



**Le Maitre® Ltd.**

**MVS-Smart**

**Operating Manual**

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# Introduction

The MVS-Smart builds on the solid foundation of the original and highly popular MVS Hazer. It retains the same form factor and all the unique haze output levels and features of the original MVS, including the auto-cleaning cycle on startup, and the notable dual fan setup with sweep capability.

It still utilizes the original and patented technique of producing haze via an easily replaceable 'conversion' tube.

The MVS itself has been designed with user operation and installation in mind and as such can be used in multiple positions. The base support plate can be adjusted to physically support the machine at multiple angles, whilst the separate bottle carrier can be used either attached or separated from the machine.

The MVS-Smart now boasts the following upgraded features:

- Redesigned modern internal electronics
- An easy-to-read display with re-engineered menu system, including automatic saving of settings on the fly.
- Powerful single microprocessor
- Built in auto-DMX detection
- Blocked hazer tube detection
- DMX analyser (able to report the break time, MAB time, channel count, and refresh rate of the incoming DMX signal)
- Optional fluid level sensor
- Wifi/Ethernet connectivity

Unlike most other haze machines, the MVS-Smart also features Wi-Fi and Ethernet connectivity.

LeMaitre machines are designed for years of use. So it cannot be denied that merely having Wi-Fi open more doors than it closes, and as the years roll by, rest assured the MVS-Smart can be upgraded with the latest firmware updates and advances.

Currently it also allows the user to check, set and change the configuration of the unit via a mobile device, such as a laptop, phone or tablet. Also importantly, it is possible to diagnose and debug any errors with the device wirelessly, no apps necessary. As a manufacturer, if granted permission, it allows us to remotely check the setup your machine, diagnose any errors, and update the machine to the latest firmware version to unlock any new features we have added over time. All this from anywhere in the world with an internet connection.

Le Maitre believes that this machine is one of the most effective and versatile haze machines currently available anywhere in the world, and is backed up by our usual high level of technical and sales communication networking. All details of the MVS-Smart are available on our web site at [www.lemaitreltd.com](http://www.lemaitreltd.com)

**NOTE: Wi-Fi networks have a coverage range that is highly dependent the location they're used in, any interference with other wireless signals, and the environment.**

## Safety and Cautions

All electro-mechanical machines have the ability to cause injury, either mechanically or electrically. The user should be fully aware of the correct operational procedures involved in the use of this machine, and should feel comfortable about being in control of it.

All users should make themselves aware of any national or local restrictions to the use of these types of machines in applications involving public venues or areas.

Users should be aware of all regulations and advice on the use of Smoke and Haze machines.

The safe employment of this machine is strictly the responsibility of the user.

As with all vaporiser principle machines, exit nozzles will be very hot and capable of causing burns. Please take note of the warning labels.

Do not touch or obstruct these nozzles.

Under adverse conditions, tiny particles of hot fluid could issue close to the machine – Never aim at persons or allow such operating conditions to occur, and maintain a 3m safety clearance.

There are ventilation holes at the rear of the machine, these should not be covered or obstructed. Similarly the fan inlet holes on the side of the machine should not be covered and should be allowed enough air space to operate effectively.

The machine should be electrically earthed, and should never be operated or connected to an unsafe supply.

The machine should not be connected to a 'noisy' or spike laden power supply.

Spilled fluid or splashed fluid droplets can be a slip hazard. Comply with regulations when clearing or disposing of fluid.

Take note of any warning/advice notices attached to the fluid containers.

Do not operate the machine with any covers removed.

## Specifications

<b>Power Source Requirements</b>	230VAC 350W 50/60Hz
<b>External Fusing</b>	3.15 AT ceramic
<b>Internal Fusing</b>	500mA PCB transformer
<b>Fluid Capacity</b>	2.5 Litres
<b>Fluid Use</b>	Max 100cc/Hr. Min 1cc/Hr.
<b>Haze Flow Direction</b>	0 to 90 degrees
<b>Fluid Capacity</b>	2.5 Litres
<b>Control</b>	Manual DMX (1-4channels dependent on mode) Wifi & Ethernet
<b>Typical Smoke Output</b>	1100 m <sup>3</sup> /min burst 500 m <sup>3</sup> /min continuous
<b>Machine Dimensions</b>	H.340mm W.160mm D.340mm
<b>Weight (Fluid Not Included)</b>	12 kg

## Fluid Use

Please note that the fluid used with all LeMaitre hazers is not like any other fluid used typically in smoke or hazer machines. It is a high concentration fluid, which other manufacturers' machines are unable to process without incurring damage.

**Do not attempt to water down the haze fluid ... this will lead to inefficient conversion and produce hot fluid particle emission.**

Only Le Maitre Ltd Hazer Fluid should be used. Use of other fluid will cause incorrect operation and could cause toxicity issues.

