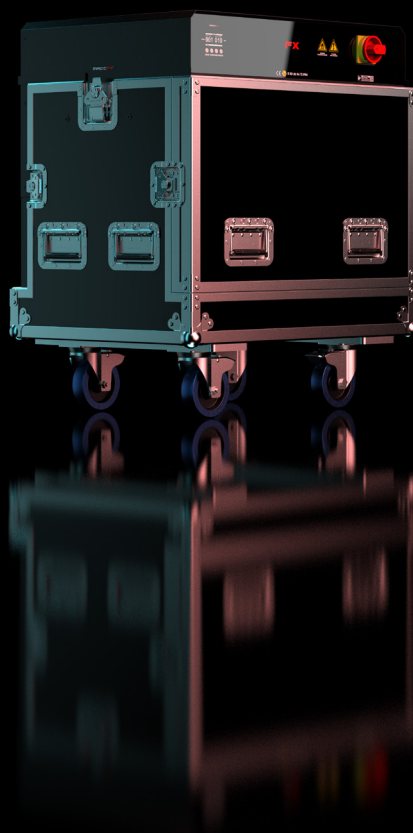


/LIQUID FLAME. SYSTEM.®



FLAME FX

PART01881

rev 01-00

DISCLAIMER

WARNING

Read this manual carefully before installing and/or using this product. Failure to read the manual and to follow the printed instructions may lead to personal injury and/or damage to the product.

© 2023 MAGICFX®
All rights reserved.

Nothing from this publication may be copied, reproduced and/or published by means of printing, photocopying or by any other means, without the prior written approval of MAGIC FX.

MAGIC FX reserves the right to modify specifications stated in this manual.

TRADEMARKS

Any brand names mentioned in this manual are registered trademarks of their respective owners.

LIABILITY

MAGIC FX accepts no liability for claims from third parties arising from unauthorised use, use other than that stated in this manual, and use other than in accordance with the General Conditions registered at the Chamber of Commerce.

We further refer to the General Conditions. These are available on request, free of charge.

Although considerable care has been taken to ensure a correct and comprehensive description of all relevant components, the manual may nonetheless contain errors and inaccuracies.

Should you detect any errors or inaccuracies in the manual, we would be grateful if you would inform us. This helps us to further improve our documentation.

TABLE OF CONTENTS

Disclaimer	2
Trademarks	2
Liability	2
Introduction	4
Target group	4
Other documentation	5
Language	5
Abbreviations	5
Revision table	5
1 Description	6
1.1 System description	6
1.2 System components	6
1.3 Pump station	8
1.4 Fuel	11
1.5 Accessories	11
1.6 ARM control	12
1.7 DMX control	12
1.8 Display panel	13
1.9 RDM capability	16
2 Safety	17
2.1 General safety rules	17
2.2 Indoor/outdoor use	17
2.3 Rigging	18
2.4 Safety symbols	18
2.5 Safety precautions	18
3 Installation and use	21
3.1 Install the system	21
3.2 Connect the system	21
3.3 Assigning DMX addresses to flame heads	22
3.4 Install an external filling pump (optional)	23
3.5 (Re)fill with fuel manually	23
3.6 Fire with DMX	24
3.7 Use the emergency stop	25
3.8 Draining the system	25
4 Troubleshooting	27
5 Maintenance	28
6 Correct disposal	28
7 EC Declaration of Conformity	29

INTRODUCTION

This manual contains all information required for the intended use of the equipment. Deviation from the described intended use can result in a hazardous situation and/or property damage.

This manual includes notes and warnings on safe operation of the equipment. These notes and warnings are accompanied by the following icons. Read them attentively!

⚠ DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

⚠ WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

TARGET GROUP

This manual is targeted at authorised personnel in the event industry that install and operate the LIQUID FLAME SYSTEM and the required ARM SYSTEM.

Authorised personnel are those who:

- Are appointed by their supervisor to install and/or operate LIQUID FLAME SYSTEM and the related ARM SYSTEM at the event.
- Are trained in recognizing and avoiding hazards related to SFX applications at events.
- Are familiar with the safety instructions of each involved ARM SYSTEM component.
- Are familiar with and abide by the applicable local, national and international laws and regulations.

OTHER DOCUMENTATION

Document	Document number
HELLFIRE Head User and Installation Manual	PART01880
FLAMEBLAZER Head User and Installation Manual	PART01877
ARM SYSTEM Configuration Manual	PART02323
ARM CONTROLLER User and Installation Manual	PART01882

Other related documentation

LANGUAGE

This document contains the original instructions in English. In case you require other languages please contact MAGIC FX.

ABBREVIATIONS

Abbreviation	Description
SFX	Special effects
DMX	Digital Multiplex
RDM	Remote Device Management
ARM SYSTEM	MAGICFX® SFX SAFETY ARM SYSTEM
ARM CONTROLLER	MAGICFX® SFX SAFETY ARM CONTROLLER
E-STOP	MAGICFX® SFX SAFETY E-STOP
TERMINATOR	MAGICFX® SFX SAFETY TERMINATOR
LIQUID FLAME SYSTEM	MAGICFX® LIQUID FLAME SYSTEM
PUMP STATION	MAGICFX® LIQUID FLAME PUMP STATION
HELLFIRE	MAGICFX® HELLFIRE
FLAMEBLAZER	MAGICFX® FLAMEBLAZER

Abbreviations

REVISION TABLE

Doc nr	Revision	Date	Description	Author	Approved
PART01881	01-00	26-09-2023	Initial Release	MBO	JVG

1 DESCRIPTION

1.1 SYSTEM DESCRIPTION

The LIQUID FLAME SYSTEM is a SFX system for controlled emission of flames. The system consists of an electric pump unit with an internal 100L tank that feeds pressurized liquid fuel to one or more compatible flame heads. The liquid fuel is ejected from the flame head nozzle across spark ignition probes to produce the flame. MAGIC FX offers several compatible flame heads, each with its own unique flame characteristics.

