will interrupt or prevent scheduled irrigation until they are complete.

Updates can also deplete battery life, and the update will not complete if the WVL batteries are too low to finish the process.

Certificate of Conformity to European Directives

Hereby, Hunter Industries declares that the radio equipment type models WVOM-E is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://subsite.hunterindustries.com/compliance/>.



LoRa

MAXIMUM OUTPUT POWER	
Frequency Band (MHz)	Maximum Power (dBm)
433.05 - 434.79	0



MAXIMUM OUTPUT POWER	
Frequency Band (GHz)	Maximum Power (dBm)
2.402 - 2.480	11

Helping our customers succeed is what drives us. While our passion for innovation and engineering is built into everything we do, it is our commitment to exceptional support that we hope will keep you in the Hunter family of customers for years to come.



**Denise Mullikin, President,
Landscape Irrigation and Outdoor Lighting**