Replacing fluid merely requires the changing the empty bottle for a new one. Use the screw lid to seal the used bottle and dispose of correctly. Re filling the empty bottle is not advised as this can lead to the introduction of foreign particles which may reduce the efficiency of the external in-line filter. If it is felt that there is a reduction in the performance of the machine then this filter should be un-plugged from the silicon tubing and reversed washed. Never operate the machine with this filter removed.

Any spillage should be cleaned away. The fluid does not require anything other than a water based cleanser.

## **Operating Environment**

The MVS-Smart is an electromechanical assembly containing electronic and mechanical devices. All such devices have reduced life spans under adverse temperature and humidity conditions.

It is always wise to minimize 'risky' operating environments, and provide the machine with similar conditions as would be applicable to any other electronic apparatus.

Good conditions include.

Dry – Free from dust etc – stable – non vibrating – non flammable surroundings – well ventilated – 'normal temperature' – non smoke re-circulation area.

# Operating Procedure

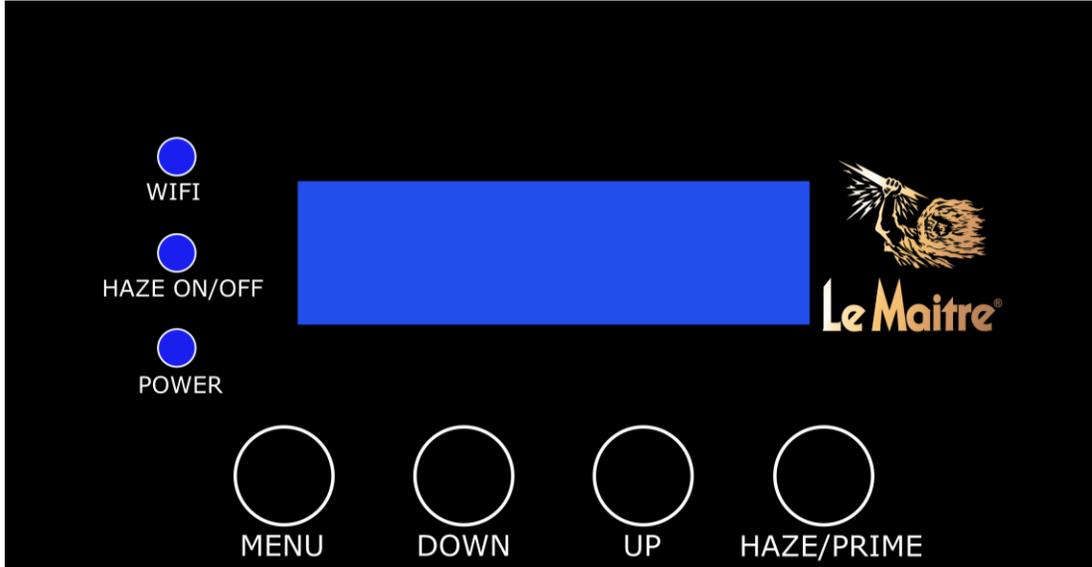


Figure 1 MVS-Smart Control Panel

## Display

The display is an OLED 16x2 display, and provides information as to the operation and settings of the machine. OLED has far superior viewing angle and high-light characteristics to conventional LCD displays.

## LEDs

**POWER** - Illuminates solidly when operating correctly. Flashes when there is an error condition.

**HAZE ON/OFF** - Illuminates when haze is switched on.

**WIFI** – Will illuminate when the unit receives a control command via the Wi-Fi/LAN interface. Once illuminated, it will also quickly flash to indicate successful communications between the MVS Smart and the wireless/wired controlling device.

## Buttons

**MENU** – The MVS-Smart has a simple, single direction, numbered, circular menu. The MENU button is used to enter the menu, and each press will cycle the menu one setting further. Once the end of the menu is reached, it will leave the menu and return to the operating screen. Holding down the MENU button once in the menu, will also leave the menu and return back to the operating screen.

**DOWN** – The DOWN button is only used to change/modify corresponding menu settings down. It has no effect on the menu position like the MENU button does.

**UP** – Similarly, the UP button is only used to change/modify corresponding menu settings up. It has no effect on the menu position like the MENU button does.

**HAZE/PRIME** – This is a dual function button. Its main function is to toggle the haze operation on and off with each press. Its secondary function is to prime the fluid line when held down.

## **Startup Procedure**

There is no specific startup procedure to follow per se. On mains power on, the machine will automatically enter a roughly 2min cleaning cycle, this helps to preserve the Haze tube and clean out any residual fluid and residue that may have built up.

To start hazing in manual mode after the cleaning cycle, simply press the Haze button once.

If DMX is plugged in, it will automatically detect this and begin hazing automatically if set.

## **Shutdown Procedure**

The MVS Haze tube will benefit from correctly following a simply shutdown procedure.

It is recommended to turn off hazing, by either pressing the Haze button in manual mode or zeroing the DMX input, and wait for 30seconds before switching off the mains power to the machine. This will allow the MVS to purge any excess fluid left in the haze tube. A 30seconds countdown will be shown on the display.