The LIQUID FLAME SYSTEM is operated with DMX and RDM and can be operated in sequence with multiple systems. Furthermore, the LIQUID FLAME SYSTEM is configured for safety control with an ARM SYSTEM. The LIQUID FLAME SYSTEM can handle the DMX signal and the ARM signal separately, or receive the combined DMX+ARM signal. Additional ARM devices such as the E-STOP and the BEACON can be incorporated anywhere in the DMX, DMX + ARM, or DATA lines. Refer to the schemes of two example setups on page 7 for more details.

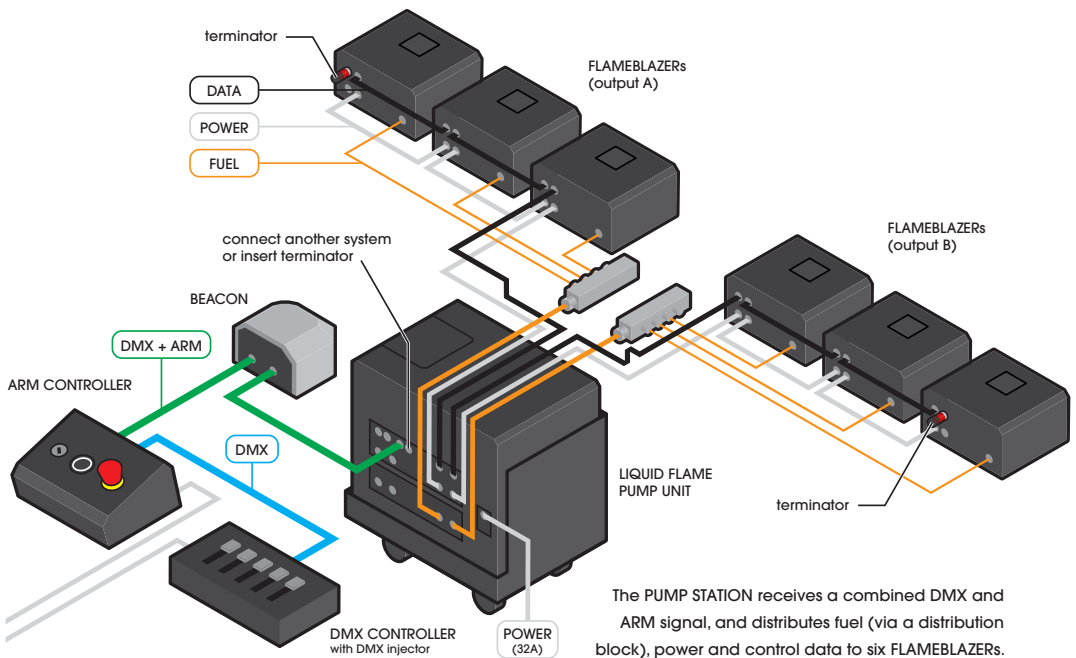
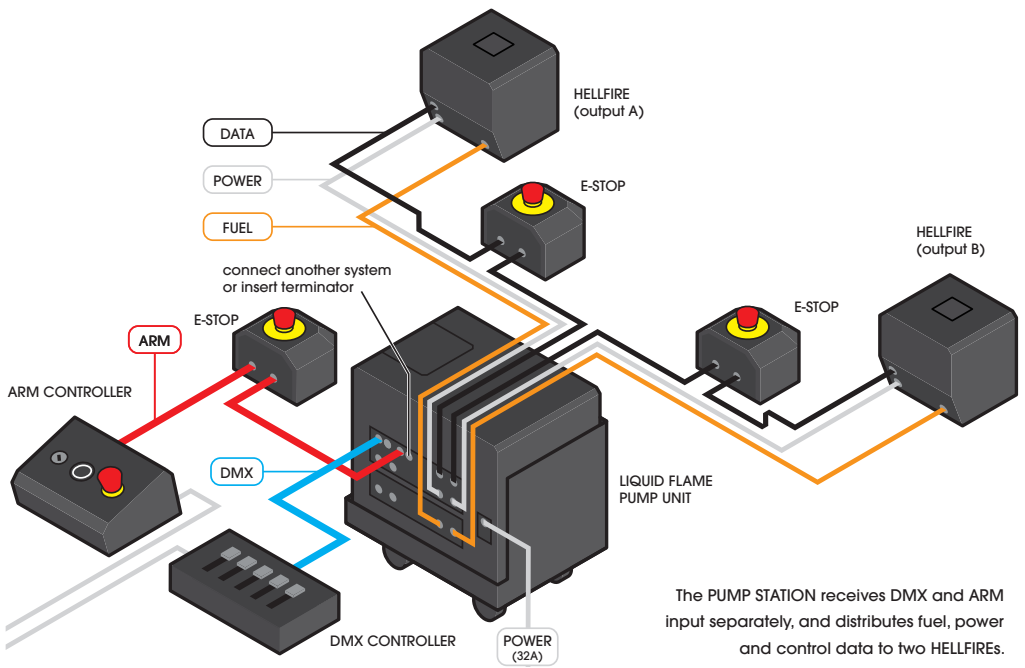
For more information about the ARM SYSTEM and to learn how to configure a complete safety system, refer to the ARM SYSTEM Configuration Manual (PART02323).

1.2 SYSTEM COMPONENTS

Product name	Application	Product code	Remarks
PUMP STATION	Feed flame heads with pressurized fuel Control and power flame heads	MF1420	
HELLFIRE	Flame head 15 m	MF1421	max. 2 units per PUMP STATION
FLAMEBLAZER	Flame head 6/8/10 m	MF1401	max. 16 units per PUMP STATION
ARM CONTROLLER	Arm/disarm Emergency stop Reset ARM SYSTEM	MF3220	required for operation
E-STOP	Additional emergency stop	MF3222	optional
BEACON	Additional arm/disarm signaling	MF3221	optional
External filling pump	Fill PUMP STATION tank with fuel	MF1422	optional

LIQUID FLAME SYSTEM components

For instructions regarding the flame heads, refer to the corresponding user and installation manual. See Other documentation on page 7.



1.3 PUMP STATION

The PUMP STATION functions as the fuel, power and control hub of the LIQUID FLAME SYSTEM. The PUMP STATION has two output groups (A/B) with each one fuel, one power and one data output. Each output group can serve one flame head or a line of flame heads, depending on their fuel consumption and build.

