

Le Maitre® Ltd.

G300-Smart

Operating Manual

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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.

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.

The machine should not be operated with smoke recycling through the ventilation system, as this could cause electronic failure.

G300-Smart Specifications

Power Source Requirements 230VAC 2200W 50/60Hz

Internal Fusing 12 AT ceramic

Fluid Capacity 5 Litres

Control (timed/cont.) Manual

DMX Remote

DMX 0-10V

Wifi & Ethernet

Typical Smoke Output 1100 m³/min burst 500 m³/min continuous

Machine Dimensions 610 x 210 x 295 mm

Weight (Fluid Not Included) 18 kg

Fluid Use

Only Le Maitre® Ltd Smoke Fluids should be used. Use of other fluid may 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 checked and cleaned. 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.

Although the G300-Smart has fluid out sensing, care should be taken to not run without fluid for any length of time as this will cause pump failure. Fluid pump priming should be performed at the maximum smoke output, to ensure a quick and air lock free process.

Operating Environment

The G300-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.

Overview

The G300-Smart is a professional smoke machine designed with the future in mind. Unlike most other smoke machines, the G300-Smart features Wi-Fi and Ethernet connectivity, which enables new and innovative control, setup and monitoring features for the machine.

Building on the solid foundation of Le Maitre's flagship smoke machine, the G300, the G300-Smart retains all the features that have made the G300 the industry-leading unit it is. It is rugged, versatile and durable, with an extremely high output of dense white smoke.

Having Wi-Fi on board gives the user a whole new level of flexibility, being able to set and change the configuration of the unit via a mobile device, such as a phone or tablet. It is also possible to diagnose and debug any errors with the device from a built in webserver, no apps necessary.

In addition to an on-board mini-webserver, the G300-Smart can be monitored and controlled over the Internet through Le-Maitre's Machine Interface Portal. This allows the machine to be controlled and monitored virtually anywhere in the world where there's an internet connection (either wirelessly or through a wired Ethernet connection). This is a powerful feature for reducing maintenance and personnel time costs.

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.

It should be understood that these factors can affect the operation and stability of the Wi-Fi connection.

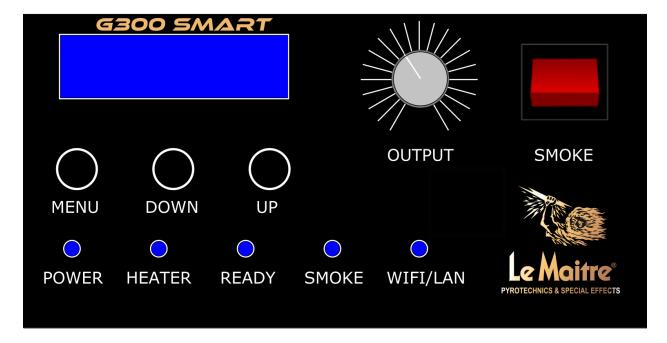
Typical access points can have a range of about 20 meters (66 feet) indoors and a greater range outdoors. Coverage can be as small as a single room with walls that block radio waves, or as large as many square kilometres achieved by using multiple overlapping access points.

Basic Operating Procedure

- 1. The G300 Smart must only be connected to a mains supply capable of sustaining at least 2.5 kW and be adequately earthed. The supply should be "clean" and free of interference.
- 2. The power to the G300 Smart should be controlled by the Mains Power switch located on the rear panel.
- 3. Ensure there is smoke fluid in the machine. Only Le Maitre® Ltd Smoke Fluids should be used.
- 4. Shortly after switching 'ON' the display will read 'G300 Smart', then it will start heating and it will display 'Initial Heating'. The Smoke switch should be in the off position.
- 5. The machine will not operate until it has fully heated. This takes approximately 10 minutes.
- 6. Once the machine has fully heated it will display 'Heating: MAX' and the ready LED will change from flashing to continuously on.
- 7. When the Smoke switch is turned on the machine will start producing smoke after the PreDelay period (5 seconds by default).
- 8. The machine will continue producing smoke until it is switched off or it runs out of fluid.

Manual Interface

The G300-Smart has the on-board control panel which is shown below.



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.

Heater - Illuminates when power is applied to the block heater. If the heater LED is off, it indicates that the block is at maximum temperature, or there is an error condition and the heater has been switched off.

Ready - The ready LED has three states.

- 1) It will be off when the block is at a temperature that is too low to produce smoke.
- 2) Flashing when the block is at a temperature to allow smoke output, but not at full power.
- 3) Solidly on when the block is at maximum/optimal temperature for maximum smoke output.

Smoke - Smoke LED has three states:

- 1) Off when the smoke machine is in an idle state
- 2) Flashing during operation, but not actually outputting smoke (in an interval time for example)
- 3) Solidly on when outputting smoke

Wi-Fi/LAN – 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 G300 Smart and the wireless/wired controlling device.