Adhering to this procedure has a significant positive effect on the lifetime of the Haze tube.

# Display Menu and Setting Description

The menu accessed manually on the MVS-Smart display, is a simple, single direction, numbered, circular menu.

It starts at menu item 1, and continues to item 20 (this length is likely to change with subsequent software updates as more features are added/modified). In addition, not all the menu items are settings, as some just contain information.

NOTE: The Advanced Options (items 8 onwards) are restricted by default, but can be shown easily by pressing the UP button when prompted.

The menu items are as followed:

## 1. Haze Level

Volume of Haze vapour produced (setting 0-15)

## 2. Projection

Output power of fans effecting projection distance (setting 1-16)

## 3. Direction

Relative direction of fans effecting angle of projected haze (setting 0-90degrees)

## 4. Sweep Speed

Speed of automatic direction variation, sweeping the output of haze. This overrides the Direction setting, and can be set to "Off". If the sweep is on, then the setting of the Direction angle will have the following effect.

0 degrees - sweep will be from 0 to 45 degrees.

45 degrees - sweep will be a full 0 to 90 degrees.

90 degrees - sweep will be from 45 to 90 degrees.

## 5. Set Haze Channel

The DMX channel to control the volume of haze vapour produced.

## 6. Set Projection Channel

The DMX channel to control output power of the fans effecting the projection distance.

NOTE: It may be disabled by trying to select channel 0. When disabled the programmed manual setting will be utilised.

## 7. Set Direction Channel

The DMX channel to control relative direction of the fans effecting angle of the projected haze.

NOTE: It may be disabled by trying to select channel 0. When disabled the programmed manual setting will be utilised.

## 8. Sweep Speed Channel

The DMX channel to control the speed of automatic direction variation, sweeping the output of haze.

NOTE: It may be disabled by trying to select channel 0. When disabled the programmed manual setting will be utilised.

### **9. Errors (Advanced Option)**

Shows the number of errors, and displays error messages for each one. Use the Diagnostics page on the Web Server Interface for more detailed error information.

### **10. Sensor For Blocked Tube (Advanced Option)**

There is an optical fluid sensor situated at the air-pump outlet. In the event on a blocked tube, fluid will be pumped up the air tube (because the hazer element is blocked) by the fluid pump, which can result in flooding the air pump causing it damage. This sensor will detect this event and cut machine operation. The sensor is calibrated in the factory, but in the event that it is not working correctly and perhaps incorrectly disabling the machine, it can be disabled from this setting. Contact LeMaitre if this occurs.

### **11. Sensor For Fluid Level (Advanced Option):**

An optional fluid level sensor can be purchased if monitoring of the fluid level is required. This can be useful in permanent install situations. Once calibrated, it can provide fluid level readings. It will report a warning and flash up a low fluid message on the display should the fluid level drop below a certain level. If this is not required, then it can be disabled from this setting. The fluid level sensor is disabled by default.

### **12. Connectivity Mode (Advanced Option):**

The machine is able to connect to external networks, and to the internet. The connectivity mode can be changed in order to achieve the desired connection type. Before this setting is changed from 'No Connectivity', the 'Scan and Connect' procedure should be run first.

### **13. Calibrate Fluid Sensor (Advanced Option):**

If the optional fluid level sensor located in the fluid bottle cap is present, it should be calibrated for accurate level readings. It is factory calibrated for LeMaitre's Pure Haze fluid, but for best results should be recalibrated with every full fluid bottle change.

Press the UP button begin the calibration procedure

Fully insert the sensor into the full tub of fluid, don't bother screwing the cap on though.

Press the UP button once more.

The machine will prompt the user to pull the sensor fully out of the fluid and drain for 30 seconds.

Once the 30 seconds are up and it says complete, press the UP button again.

Calibration is complete, screw the bottle cap into place.

### **14. Fluid Level (Advanced Option):**

Display what the current fluid level is at. A value of 0-100%.

NOTE: After calibration, and with a full bottle of fluid, this should show 100%. If not, please redo the calibration procedure.

### **15. Version Info (Advanced Option):**

Displays version information. This might be asked for during support requests, and to see if there are any firmware updates available for the machine.

**16. Runtime stats in hours (Advanced Option):**

RT =Uptime of the machine

ST = Haze time, how long the machine has been pumping haze

**17. Reset to default (Advanced Option):**

In the event of a forgotten AP password for the Web Server Interface, or similar issue, it is possible to reset the machine back to its shipped factory settings.

**18. Wi-Fi/Ethernet Status (Advanced Option):**

This shows information on the status of the Wi-Fi processor.