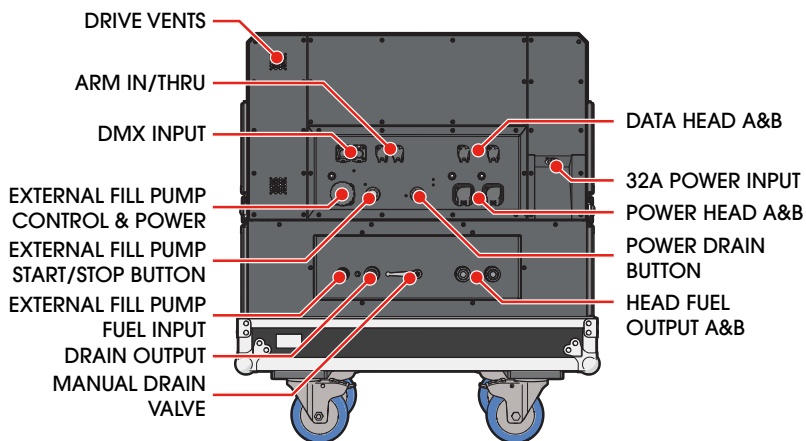
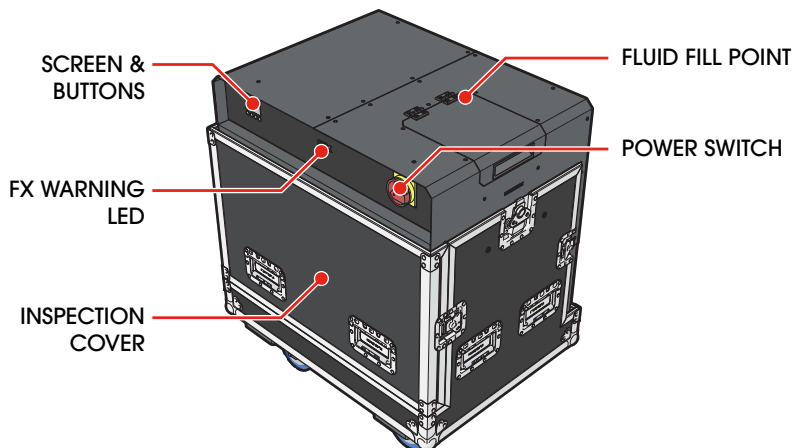
The internal pump unit draws liquid fuel from the internal 100L tank, and feeds pressurized fuel to the connected flame head(s) through hoses. The PUMP STATION requires a 32A power supply. Each output group has one power output, through which the PUMP STATION distributes the required power to the connected flame head(s).

The PUMP STATION is operated with DMX and RDM and can be operated in sequence with multiple systems. On basis of the DMX input, the PUMP STATION controls the behavior of the flame head(s).

The PUMP STATION is configured for safety control with an ARM SYSTEM. The LIQUID FLAME SYSTEM can handle the DMX signal and the ARM signal separately, or receive the combined DMX+ARM signal. Each output group for the flame head(s) has one data output that combines the control data and the ARM signal. Refer to the schemes of two example setups on page 7 for more details.

For more information about the ARM SYSTEM and to learn how to configure a complete safety system, refer to the ARM SYSTEM Configuration Manual (PART02323).

MAIN PARTS



Main parts

TECHNICAL DATA

Product	Product Name	LIQUID FLAME SYSTEM	
	Product Code	MFX1420	
	Product Type	FLAME FX	
Dimensions	Length x Width x Height	800 x 600 x 960 mm	31.4 x 23.6 x 37.8 in
Weight	Empty Weight	178.5 kg	394 lbs
	Full Weight	278.5 kg	613 lbs
Environment	Minimum Temperature	-10 °C	14 °F
	Maximum Temperature	50 °C	122 °F
	Humidity (Relative)	20 % to 90 % (non condensing)	
Electrical	Voltage Input	220-250 Vac	
	Voltage Frequency	50-60 Hz	
	Power Consumption	2300 W + sum of connected flame heads	
	Power Connector	Neutrik® powerCON 32A	
Controlling	Control Options	DMX	
	Control Protocols	DMX512-A (ANSI E1.11) RDM (ANSI E1.20)	
	Control Connectors	Neutrik® 5-pole male/ female XLR	
Safety controlling	ARM Connector	Neutrik® etherCON, RJ45 (in&out)	
Configuring	Configure Options	On Device & RDM	
Usage	Consumable(s)	Isopropanol, ISOPAR G, H & L	
	Consumable Consumption	Depends on the connected heads	

Technical data

PRODUCT IDENTIFICATION

MAG:CFX®
MFX1420 - LIQUID FLAME PUMP STATION
Weight: 179kg / 395lb. (empty)
Power: 220-250Vac 50-60Hz 2300W
Remove fuel for transport

Build date: 2309
Serial: 00001
SIZE CM: 96x79x60
SIZE IN: 38x31x24


8 7 1 9 3 2 3 5 7 6 6 0 5




MAGIC FX B.V. Schouwrooij 27 5281RE Boxtel The Netherlands

Type plate

NOTICE

For more information on the liquid flame system components, please refer to the manuals of the flame heads.

1.4 FUEL

The LIQUID FLAME SYSTEM uses two types of fuel to create the effect. The fuel is loaded via the fuel fill cap at the fluid fill point, or with the external filling pump.

NOTICE

Only use these types of fuel: Isopropanol, ISOPAR G, H & L. The use of other fuels or water may degrade the performance of the machine or cause internal damage.

⚠ CAUTION

Fuels are highly flammable and must be handled with caution and in accordance with local health and safety regulations. Always follow the safety instructions from the fuel packaging when handling and working with the fuel.

1.5 ACCESSORIES

Code	Product	Included
MF3223	Terminator	
MF0347	External filling pump cable - 10 m	
MF0348	External filling pump cable - 20 m	
MF1474	Fuel distribution block (only for FLAMEBLAZER heads)	
MF147x	Fuel hose 3/8" OR 5/8" (1/2" OR 1/4" coupling) - 5/10/20/30/50 m	

Accessories

Please contact MAGIC FX for additional possibilities.