Buttons

MENU – The G300-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.

Output Control Knob

The output control knob is used to set the desired flow level (1-100%) of the smoke output in manual mode, and specific modes in 0-10V and DMX operation.

SMOKE switch

The smoke switch is used to start/stop the operation of the smoke machine in manual mode.

It also can override and cancel any control via the Wi-Fi/Ethernet interfaces, and hence should be switched to the OFF position if those methods of control are desired.

Display Menu

The menu accessed manually on the G300-Smart display, is a simple, single direction, numbered, circular menu.

It starts at menu item 1, and continues to item 22 (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.

The menu items are as followed:

1) Interval Time

- See/set the interval time of the machine from 0-600 seconds. Interval time is the time in-between smoke output/duration times when the smoke output is off.
- If you set an interval time of 0s, that places the machine into Continuous Mode.

2) **Duration Time:**

• See/set the duration time of the machine from 1-300seconds. Duration is the time in seconds that smoke output is active.

3) **PreDelay Time:**

 See/set the predelay time of the machine from 0-15seconds. The time in seconds, that the CO2 Freezefog power port is powered for before smoke output.

4) DMX Config:

- See/set the current DMX mode. DMX has 4 possible modes (mode 0 − 3) of operation, dependent on the desired method of operation and control.
- If the legacy Gforce 2/3 Timer Remote is used, Mode 0 must be set.

5) Flow Level DMX Channel:

• The DMX channel to control the flow level of smoke output.

6) Smoke On/Off DMX Channel:

- The DMX channel to control the machine on/off.
- NOTE: It may show "disabled" dependent on DMX Mode.

7) **PreDelay DMX Channel:**

- DMX channel for controlling the predelay grey external power port for Freezefog operation.
- Only used in manual DMX mode 3.
- NOTE: It may show "disabled" dependent on DMX Mode.

8) Heater Mode:

• The heater can be turned on/off on the G300-Smart. This is mainly for set installations where the machine might be left on for hours, perhaps 24/7. The heater is able to be controlled by the machine itself in "auto" mode (usual operation), or DMX (assign a DMX channel as well), or via the LeMaitre MIP from the client program.

9) **Heater DMX Channel**:

- Set the DMX channel for controlling the heater.
- NOTE: Only used if the Heater Control Mode is on DMX, otherwise irrelevant what setting it is on.

10) Enable Remote:

• The legacy Gforce 2/3 Timer remote can be used with the G300-Smart, plugged into the DMX IN/REMOTE port. In order for the remote to have power, it must be enabled from this setting.

11) Fluid Out Sensor:

• There is an optical Fluid Out Sensor on the input fluid tube, in order to detect and cut out the machine if running dry. This 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.

12) Fluid Level Sensor:

A fluid sensor is present and attached to the fluid bottle cap. Once calibrated
correctly for the fluid type, 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.

13) **Errors**:

 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.

14) 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.

15) **0-10V Mode**:

• Similarly to the DMX mode, the 0-10V interface has 3 modes (0-2) of operation. Switch between them using this setting.

16) Calibrate Fluid Sensor:

- The fluid sensor located in the fluid bottle cap, must be calibrated for whatever fluid type is used. It is factory calibrated for LeMaitre's Global Smoke Fluid, but for any other fluid should be calibrated accordingly.
- 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.

17) Fluid Level:

- 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.

18) **Version Info**:

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

19) Runtime stats in hours:

- RT =Uptime of the machine
- ST = Smoke time, how long the machine has been pumping smoke

20) Reset to default:

• 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.

21) Wi-Fi/Ethernet Status:

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

22) Machine Serial Number:

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

DMX Modes

When operating the machine using DMX, there are 4 different modes that can be used.

Mode 0:

This mode operates the machine using one DMX channel ONLY, the flow level DMX channel, set using option 5 in the menu. The rest of the DMX channels are ignored/disabled.

Once a value larger than 0 is set, operation is started. The power output (Freezefog) is energized for the set predelay time, and once the predelay time has elapsed, the machine will output smoke at a level set on the channel, anything from 1-100%. To turn off operation, set the DMX value to 0.

NOTE: This mode is required whenever the wired timer remote is used.

Mode 1:

This mode operates the machine using one DMX channel ONLY. It uses the Smoke On/Off DMX channel, see menu item 6. It uses this channel purely as an on/off switch, and utilises all the pre-programmed timing settings and flow level set on the machine.

Mode 2:

This mode operates the machine using two DMX channels. It utilises the Flow Level DMX channel (menu item 5) to set the flow level, and the Smoke On/Off DMX channel (menu item 6) to start/stop operation. For Freezefog operation, it utilises the programmed predelay timing setting. This is the only timing value that is used.