**19. DMX Analyser (Advanced Option):**

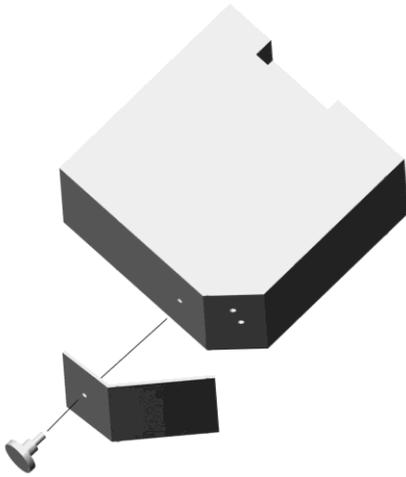
The MVS-Smart has a built in DMX analyser. Press the UP and DOWN buttons to view the signal BREAK and MAB times, the refresh rate and also number of bytes in the DMX packet. This can be helpful to diagnose any DMX signal issues.

**20. Machine Serial Number (Advanced Option):**

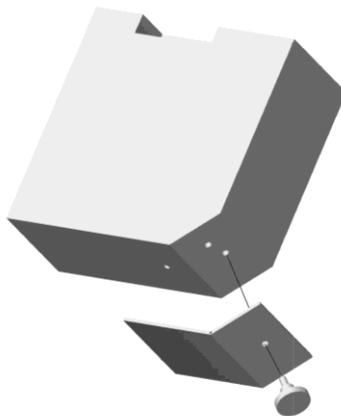
The unique serial number of the machine can be seen here. This may be required for any service/support requests as well.

## Modes of Use and Positioning

The MVS can be used in its standard upright position, with or without the optional fluid carrier attached. Its slim design will take minimal floor space and allow it to be conveniently placed. The variable angle of Haze output will also allow it to be positioned in awkward or unusual sites. Further to this, a detachable base plate will allow the machine to be positioned in a vertical mode but at a 45 degree angle, so that the haze output angle can be varied from 45 to 135 degree coverage. For even more versatility, this base plate can be mounted such that the MVS is at 45 degrees in two planes (as shown on the front page of this manual). This will give a 45 to 135 degree spread at 45 degrees from the horizontal.

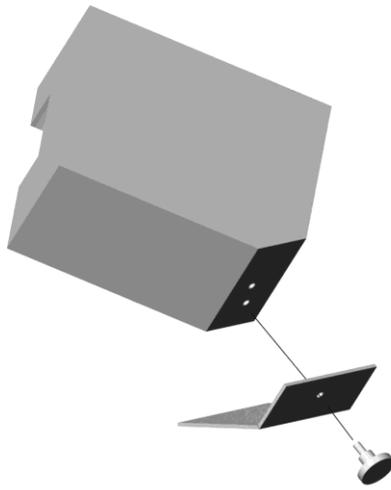


**Figure 2** 45 Degree position



**Figure 3** Standard Position

If required the MVS could lay flat, with the fan air inlet holes facing up.



**Figure 4** 45 Degree Position Plus 45 Degree Tilt

As with any 'hot vapour' type machine, it should never be positioned such that any hot fluid could be projected, or drip onto personnel, and it is the responsibility of the installer / operator to ensure that this cannot occur.

The best continuing performance will be obtained by turning the Haze off and allowing the MVS to purge the fluid feed before turning off the main power source.

## **External Fluid Filter**

This unit fits externally in the fluid supply line, and will normally not require any attention. Should however, the filter become clogged with debris, the performance of the MVS will be reduced. Should this occur, detach the filter and wash in warm soapy water, flush with clean water and re-attach to the silicon supply tubing.

## **Fan System**

Depending upon the environment in which the MVS is used, it may be required to provide some form of scheduled cleaning process of the fan scrolls, in order to maintain the high power and distribution capabilities of the MVS.

All that is required is the removal of the air vent side panel, and a brush and vacuum to clean the two fan scrolls. If the correct conditions are available then the removed dust can just be blown into a collector system.

Dampened dust can build up on the narrow blades of the fan scroll, effectively reducing the efficiency of air movement and therefore needs removing periodically.

How many months between cleaning processes will depend entirely upon the conditions and environment in which the MVS is used.

Please refer to the safety issue mentioned in the Haze tube section.

## Haze Tube

Tube replacement will not be expected, but should it be required, then all the necessary safety precautions should be made before doing so -

- The machine is not connected to the mains supply.

- The machine is placed on a suitable work surface.

- The machine has been allowed to cool for at least 10 minutes.

- The use of correct tools for panel removal and tube replacement.

- The ability to be able to confirm suitability of use after the replacement has been made.

