

FLAME SIMULATOR

Installation and Operation Manual



**KEEP THIS MANUAL IN A SAFE PLACE
FOR FUTURE REFERENCE**

READ THIS MANUAL BEFORE USING THIS PRODUCT.

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1.0 Important Safety Information



Read All Instructions before Using Equipment



The instructions provided in this manual have been prepared to serve as a general guide. It is intended for use by qualified personnel with knowledge of equipment of this type. It is not intended to cover all possible variations in equipment or to provide for specific operating problems which may arise.

You are responsible for adhering to all warnings or cautions provided in this Manual.

In addition to any general safety measures provided in this Manual, you must comply with all current national, state, local and company safety regulations at all times.

Safety Symbols used in this manual comply with ISO 3864.

THESE SYMBOLS ARE USED TO ALERT YOU TO POTENTIAL PERSONAL INJURY HAZARDS.

OBEY ALL SAFETY MESSAGES THAT FOLLOW THESE SYMBOLS TO AVOID POSSIBLE INJURY OR DEATH.



Indicates a hazard with a high level of risk which, if not avoided will result in death or serious injury.



Indicates a hazard with a medium level of risk which, if not avoided could result in death or serious injury.



Indicates a hazard with a low level of risk which, if not avoided will result in minor or moderate injury.



RADIATION HAZARD

Do not stare into UV beam. Long-term exposure to the high energy light source will cause damage to eyesight or even permanent loss of vision. Equipment must be installed and calibrated by qualified personnel in accordance with applicable local and national codes, standards, and ordinances.

2.0 Definitions

iScan – The iScan is an optical flame detector designed for detecting burner flames of fossil fuels such as natural gas, refinery gas, waste gas, fuel oils, and coals.

Flame Simulator – This product was designed to work with iScan flame detectors. It is an electronic device which simulates flame signals by flashing UV LED.

3.0 Chentronics Flame Safety Systems

iScan Flame Scanners monitor burner status by providing real time flame spectrum analysis. The iScan device reads the simulated flame signal and is analyzed by the iScan software, and these signals are analyzed by iScan software remotely.

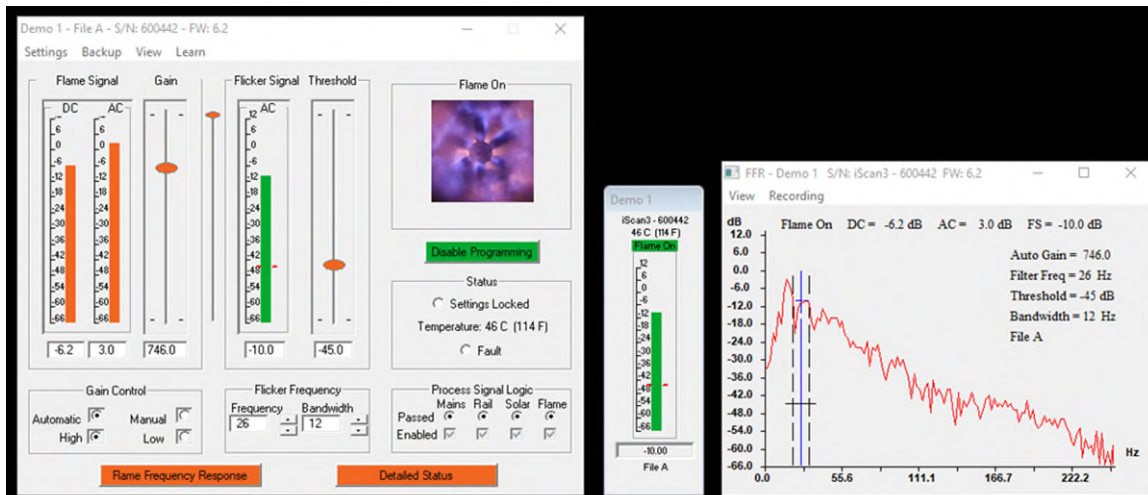


Figure 1: DSFCOMM software interface.

iScan Flame Scanners can be fully functional tested using the Flame Simulator.

4.0 System Specifications

4.1 Description of Equipment

The Flame Simulator produces an electronic representation of flame signals. It does not produce any actual flame. The equipment is a rechargeable, portable device, which includes an internal 7.2V NiMh battery. The flame simulator includes an AC power adapter with EURO, UK and AUS converters, which can be used to charge the internal battery. At the output, the 1" NPT nipple threads into the scanner. Finally, the Flame Simulator has a Tri-Color LED which indicates the power status, an LCD with backlight operation to show the mode information and battery information, and a rotary encoder to switch between Flame On/Background mode.