Mode 3:

In this mode the machine uses all three DMX channels, for fully manual operation. It uses the Flow Level DMX channel (menu item 5) to set the smoke output level, the Smoke On/Off DMX channel (menu item 6) to turn on/off smoke output, and the PreDelay DMX Channel (menu item 7) to activate the Freezefog power output. Each channel is independent of each other and any timing values.

0-10V Modes

When operating the machine using the 0-10V interface, there are 3 different modes that can be used. These modes operate in the exact same fashion the DMX modes, with the only exception being there is no Mode 3 (manual mode).

Mode 0:

This mode operates the machine using the flow level input only.

Once a value larger than a few hundred mV is seen, operation is started. The power output (Freezefog) is energized for the set predelay time, and once the predelay time has elapsed, the machine will output smoke at a level set on the channel, up to 100%. To turn off operation, set the input to 0V.

Mode 1:

This mode operates the machine using the Smoke On/Off input only. It uses this input purely as an on/off switch, and utilises all the pre-programmed timing settings and flow level set on the machine.

Mode 2:

This mode operates the machine using both inputs. It utilises the Flow Level input to set the flow level, and the Smoke On/Off input to start/stop operation. For Freezefog operation, it utilises the programmed predelay timing setting. This is the only timing value that is used.

0-10V Pin Functions:

Pin 1 – Common

Pin 2 - Smoke On

Pin 3 – Flow

Heater Modes

There is the possibility on the G300-Smart to turn the heater 'on' or 'off'.

This feature is mainly envisioned for set installations where the machine might be left on for hours, perhaps even 24/7, and being able to turn off the heating element during times where the machine is inactive can both prolong the life of the heating block, but also save significant power costs.

The heater is able to be controlled by:

- The machine itself in "auto" mode (this is normal operation)
- DMX (please assign a DMX channel, see menu item 9)
- The LeMaitre Machine Interface Portal, from the client program.

NOTE: Any time the heater is turned on form being off, it will 'lock out' the machine from operation until the block has reached its maximum temperature again. If this happens from the block being at room temperature, this delay can several minutes.

Connectivity Modes

The G300-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 G300-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 G300-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"

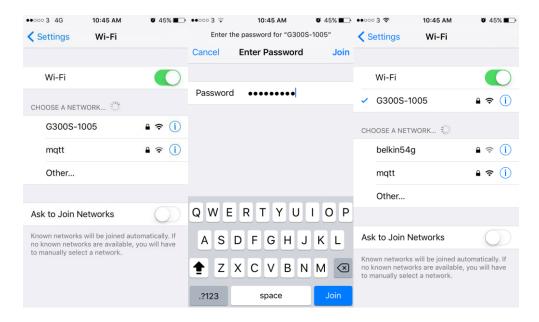
So all 5 machines have different router connections, and also different means of connecting to the internet, but they all share the common site Unique ID.

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 G300-Smarts through LeMaitre's MIP. We will provide you with the client program, and guide you through the installation process.

Web Server Interface

The G300-Smart contains its own mini webserver, which can be accessed by joining the Wi-Fi access point (AP) named G300S-<serial number>. The default password is "G300SMART", but can be changed from the settings page detailed in the following sections.



Once connected to the G300S-<serial number> AP with your device, open a browser and enter the IP address **192.168.4.1** to load up the home screen of the web server as shown below. This IP address will always be the same when connecting to the G300S-<snum> AP.

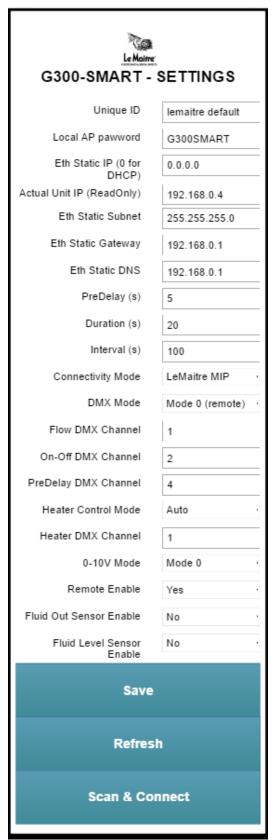


The web server interface consists of 3 sections:

- 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 G300-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.

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 G300S-<serial number>. Default password is "G300SMART". 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.

PreDelay (s):

 The time in seconds, that the CO2 Freezefog power port is powered for before smoke output.

Duration (s):

• The time in seconds that the smoke output is active for repeating smoke bursts.

Interval (s):

• The time in seconds between repeating smoke bursts where the smoke output is not active.

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.

DMX Mode:

• DMX has 4 possible modes (mode 0 – 3) of operation, dependent on the desired method of operation and control.

