USER MANUAL

1. Host Controller (ZK6200)

1) Description of Hardware

1. ZK6200 Host Controller is an intelligent system specially designed for the multi-effects and remote control of Sparkular machine, so as to create the simulation and demonstration of Pyrotechnic Gerb effects. Diversified port configuration is suitable for control of technical performances. The audio trigger and timing code trigger can be used to control the synchronous function of music. LAN port is installed for future control extension.

Host Controller	Part No.: ZK6200
	Parameters:
	Dimension: 390 x 300 x 110mm
	Weight: 3.5kg
	Input: 110-240Vac, 50/60Hz
	Work power: 15w
	Work Temp.：-10 ~50
	Ports: 2 CAN communication ports, USB port, 2 media ports (music trigger), 2 MIDI ports (music trigger), 2 DMX512, 1 input & 1 output port, Ethernet (not currently available-for future application)
	Support max.200m communication cable
	3350mAH battery
	Lifetime: > 3 years

2) Host Controller Introduction – Standard or Pro Version

a) International standard DMX512 signal output

b) Support 18 units Sparkular at the same time (Standard = 18 units / Pro Controller = 54 units).

c) Five kinds of standard Dynamic modes: Synchronization (All Fire), Center to Ends, Ends to Center, Left to right，Right To Left, Special Effects and one kind of user-defined special effect mode, supports 8 files and each file supports 36000 lines at maximum (special effects last for 30 minutes)

d) There are multiple optional trigger sources. Hand, Music or Midi Inputs.

e) Support simulation function and LED display.

f) Monitoring function: System can pass back operation that shows on screen status of each Sparkular unit by (Temperature and Error messages these will display in F1 Mode on screen)

g) Emergency Function: Pause or Stop Button. (Earlier panel version have Pause buttons)

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Page **1** of **18**

3) Controller Operation Panel

Controller Operation Panel

a) Cable Connection Area:

AC Input: AC Power Input.

CAN: CAN Communication Input / Output Ports.

Tape In: Audio Signal Input Port of Main Channel

Aux: Audio Signal Socket of Side Channel.

Music: Displaying the Electrical Level of Audio Signal.

MIDI In: Time Synchronous Signal Input of MIDI & thru output.

DMX 512: DMX Signal Options (top) Output (bottom) Input for DMX console control.

LAN: Network's Cascade Socket among Multi-Chassis, so as to link the remote control feature.

Download: SparkularEdit200 soft Port

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Page **2** of **18**

b) Manual Operation Area

No.1 to No.18 is Sparkular number.

Start or Stop Sparkular of one channel by pressing No. 1 to18 keys. The Sparkular can be operated after the Pre-Heat warm up for 3-5 minutes. The indicator light will flash green while heating up when ready it will be solid green. When firing is activated the indicator light will illuminate Red. Firing will occur when the Fire button is initiated. The Sparkular will stop automatically after 30 seconds if not shut off.
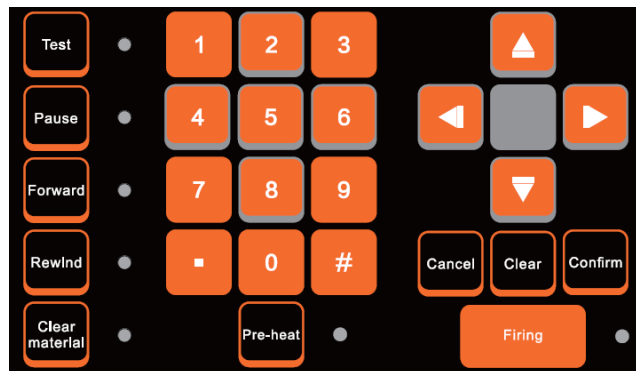
c) Mode Selection Area

There are five standard dynamic modes and one special effects mode which can be initiated by pressing the keys. These activate a pre-programmed page of functions that are displayed on each selection. They can be manually added. Manual operation will not be activated during special effects playback.

d) LCD Area

F1: Main Menu

F2: File Selection Menu

F3: Configuration Menu

F4: About Menu

e) Edit/Control Area

Moving cursor into editing area, and parameters can be programmed by pressing number keys or up/down keys.