For information about the accessories of the ARM CONTROLLER (MF3220), refer to the ARM CONTROLLER User and Installation Manual (PART01882). For information about the accessories of the flame head, refer to the corresponding user and installation manual. See Other documentation on page 11.

1.6 ARM CONTROL

NOTICE

The LIQUID FLAME SYSTEM cannot be operated without connection to an ARM CONTROLLER in an ARM SYSTEM.

The LIQUID FLAME SYSTEM is configured for safety control with an ARM SYSTEM. The PUMP STATION cannot be operated without the safety signal from the control unit of the ARM SYSTEM: The ARM CONTROLLER. When there's no signal, the internal relief valve of the PUMP STATION opens and the system depressurises immediately. The flame head valves and ignition are also disabled instantly. This prevents the LIQUID FLAME SYSTEM from producing high-risk SFX output. As a result, any related hazard/or property damage is stopped and prevented.

The ARM CONTROLLER is equipped with a key switch to arm/disarm the connected SFX system(s), an emergency stop button, and a reset button. The ARM SYSTEM is wired with EtherCON cables that carry the safety signal from the ARM CONTROLLER.

For more information about the ARM SYSTEM and to learn how to configure a complete safety system, refer to the ARM SYSTEM Configuration Manual (PART02323).

For more information about the ARM CONTROLLER and to learn how to correctly set up and use the ARM SYSTEM, refer to the ARM CONTROLLER User and Installation Manual (PART01882).

1.7 DMX CONTROL

The PUMP STATION and all heads are controlled with 1 enable address.

DMX address	Address range	Control
Enable address	1 - 512	PUMP STATION enable/disable
Start address	1 - 512	Assigned flame head

DMX addresses

The enable address cannot be the same as one of the operational addresses. Each flame head is controlled with their own operational address (assigned via the menu). Operating of these addresses results in the following:

DMX address	DMX Value (decimal)		Result
Enable address	0	99	Device disabled
	100	154	Device enabled
	155	255	Device disabled
Start address (Effect trigger)	0	199	No output
	200	255	Output effect

Operation of the DMX addresses

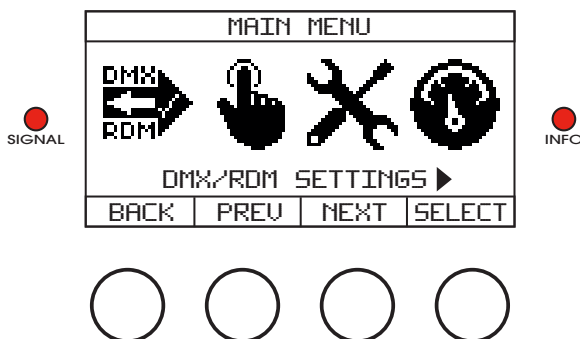
NOTICE

The maximum continuous duration of the effect is 5 seconds. After this period the effect will stop automatically. To start the effect again you must disable and re-enable the Effect trigger.

NOTICE

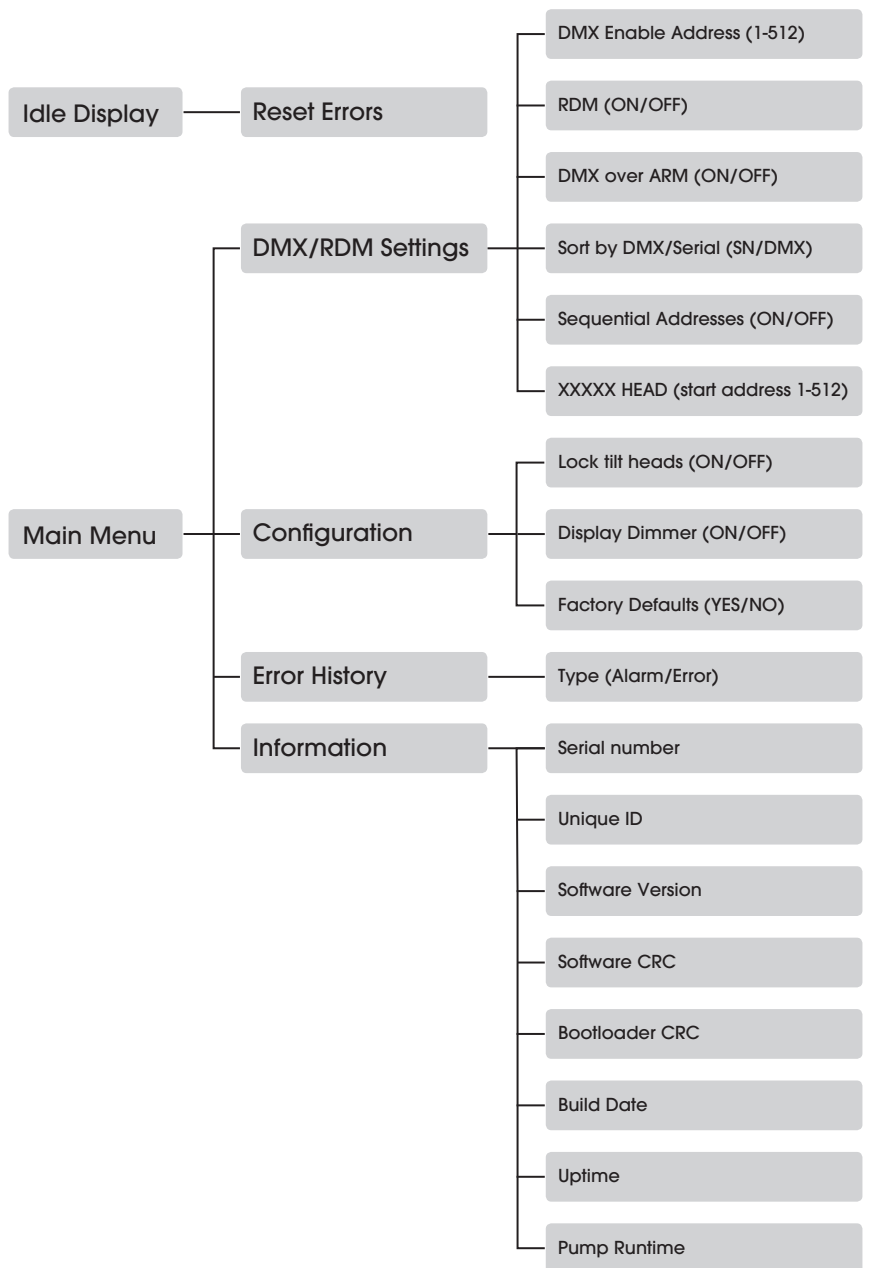
Always plug in a DMX Terminator into the DMX output of the final unit in the control sequence. Using a DMX Terminator improves signal reliability.