4.2 Factory Settings

Four sets of data are preloaded into the simulator: Each signal set contains 1 - 30 seconds of flame information (run in a continuous loop), which is used to represent the flame signal.

4.3 General Arrangement

The 1" NPT nipple on the end of the simulator threads into the scanner as shown below.



Figure 2: Flame Simulator attachment to iScan2 Flame Scanner.

When charging, connect the plug on the power adapter to the power jack on the simulator.



Figure 3: AC Power adapter for flame simulator.

4.4 Description of Equipment Enclosure

The equipment is sealed in an enclosure with an IP55 rating.

4.5 Equipment Conditions of Use

The Flame Simulator is subject to the following conditions of use and limitations:

1. The operating temperature range is -20°C to +60°C (LCD response time is slower when temperature less than -20°C).
2. The unit is not field-repairable. If there are any issues with the device, please contact Chentronics for technical support.

3. The internal battery should only be charged with the provided AC power adapter.
4. Ensure that all connections are tight before using the equipment.

4.6 Flame Simulator Electrical and Physical Specifications

Application:	For use with iScan flame scanners only
Input Power for AC adapter:	100-240VAC 50/60Hz, 1A MAX
Input Power for Flame Simulator:	9V DC, 0.5A MAX
Operating Ambient Temperature:	-20°C to 60°C
Storage Ambient Temperature:	-25°C to 60°C
Humidity:	0 to 100% condensing
Enclosure:	Extruded aluminum enclosure with die-cast panels
Weight:	1.25lbs (0.567 kg)
Dimensions:	2.59 x 2.59 x 4.33in

5.0 System Operational Inputs and Outputs

5.1 Rotary Switch

The rotary switch is located at the end of the enclosure and includes both rotary and push-button functionality. The push button allows the user to toggle power. After plugging AC adapter wait for Power LED to turn on. If the battery is low, the Flame Simulator will not boot up. In this condition, the power LED will flash red for 4 seconds, indicating that the battery is in Critically low. Rotating the nob alternates between the different user modes.



Figure 5: Rotary switch and power LED.

5.2 Power LED

The power LED is located Adjacent to the rotary switch. When the simulator is operating on battery and the battery is fully charged, the LED is on solid green. Solid red LED indicates low battery power. When the battery is critically low, the unit will power down, and attempting to power on the simulator will cause the LED to flash red. When the DC adapter is connected and the battery is charging, the LED flashes green. Once its fully charged, the LED returns to solid green.

Table1: Power LED function description.

OPERATION CONDITION	BATTERY STATUS	LED BEHAVIOR
Power off, DC Adapter unplugged	None	All LEDs off
DC Adapter Connected	Charging	Green LED flashing
	Fully Charged	Green LED solid
Power on, DC Adapter unplugged	Above Low Level	Green LED constant on
	Between Low and Critical Level	Red LED constant on
	Below Critical	Red LED flashes for 4 seconds, and then goes off.

5.3 LCD Display

The LCD displays different flame simulation modes. These different modes can be switched through by rotating knob.



Figure 6: LCD Display.

6.0 Scanner Functional Testing



 **DANGER**

EXPLOSION HAZARD



Functional testing of the Flame Simulator should ONLY be done on a test bench. DO NOT connect to a burner control system. Falsely indicating a flame with a burner control system can create a hazard with a high level of risk which, if not avoided will result in death or serious injury.

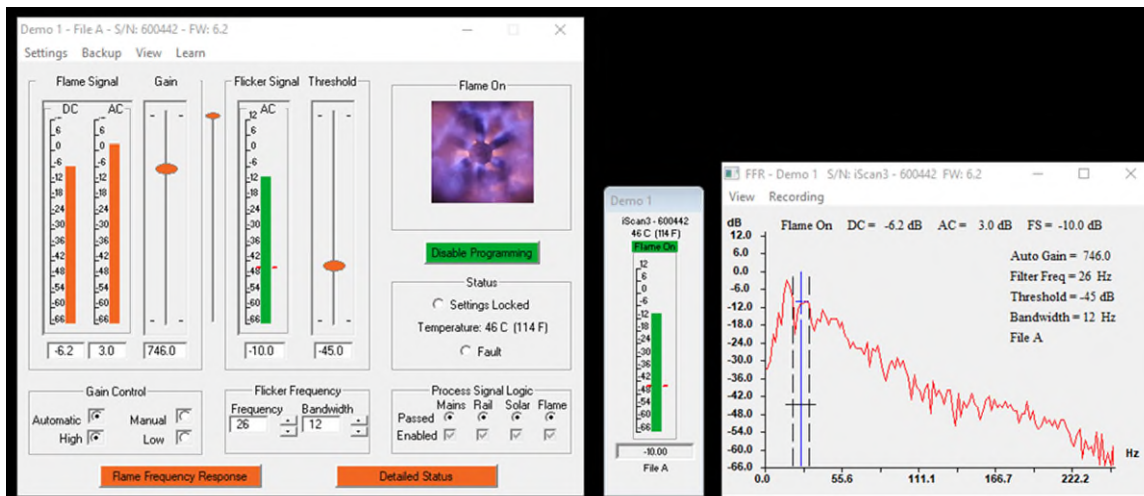
When testing the iScan-SB there is nothing to set in the scanner. For the iScan-MB set to the following settings, via the iScan Software:

- Flame Frequency 26 Hz
- Bandwidth 12 HZ
- Gain Auto (High)
- Threshold -45

6.1 Flame ON Test

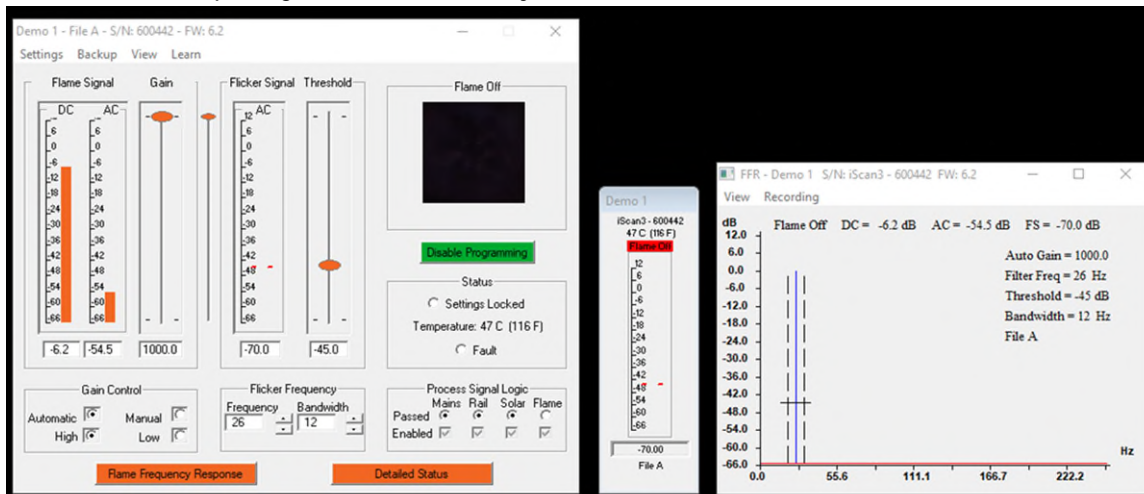
Push the rotary button to turn on the simulator.

To test flame relay operation and the 4/20mA in the iScan scanner, connect an ohm meter between #9 (red) & #0 (black) wires on the scanner cable and another meter to read flame signal milliamps between #5 (blue) & #7 (white) on the scanner cable. Use the rotary switch to select "GAS TRANSLUCENT FLAME ON" or "OILS/COAL BRIGHT FLAME ON". The only difference between Gas or Oil/Coal is the brightness of the UV LED. The flame relay should CLOSE i.e. ohm meter will indicate short between #9 (red) & #0 (black) wires on the scanner cable. The 4/20 mA output should be reading between 7.5-20 mA range.



6.2 Flame OFF Test

Push and hold the rotary button until the display turns off. The flame relay should OPEN i.e.e ohm meter will indicate open circuit between #9 (red) & #0 (black) wires on the scanner cable. The 4/20 mA output signal should be nearly 4mA.



6.3 Flame Profiles

There are a total of eight different flame signal profiles pre-loaded in the simulator. These are used to demonstrate how iScan flame scanners differentiate target flame versus background flames. Below is a list of these modes.

The following five modes are to be used with the iScan directly connected to the FlamSim.



The following three modes are to be used when connected to a fiber-optic extension.



7.0 Maintenance

7.1 Service

The unit is not field-repairable. Please contact Chentronics for technical questions.

NOTICE: Incorrect connections can result in damage to equipment.

7.2 Cleaning

7.2.1 **UV LED and LCD** – Use soft cloth and minimal pressure.

8.0 Standard Components and Accessories

The following is a sample of standard parts available for use with the flame simulator. For additional parts and technical drawings please contact Chentronics.

8.1 9V DC Adapter

NOTE: Replacement can be ordered. Reference part number 04005714

9.0 Warranty and Technical Support

For warranty and technical support related inquires beyond the scope of this Installation and Operation Manual, related inquires please contact Chentronics.

10.0 Drawing 04005700