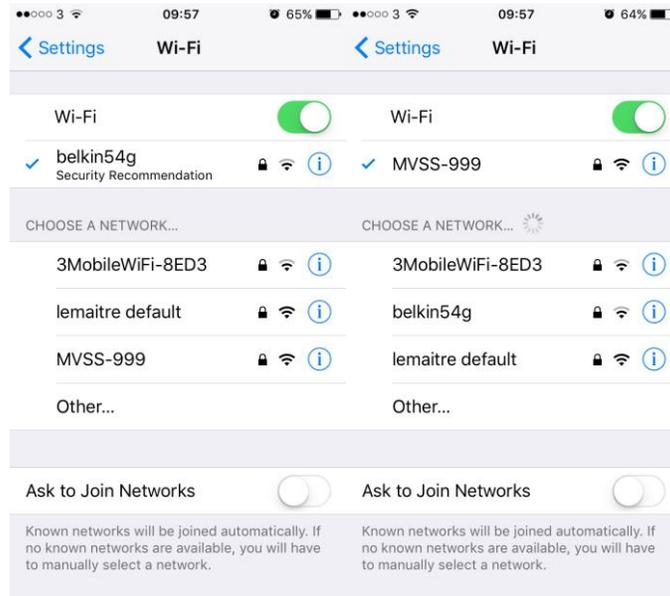
This tube is sited underneath the fan inlet side panel. Removing this side panel will allow easy access and replacement should it ever be required. Two M8 nuts secure the ends of the tube and a quick connector completes the temperature sensor connection. The nuts secure the tube both physically and electrically. It is important that they should not be over tightened whilst at the same time, tight enough to provide a good electrical connection.

Push on silicon tubing supplying the fluid and air drive is easily removed from the input end. It is best to use 'nyties' since this will add security to the fluid and air supply connections.

After tube replacement, and having checked that all parts are as they should be, the tube should be run through a 'bedding in' period, where any tendency to occasionally output very fine fluid particles (if any), will clear.

## Web Server Interface

The MVS-Smart contains its own mini webserver, which can be accessed by joining the Wi-Fi access point (AP) named MVSS-<serial number>. The default password is “MVSSSMART”, but can be changed from the settings page detailed in the following sections.

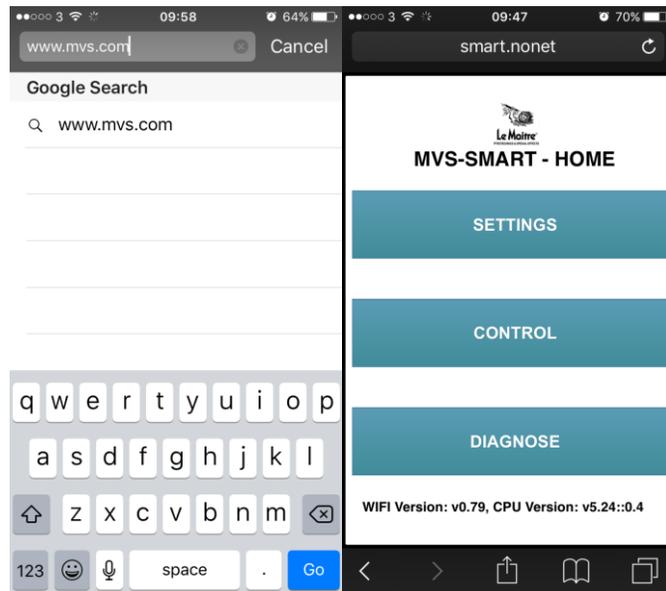


**Figure 5** Connecting to the MVS-Smart Wifi AP

Once connected to the MVS-<serial number> AP with your device, open a browser and enter any of the following URL's (WIFI version 0.79 and up):

- [www.smart.com](http://www.smart.com)
- [www.setup.com](http://www.setup.com)
- [www.control.com](http://www.control.com)
- [www.diagnose.com](http://www.diagnose.com)
- [www.diagnostics.com](http://www.diagnostics.com)
- [www.machine.com](http://www.machine.com)
- [www.mvssmart.com](http://www.mvssmart.com)
- [www.machine.com](http://www.machine.com)
- [www.mvs.com](http://www.mvs.com)

NOTE: Prior to WIFI version 0.79, you will have to enter IP address **192.168.4.1**



**Figure 6** Connecting To The Built In Webservice

This will load up the home screen of the web server as shown above. This IP address will always be the same when connecting to the MVS-<snun> AP.

The web server interface consists of 3 sections:

Settings - View and modify the settings of the machine.

Control – Control the machine from your mobile device

Diagnose – view any error messages and corresponding diagnostic help.

**PLEASE NOTE: ON ALL PAGES, THE LEMAITRE LOGO ACTS AS A HOME BUTTON, THAT WILL ALWAYS NAVIGATE TO THE HOME SCREEN.**

## Settings Page

The MVS-Smart is a versatile, feature rich machine, as such the settings page can be used to view and update everything in one quick and easy step.

This page will pull the current settings from the machine, and so can be used to check configuration as well as set it.