1.8 DISPLAY PANEL



Display panel

The display panel is located on the front side of the PUMP STATION. Check the following menu structure for all options in the menu. Use the buttons for navigation and selection. The signal LED blinks red when DMX signal is active. The info LED continuously lights red when an error is present.



Menu structure

Menu function	Explanation
Reset Errors	In case there is a locking error present, this button will reset the appliance. If the fault does not persist, the locking error will not reappear.
DMX Enable Address (1-512)	Setting the DMX Enable Address for the PUMP STATION.
RDM (ON/OFF)	Use this function to turn on/off the RDM functionality.
DMX over ARM (ON/OFF)	If a combined DMX and ARM signal is used, set this option to ON. If the DMX signal runs separately, set this option to OFF. Make sure the DMX over ARM settings match your wiring setup.
Sort by DMX/Serial (SN/DMX)	Sort connected head based on their serial number (SN) or based on their DMX start addresses (DMX).
Sequential Addresses (ON/OFF)	Enabling this will update all head addresses in sequential order when changing the start address of a head.
XXXXX HEAD (start address 1-512)	Set the start address of a head. XXXXX displays the serial number of the head (e.g. 12345), while HEAD displays the head type (e.g. HELLFIRE, FLAMEBLAZER).
Lock tilt heads (ON/OFF)	Use the lock tilt to lock the angle position of all connected heads. The head and pump will display an error when the head tilts more than 5 degrees from the locked position. The error is cleared when the head repositions itself to within the range. When this function is OFF, the error will only display when the tilt is outside given bounds.
Display Dimmer (On/Off)	Turn display dimmer on or off. If turned on, the display is dimmed automatically 30 seconds after the last button push.
Factory Defaults (Yes/No)	Restores the appliance factory default settings.
Type (Alarm/Error)	Toggle between the occurred locking error (Alarm) list, and blocking error (Error) list. Locking errors need intervention by user, although they are "auto-reset" 3 times before the appliance remains in error until reset by user. Blocking errors clear when the triggering fault disappears. 16 locked, and 16 blocked errors are logged. Top of the list shows the last occurring error.
Serial Number	Appliance serial number as also printed on the appliance label.
Unique ID (HHHHHHHHHH)	UID number as the appliance appears in the RDM device list after running discovery.
Software Version	Installed software version.
Software CRC	CRC of the functional software.
Bootloader CRC	CRC of the bootloader software.
Build Date	Release date of functional software.
Uptime (DDDD:HH:MM:SS)	Time counter which indicates how long the appliance has been powered in total.
Pump Runtime (DDDD:HH:MM:SS)	Time counter which indicates how long the effect has been on in total.

Menu functions

1.9 RDM CAPABILITY

Remote Device Management Protocol (RDM) is an enhancement of the DMX512 communication protocol. RDM can be used for configuration and status monitoring while DMX512 takes care of the default controlling.

For RDM you will need a RDM compatible controller.

The following RDM parameters are supported by the LIQUID FLAME SYSTEM.

Parameter ID	Discovery	GET	SET
DISC_UNIQUE_BRANCH	X		
DISC_MUTE	X		
DISC_UN_MUTE	X		
DEVICE_INFO		X	
SUPPORTED_PARAMETERS		X	
SOFTWARE_VERSION_LABEL		X	
DEVICE_MODEL_DESCRIPTION		X	
MANUFACTURER_LABEL		X	
SLOT_DESCRIPTION		X	
DMX_PERSONALITY_DESCRIPTION		X	
SENSOR_DEFINITION		X	
SENSOR_VALUE		X	
DMX_START_ADDRESS		X	X
IDENTIFY_DEVICE		X	X
DEVICE_LABEL		X	X
FACTORY_DEFAULTS		X	X
DMX_PERSONALITY		X	X
RESET_DEVICE			X

RDM parameters

RDM parameters are subject of change due to software updates. Contact MAGIC FX for the latest information and updates.

Sensor	Description
Status	Shows the enabled status of the system. 0 = idle, 1 = armed, 2 = enabled.
Error sensor	0 = no error. All other numbers indicate an error.
Tank level	Displays the current tank level in %.

Sensors

2 SAFETY

The LIQUID FLAME SYSTEM has been designed and constructed in such a manner that it can be used safely. This applies to the use, the circumstances and the regulations as described in this documentation. Reading this documentation and following the instructions are therefore necessary for everyone who is authorised to work with the LIQUID FLAME SYSTEM.

The LIQUID FLAME SYSTEM must be used in surroundings that:

- Have a reasonably stable temperature of between -10 and 50 °C;
- Have a relative humidity degree between 20 % and 90 % (non condensing);
- Are free of dust, corrosive gases and high concentrations of organic vapours.

2.1 GENERAL SAFETY RULES

- Only authorised persons may carry out work with the LIQUID FLAME SYSTEM.
- Do not use the LIQUID FLAME SYSTEM if there are people or animals in the direct output.
- Do not use the LIQUID FLAME SYSTEM if alterations have been made other than by or on behalf of MAGICFX®.
- Make sure that children, unauthorised people and animals do not obtain access to the LIQUID FLAME SYSTEM.
- Make sure there are no freestanding objects or objects that can be damaged by the system within the output distance.
- Do not connect more units to a single electrical circuit than the installed fuse is able to handle. (Calculate the summed load with the electrical data from Chapter 1)
- Do not remove any safeguards, safety caps and safety symbols.
- All required safety devices must be in good condition and function properly.
- Ensure sufficient lighting of the surroundings.
- Keep the workplace clean.