Flow DMX Channel:

The DMX channel to control the flow setting.

On/Off DMX Channel:

• DMX channel that controls the smoke output of the machine on/off. This is the same as switching the red switch on the control panel on/off.

PreDelay DMX Channel:

• DMX channel for controlling the predelay grey external power port for Freezefog operation. It can only be used in manual DMX mode 3.

Heater Control Mode:

• The heater on the machine can be turned on/off on the G300-Smart. This is mainly for set installations where the machine might be left on for hours, perhaps 24/7. The heater is able to be controlled by the machine itself in "auto" mode (usual operation), or DMX (assign a DMX channel as well), or via the LeMaitre MIP from the client program.

Heater DMX Channel:

• Set the DMX channel for controlling the heater. Only used if the Heater Control Mode is on DMX.

0-10V Mode:

• The 0-10V interface has 3 modes (0-2) of operation. Switch between them using this setting.

Remote Enable:

• The legacy Gforce2/3 Timer remote can be used with the G300-Smart, plugged into the DMX IN/REMOTE port. In order for the remote to have power, it must be enabled from this setting.

Fluid Out Sensor:

• There is an optical Fluid Out Sensor on the input fluid tube, in order to detect and cut out the machine if running dry. This 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 is this occurs.

Fluid Level Sensor:

A fluid sensor is present and attached to the fluid bottle cap. Once calibrated
correctly for the fluid type, 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.

Saving the Settings

Once all the setting changes are complete, click/press the Save button. This will store the settings onto the G300-Smart.

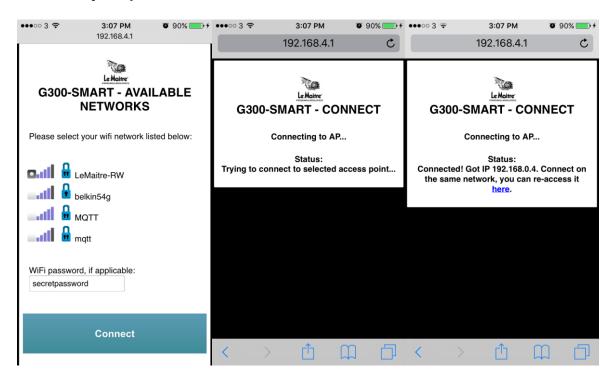
The machine may reboot the Wi-Fi processor, if you set the Unique ID or wired Ethernet IP settings. If this occurs, you may have to reconnect to the webserver Wi-Fi point again.

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.

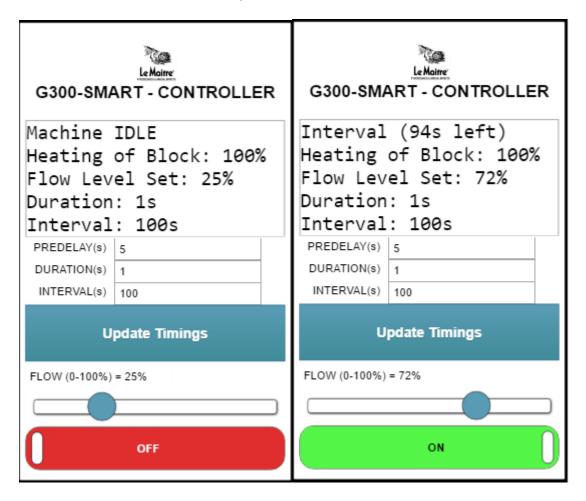
For Example - Connecting to the 'LeMaitre-RW' WiFi access point.

- 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)



Control Page

The G300-Smart can also be wirelessly controlled from the Web Server Interface.



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

That is:

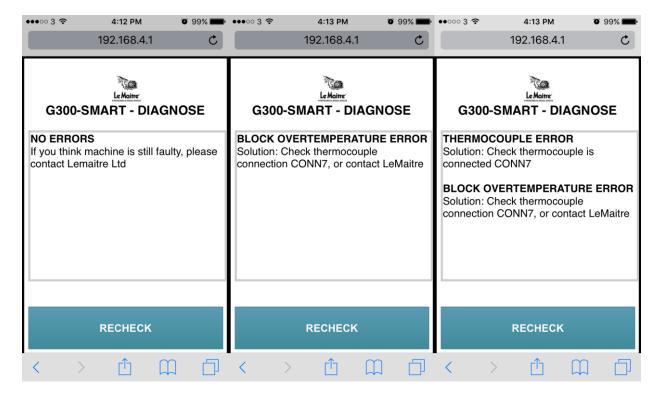
- 1) To provide machine status and information
- 2) Set timing settings
- 3) Set the flow setting
- 4) Start/Stop operation

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 G300-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.



Warranty

The Le Maitre® Ltd G300-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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