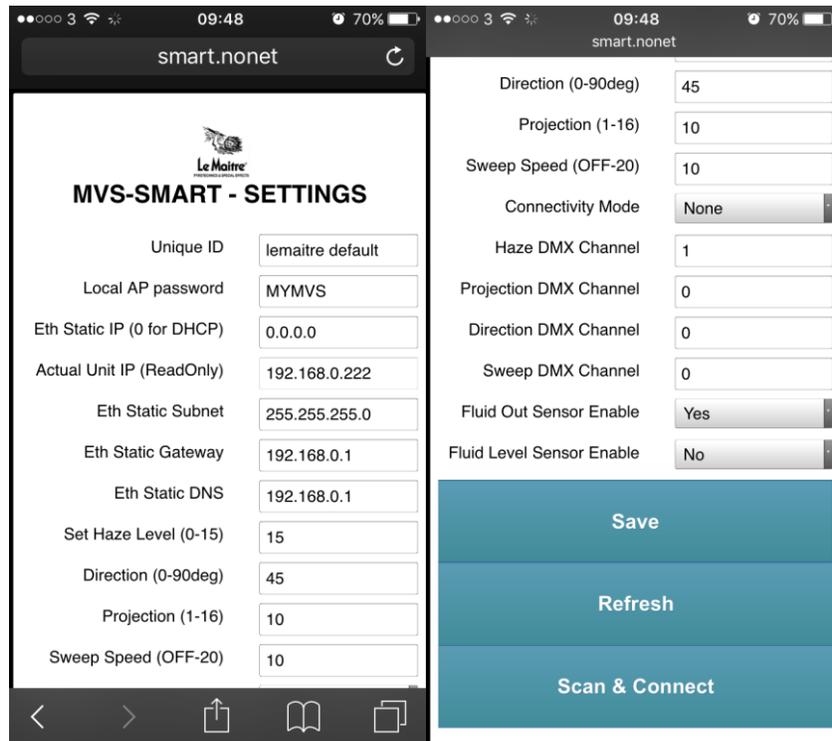


Figure 7 MVS-Smart Webserver Setting Page

### Unique ID:

A totally unique identification code that is assigned by you the customer, and must be common to all your machines in order to view them on the LeMaitre Machine Interface Client program.

### Local AP Password:

Settable password for the web server interface having the Wi-Fi name MVS-<serial number>. Default password is “MVSSMART”. Change this to anything you desire in order to secure the connection to the machine.

### Eth Static IP (0 for DHCP):

For the wired LAN interface, if required to run on a static IP. Only applicable for the LAN port, Wi-Fi is always DHCP. Set to 0.0.0.0 to have DHCP on the wired LAN interface.

### Eth Static Gateway:

Gateway IP for wired LAN interface. Ignored if DHCP is set.

**Eth Static DNS:**

DNS IP for wired LAN interface. Ignored if DHCP is set.

**Connectivity Mode:**

The machine is able to connect to external networks, and to the internet. The connectivity mode can be changed in order to achieve the desired connection type. Before this setting is changed from 'No Connectivity', the 'Scan and Connect' procedure should be run first – see the description on the following page.

**Saving the Settings**

Once all the setting changes are complete, click/press the Save button. This will store the settings onto the MVS-Smart.

The machine may reboot the Wi-Fi processor, if you set the Unique ID or wired Ethernet IP settings. If this occurs, you may have to reconnect to the webserver Wi-Fi point again.

## Scan and Connect

In order to connect the machine to an external WiFi access point, and hence to the LeMaitre MIP, it needs to know the WiFi access point name (SSID) and its password. Use this button to scan for wifi networks that are around, select the SSID and enter the required password and click connect.

For Example - Connecting to the 'LeMaitre-LAN24' WiFi access point.

Step 1: Select your WiFi name/SSID

Step 2: Enter your password

Step 3: Click/press Connect

Step 4: Wait until it connects (refresh the page if it takes longer than a few seconds to update)

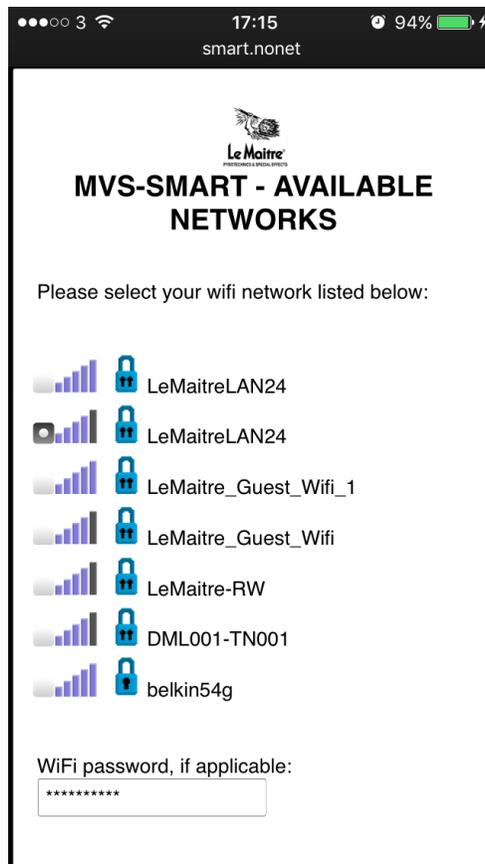


Figure 8

MVS-Smart External Router Connection

## Control Page

The MVS-Smart can also be wirelessly controlled from the Web Server Interface.