2.2 INDOOR/OUTDOOR USE

The LIQUID FLAME SYSTEM is designed for outdoor use or use in large well-ventilated indoor spaces. Keep the prescribed output zone clear for safe release of the flames and their heat. For specific safety requirements, refer to the corresponding user and installation manual(s) of the used flame head(s).

WARNING

Do not use the LIQUID FLAME SYSTEM in poor ventilated confined spaces. Exposure to accumulated heat and combustion fumes may cause inhalation of hazardous particles and gases, and cause eye and skin irritation.

2.3 RIGGING

NOTICE

Make sure that fuel hoses and cable runs are well supported, and are clear from obstructions and sharp edges. Always support hanging hoses with strain reliefs. Avoid hard bends and kinks. Failure to do so, could result in damaged hoses and cables.

NOTICE

Make sure that fuel connections do not carry the weight of the connected fuel hoses. Failure to do so, could result in leaking or damaged fuel connections.

Please follow the European and national guidelines for safe rigging and trussing.

2.4 SAFETY SYMBOLS

Symbol	Meaning	Position
	Read the manual carefully before use!	Front of the machine.
	Warning: Flammable Fluid. There's flammable fluid inside the 100L tank, the internal machine pipework, the connection hoses and projected from the flame outlet.	Front of the machine.
	Warning: High Pressure. There's high pressure liquid inside the internal machine pipework, the connection hoses and projected from the flame outlet.	Front of the machine.
	Warning: High Voltage. There's high voltage on the ignition probes in the flame head nozzle during operation.	Top of each flame head, near the flame outlet.

Safety symbols

2.5 SAFETY PRECAUTIONS

CAUTION

Make sure that supporting surface for the PUMP STATION is level, solid, and that it can support the weight of a fully fueled PUMP STATION (278.5 kg). If the PUMP STATION is not installed in level position, fuel may leak from the air vent.

⚠ CAUTION

Make sure that the installed PUMP STATION is safely accessible for operators that need to perform operational tasks, such as refilling.

⚠ WARNING

Using a damaged or an improper installed system component can lead to death, serious injury or property damage. Always inspect the complete system thoroughly before operation.

⚠ WARNING

Eye contact with fuel under pressure or burning fuel from the machine can lead to serious eye injury. Always wear safety goggles when you enter the safety zone.

⚠ WARNING

The LIQUID FLAME SYSTEM works with pressurized fuel. Make sure that the fuel pressure is fully dissipated before connecting or disconnecting hoses. Always wear safety goggles and suitable gloves when you connect or disconnect hoses.

⚠ WARNING

Fuels are highly flammable and must be handled with caution and in accordance with local health and safety regulations. Always follow the safety instructions of your fuel supplier.

⚠ WARNING

Never allow smoking, flames, or other sources of ignition near the PUMP STATION and other fuel storage (even when the system is turned off or in transit).

⚠ WARNING

Always create a safety zone with a distance of >1m around the PUMP STATION.

⚠ WARNING

Always create a safety zone around each flame head and make sure that the prescribed output zone is kept clear. For specific safety requirements regarding the flame head(s), refer to the corresponding user and installation manual(s), see Section Other documentation on page 5.

⚠ WARNING

Missing or obscured safety symbols can lead to death or serious injury. Make sure all safety symbols are correctly in place, see Section 2.4.

⚠ WARNING

Make sure there are no objects near the flame heads and within their output distance that can be damaged or catch fire by the emitted flames and fuel.

⚠ WARNING

Make sure there are no substances or gasses present that can be ignited by the emitted flames from the LIQUID FLAME SYSTEM.

⚠ CAUTION

Any material that blocks the output nozzle of a flame head can result in injuries, fire and damage when the LIQUID FLAME SYSTEM is used. Always inspect the nozzle before operating and remove any obstructing material.

⚠ CAUTION

The LIQUID FLAME SYSTEM should not be used in winds exceeding 20 mph or 32 km/h.

⚠ WARNING

Stop operating the system if any fire occurs outside of normal operation and/or if anything other than the emitted fuel for the SFX catches fire. Extinguish any remaining fire immediately with sand, carbon dioxide, dry powder or any other suitable extinguishing media. Do not use a water jet. Refer to the safety data sheet from the used fuel for detailed safety instructions.

⚠ CAUTION

Parts of the flame head heat up during operation and can cause burns when touched. Do not touch any metal parts of a (recently) triggered flame head.

⚠ CAUTION

Only open the inspection cover of the PUMP STATION when the system is not powered and cooled down.

NOTICE

Always keep the PUMP STATION and the flame heads dry and do not let excessive amounts of liquids such as rain or snow wet them.

3 INSTALLATION AND USE

⚠ WARNING

Eye contact with fuel under pressure or burning fuel from the machine can lead to serious eye injury. Always wear safety goggles when you enter the safety zone.

3.1 INSTALL THE SYSTEM

1. Bring the cased PUMP STATION to the desired location.
2. Confirm that the PUMP STATION is level and set the brakes.
3. Unlock and remove the top cover and the back cover.
4. Make sure that the drain handle is in the closed position.
5. Install the flame head(s) at the desired location(s). For instructions, refer to the corresponding user and installation manual(s) of the used flame head(s).
6. Take the necessary safety precautions, see Section 2.5. This includes creating safety zones around the PUMP STATION and the flame heads, and making sure that the output from the flame heads will be free from persons, animals, and property.

NOTICE

For specific safety requirements regarding the flame head(s), refer to the corresponding user and installation manual(s), see Section Other documentation on page 5.

8. Clean all liquid fuel connections with a soft rag and a small quantity of isopropyl alcohol.

3.2 CONNECT THE SYSTEM

1. Make sure that the power switch is disabled.
2. Install the ARM CONTROLLER in compliance with the instructions from the ARM CONTROLLER User and Installation Manual (PART01882).
3. Connect the PowerCon power cable to the 32A power input of the PUMP STATION. Connect the other end to a 220-250 Vac (50-60 Hz) power source.
4. Connect the correct cables between the ARM CONTROLLER, the PUMP STATION, the flame head(s) the control equipment, and other ARM SYSTEM components and machines (if applicable). Refer to the example schemes on page 7.
5. Connect the fuel hose(s) between the PUMP STATION output(s) and the flame head(s) and/or flame head manifold(s).
6. Enable the power switch.
7. Check if all the flame heads are turning on.
8. Use the display and buttons or a RDM controller to assign DMX addresses, see Chapter 2.