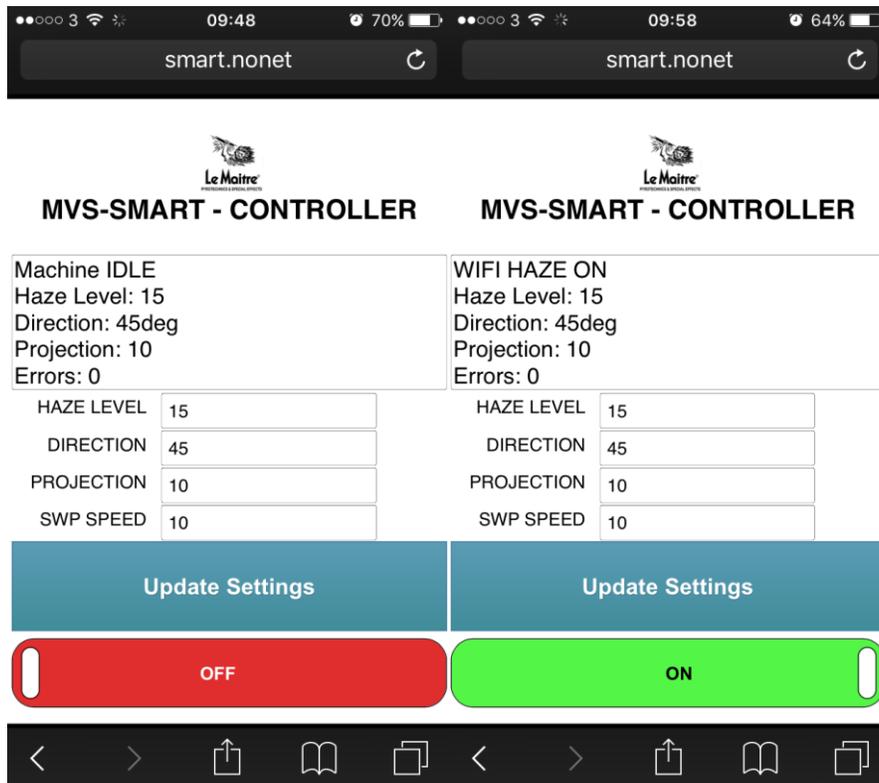


Figure 9 MVS-Smart Webserver Control Page

The control interface, is as simple as possible, but provides all the control functionality required in a remote control.

That is:

- To provide machine status and information
- Set haze level, as well as the direction, projection and sweep speed settings
- Start/Stop operation

It contains a block of text with the current machine state and settings. This block is updated every few seconds.

## Diagnostics Page

The Diagnostics page provides insight into any errors which may occur on the MVS-Smart. This is an attempt at reducing any error down time and speed up support and resolution of errors should they occur.

Below are some screenshots of possible error diagnostics.