For more ARM connection and configuration options, refer to the ARM SYSTEM Configuration Manual (PART02323).

⚠ WARNING

The LIQUID FLAME SYSTEM works with pressurized fuel. Make sure that the fuel pressure is fully dissipated before connecting or disconnecting hoses. Always wear safety goggles and suitable gloves when you connect or disconnect hoses.

⚠ CAUTION

Make sure that hoses and cable runs are clear from obstructions and sharp edges.

⚠ CAUTION

Do not connect more units to a single electrical circuit than the installed fuse is able to handle. (Calculate the summed load with the electrical data from Chapter 1)

NOTICE

Insert a TERMINATOR in the last ARM output of each line to close the safety circuit. The ARM SYSTEM will not work when a line remains open.

NOTICE

Always plug in a DMX Terminator into the DMX output of the final unit in the control sequence. Using a DMX Terminator improves signal and reliability.

3.3 ASSIGNING DMX ADDRESSES TO FLAME HEADS

When the system is not armed, the pump will automatically scan for connected heads. All found heads will be added to the existing menu in the format XXXXX HEADTYPE ADDR. In the place of XXXXX will be the serial number. Where HEADTYPE is, the display will say HELLFIRE or FLAMEBLAZER. ADDR will display the chosen DMX start address.

When selecting a head, the FX LED will light up so you can check if the right head is selected. The menu contains two options to sort the heads:

- Sort by DMX/Serial: With sort by DMX, the heads will be listed by DMX start address, followed by serial number. With sort by Serial number, the heads will be listed by Serial number. The heads will also be grouped by head type.
- Sequential addresses: when this function is active, the start addresses of previous and following heads will be programmed in order. For example: if head 2 is set to address 10, head 1 will be assigned address 9 and head 3 will be assigned address 11.

NOTICE

All heads connected to a single pump station will have the same enable address. The start address can be adjusted per head.

3.4 INSTALL AN EXTERNAL FILLING PUMP (OPTIONAL)

⚠ WARNING

Always make sure that the machine is disarmed and not enabled (FX LED indicator on the machine is off) when you approach the PUMP STATION.

⚠ WARNING

The LIQUID FLAME SYSTEM works with pressurized fuel. Make sure that the fuel pressure is fully dissipated before connecting or disconnecting hoses. Always wear safety goggles and suitable gloves when you connect or disconnect hoses.

⚠ CAUTION

Make sure that hoses and cable runs are clear from obstructions and sharp edges.

1. Install the external filling pump and a fuel tank in compliance with the instructions from the accompanying manual.
 2. Connect the control and power cable to the External Pump connector. Connect the other end to the External filling pump.
 3. Connect a fuel hose to the Fuel Fill connection of the PUMP STATION. Connect the other end to the fuel connection of the External filling pump.
 4. Power the machine with the power switch on the front of the PUMP STATION. If the external pump is connected, the LED of the external pump will turn white.
 5. Press and hold the External Pump button on the pump to draw fuel from the fuel tank and fill the internal tank of the PUMP STATION. Or press the External Pump button on the pump once briefly to set the External Pump to automatically (re)fill the tank.
-

NOTICE

When automatic filling is turned on, the LED will flash red. During automatic filling, the tank will be filled to a maximum of 80% to prevent overflow. The external pump will start filling once the tank level is below 40%.

3.5 (RE)FILL WITH FUEL MANUALLY

⚠ WARNING

Always make sure that the machine is disarmed and not enabled (FX LED indicator on the machine is off) when you approach the PUMP STATION.

⚠ WARNING

Fuels are highly flammable and must be handled with caution and in accordance with local health and safety regulations. Always follow the safety instructions of your fuel supplier.

⚠ WARNING

The LIQUID FLAME SYSTEM works with pressurized fuel. Make sure that the fuel pressure is fully dissipated before connecting or disconnecting hoses. Always wear safety goggles and suitable gloves when you connect or disconnect hoses.

1. Switch off the power with the power switch on the front of the PUMP STATION.
2. Open the hinged fuel lid on top of the PUMP SYSTEM.
3. Release and remove the fuel cap.
4. Place a funnel in the fuel inlet.
5. Fill the internal tank with fuel until it reaches the desired level on the fuel gauge.
6. Remove the funnel, replace the fuel cap, and close the fuel lid.

3.6 FIRE WITH DMX

⚠ WARNING

The LIQUID FLAME SYSTEM works with pressurized fuel. Do not disconnect hoses when the system is armed and pressurized.

⚠ CAUTION

Wind can influence the effect and cause flames and fuel to divert off vertical.

1. Power the machine with the power switch on the front of the PUMP STATION.
 2. Make sure that the prescribed safety zones are clear and that the output zone of each flame head is clear.
 3. Set the safety key on the ARM CONTROLLER in the ON position. The pump is activated and pressurizes the system. The FX LED indicators on the PUMP STATION and the connected flame head(s) lights in red, indicating the system is now armed and the LIQUID FLAME SYSTEM and other connected SFX machines are ready to be operated.
 4. Activate the DMX enable address. The FX LED indicators on the PUMP STATION and the connected flame head(s) will flash.
 5. When it's time to flame, set the DMX value for **Effect trigger** between 200 and 255.
 6. Set the DMX value for **Effect trigger** between 0 and 199 if you want to stop firing.
 7. Set the safety key in the OFF position to disarm the ARM SYSTEM and disable operation of the LIQUID FLAME SYSTEM and other connected SFX machines. The fuel pressure in the LIQUID FLAME SYSTEM will safely dissipate within a few seconds.
-

NOTICE

The maximum continuous duration of the effect is 5 seconds. After this period the effect will stop automatically. To start the effect again you must disable and re-enable the **Effect trigger**.

3.7 USE THE EMERGENCY STOP

1. When an emergency occurs or is about to occur with the LIQUID FLAME SYSTEM, you press the emergency stop button on the ARM CONTROLLER or on an external E-STOP (if present). As a result the fuel pressure is released and the flame heads are disabled. Thereby, any related hazard/or property damage is stopped and prevented.
2. Set the safety key on the ARM CONTROLLER to the OFF position.
3. Resolve the emergency situation and inspect the LIQUID FLAME SYSTEM.
4. Release the emergency stop and perform a reset. For instructions, refer to the ARM CONTROLLER User and Installation Manual (PART01882).
5. Set the enable and effect channel back to 0.

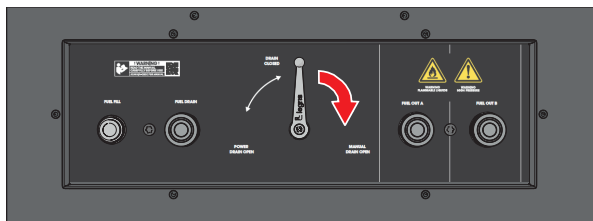
3.8 DRAINING THE SYSTEM

NOTICE

The PUMP STATION fuel tank can be drained of fuel in 2 ways, either Manual Drain or Power Drain. Power Drain is quicker but requires the system to be connected to power to drain the onboard fuel tank.

MANUAL DRAIN

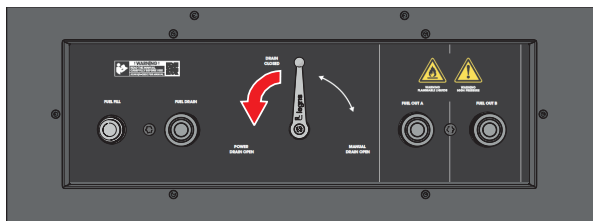
1. Connect a drain hose to the drain output.



2. Move the fuel drain valve to the manual drain position.
3. Direct the flow of the liquid into a suitable container.
4. Close the fuel drain valve when finished.
5. Disconnect the drain hose.

POWER DRAIN

1. Connect a drain hose to the drain output.
2. Ensure the system is powered on.



3. Move the fuel drain valve to the power drain position.
4. Press and hold the fuel drain button.
5. Direct the flow of liquid into a suitable container.
6. Let go of the fuel drain button when finished.
7. Close the fuel drain output.
8. Disconnect the Fuel Drain hose.

⚠ WARNING

Fuels are highly flammable and must be handled with caution and in accordance with local health and safety regulations. Always follow the safety instructions from the fuel packaging when handling and working with the fuel.

4 TROUBLESHOOTING

Code	Meaning	Solution
018	Pressure low	• Make sure the fuel can is not empty. • Check the hoses. • Make sure the pump is working. • Reset and re-arm the system. • If the problem is not solved, contact MAGIC FX.
100	Conflict in DMX addresses	• Change either the safety or the functional DMX address.
121	Head orientation out of bounds	• Reposition the head or (re)lock the heads tilt position via the pump station.
122	Modbus communication has failed	• Reboot the system. • If the problem is not solved, contact MAGIC FX.
125	Modbus response not as expected.	• Reboot the system. • If the problem is not solved, contact MAGIC FX.
201	Problem with RDM discovery	• Reboot all connected in-line RDM devices.
204	Pressure is too high	• Disarm the system or fire the effect to relieve pressure.
206	Pressure does not rise	• Check the hoses. • Make sure the pump is working. • Reset and re-arm the system. • If the problem is not solved, contact MAGIC FX.
207	Low fuel level	• Fuel the system.
209	Head connection failed while armed	• Disarm the system to perform a discovery to clear the warning. • Reboot the head. • Check all the cables. • If the problem is not solved, contact MAGIC FX.

Always contact MAGIC FX if any malfunctions or errors occur that cannot be solved with the instructions as described in this manual.

5 MAINTENANCE

To achieve the maximum service life of the LIQUID FLAME SYSTEM you must regularly clean the LIQUID FLAME SYSTEM and test if it is functioning correctly.

Before conducting any maintenance ensure the machine is switched off and disconnected from a power source and the machine is not hot from recently being used. Always use personal protective equipment such as safety glasses and gloves when handling fuels.

Maintenance task	Activity
DAILY	Check if the safety systems are functioning correctly.
MONTHLY	Remove dust and deposits from connectors and surfaces. Check all parts of distribution manifolds for leaks and degradation.

Contact MAGIC FX if the LIQUID FLAME SYSTEM is not functioning correctly.

Firmware updates can add additional features and bug fixes. Regularly check on the website or with your MAGIC FX account manager to ensure you have the latest version.

DANGER

Do not replace parts yourself; always consult MAGIC FX if necessary.

6 CORRECT DISPOSAL



This symbol on the product and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product to designated collection points where it will be accepted free of charge. Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product. Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

7 EC DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY

According to Annex III A Machinery Directive 2006/42/EC

MAGIC FX B.V. declares as manufacturer and composer of the technical construction file that the product with the following specifications:

Name machine	: LIQUID FLAME PUMP STATION
Type	: MFX1420
Voltage	: 220-250Vac 50/60Hz
Serial number	: on product
Year of construction	: on product

Is in conformity with the minimal safety regulations as stated in the following directive(s):

- LVD (2014/35/EU) Low Voltage Directive
- EMC (2014/30/EC) ElectroMagnetic Compatibility
- RoHS (2011/65/EU) Restriction of the use of certain Hazardous Substances
- WEEE (2012/19/EU) Waste Electrical & Electronic Equipment

The following harmonized standards were applied:

- NEN-EN-ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction.
- NEN-EN-IEC 60204-1:2006, Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
- NEN-EN-IEC 61000-6-3:2007/A1:2011, Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.

☐ Original declaration of conformity

☒ Translation of the original declaration of conformity

Name manufacturer	: MAGIC FX B.V.
Address	: Schouwrooij 27, 5281 RE BOXTEL
Country	: The Netherlands
CEO	: B. Veroude
Date	: 17-5-2023

Signature :



MAG:CFX[®]

WWW.MAGICFX.EU