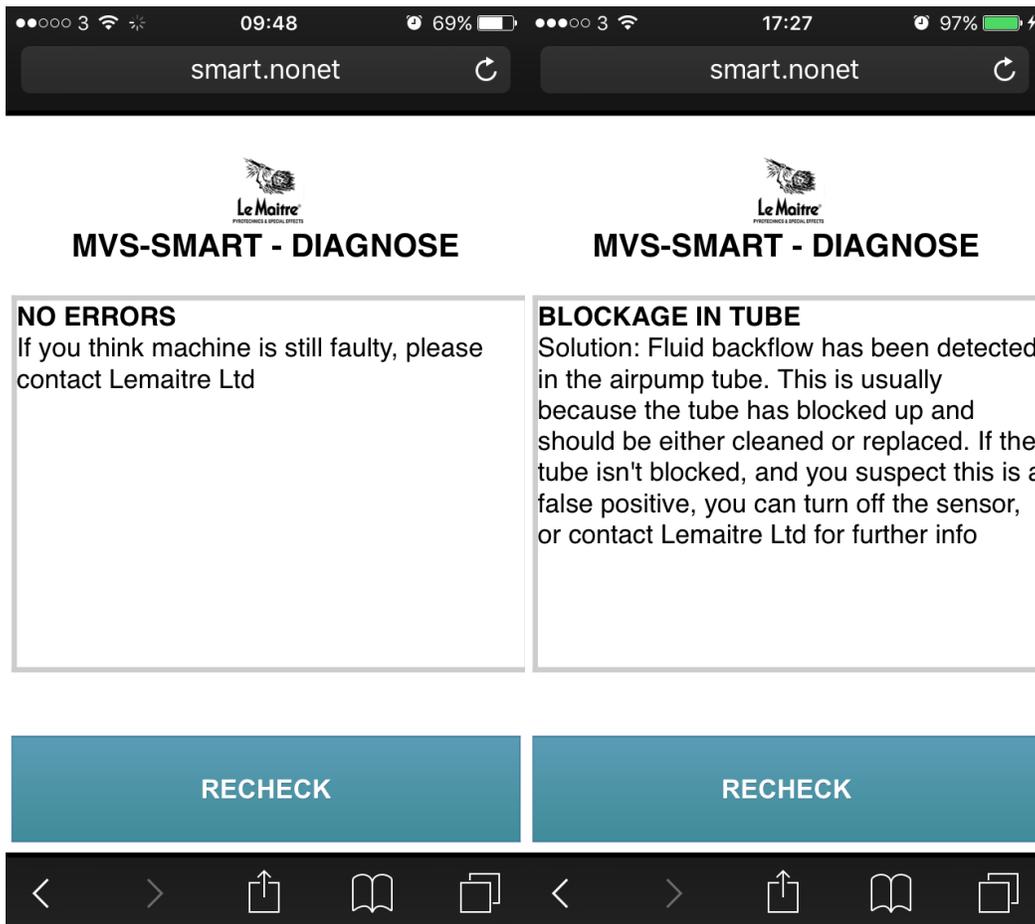


Figure 10 MVS-Smart Webserver Diagnostics Page

## **Connectivity Modes (Advanced Feature)**

The MVS-Smart has a Wi-Fi and Ethernet connection in order to connect it to an internal network (router) and/or the internet - if that router provides internet access.

NOTE: If the Ethernet port is used, it will take preference over the Wi-Fi interface.

### **No connectivity**

If the connectivity mode is set to 'no connectivity', then the machine doesn't attempt to connect to any external network at all.

### **Router (no internet):**

The machine will try to connect to a router. For the Wi-Fi interface it will keep trying to connect to the saved Wi-Fi SSID set up from the Web Server Interface, see details in the following section.

Once connected to the router and assigned an IP address, the machine does nothing further. If your device is on the same network, it is possible to access the machines built-in Web Server Interface from the IP address assigned, which can be viewed from menu item 21.

Please note, if the SSID cannot be found or the machine contains the incorrect password, it will keep attempting to connect regardless for approximately 10 seconds, after which it will stop its attempts for roughly 40 seconds before attempting again for a further 10 seconds. This process continues indefinitely.

### **LeMaitre MIP (Machine Interface Portal):**

LeMaitre's MIP is envisioned to be used to monitor and control (if required, but not necessarily) all machines connected to it, and relay information back to the client program.

Information such as the operating status, all settings, runtime stats, fluid levels, errors, warnings and more can be viewed from the client program.

The MVS-Smart will connect similarly to above, but to connect to LeMaitre's MIP, the network must have internet access and port 19766 must be open. Contact your IT department to check if this port is open.

It is required to group/link the machines together, in order to set which machines can be accessed using the client program. To do this, a 'Unique ID' must be assigned to each set of machines. This 'Unique ID' is common to the machines and the client program, but should be kept secret apart from that.

### **As an installation example:**

Let's say a company has five MVS-Smart machines, spread around a large site such as a theme park. The company name is "Adventures 'R Us", purely fictional. Two of those machines are connected to a Wi-Fi connection which has internet access and the other three are connected through the wired Ethernet port.

They have chosen a Unique ID of "ARU-lemaitre342016".

Machine 1 – programmed settings:

Wi-Fi SSID – “ARU-EastWing”  
Wi-Fi Password – “eastwingsecretpw”  
Unique ID - “ARU-lemaitre342016”

Machine 2 – programmed settings:

Wi-Fi SSID – “ARU-WestWing”  
Wi-Fi Password – “westwingsecretpw”  
Unique ID - “ARU-lemaitre342016”

Machine 3-5 – programmed settings:

Ethernet IP - DHCP (0.0.0.0)  
Unique ID - “ARU-lemaitre342016”

So all 5 machines have different router connections, and also different means of connecting to the internet, but they all share the common site Unique ID.

In the client program now, simply enter the same Unique ID to connect and monitor to all five machines.

Please contact LeMaitre Ltd if you are interested in monitoring your MVS-Smarts or G300-Smarts through LeMaitre’s MIP. We will provide you with the client program, and guide you through the installation process.

## **Warranty**

The Le Maitre® Ltd MVS-Smart is sold with a one year's warranty, which includes parts and labour from the date of purchase. This warranty covers manufacturing defects, providing that the unit has been regularly serviced by an authorised agent and has only used genuine Le Maitre® fluid.

Le Maitre® Ltd considers all of its products to be safe for use in the application it was intended. Le Maitre® Ltd takes no responsibility for misuse or incorrect use. Always refer to the equipment owner's manual for proper use, and be aware of local legislation governing the products use.

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