Test --- When pressing the Test, Sparkular file will be operated and LED will display the effect, but communication won't be output. This is also for factory testing.

Pause or Stop --- Device can be forced to stop once any abnormality happens. Pre-heat also shuts off. The device should be released from the pause status by pressing fire if there are no abnormalities. This action can also be used to clear warning information. After this Pre-Heat will need to be turned back on. Please note that Original Panels have a Pause button new versions have a Stop button.

Forward --- Under the special effect mode, the operating time can be put forward.

Rewind --- Under the special effect mode, the operating time can be put backward.

Clear Material --- After device's long-distance transportation, the granules can be dislodged into the heating tube it can be cleared by pressing this key so as to have a uniform operation of the device.

Pre-heat --- Before starting-up Sparkular the pre-heat function should be turned on first and Sparkular units can be fired only when the system shows a ready (solid green light within 5 minutes). If the DMX is unplugged or communication is lost the Pre-Heat button will need to be reactivated. Leaving the pre-heat on for long durations without use will affect the life of the device. If the device will not be used for a long time, shut down the pre-heat function until needed.

Firing --- Sparkular programming file will be operated once the firing key is pressed. (Red Light) The firing can be paused or stopped and restarted by a second and third button press. This resets the cue from the top.
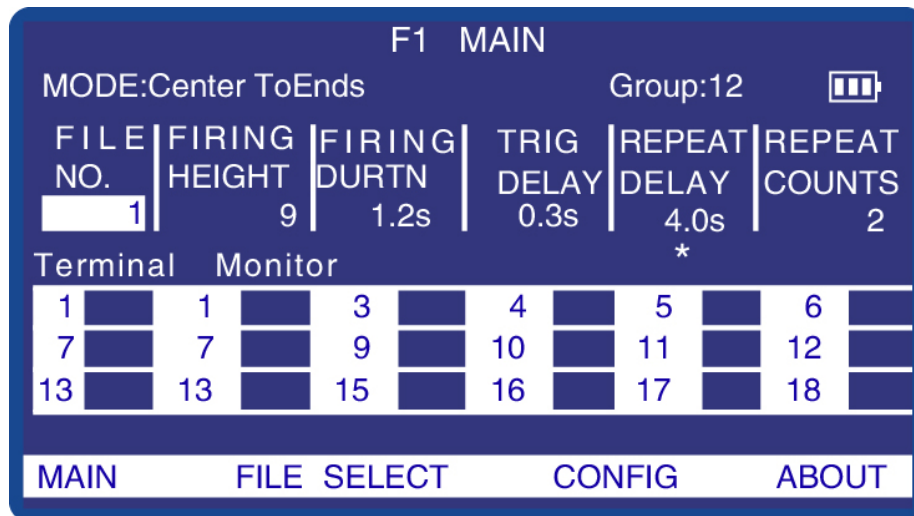
4) Interface

   a) Main Menu

MODE: Displaying the Mode **F1**
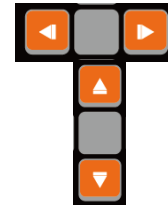
GROUP: Displaying the Total Quantity of the Devices.

Displays battery capacity and when the battery capacity is at one grid, it is necessary to recharge.

Left and right keys can make the cursor move on the different parameters.

Parameters can be edited through up/down keys and number keys and it will

Be saved automatically. The confirm key can also be initiated to save.

Option	Scope	Illustration
FILE NO.	1-8	File number
FIRING HEIGHT	1-10	Fountain Height. "." button can change height10 directly.
FIRING DURATION	0.1-30.0s	Duration of the Fountain
TRIGER DELAY	0.1-30.0s	Trigger Delay for the changes. Time between fixture firings
REPEAT PERIOD or REPEAT DELAY	0.1-30.0s	For Repeat Period the value must be greater than Duration. For Delay the Repeat timing starts at last cue.
REPEAT COUNTS	1-5	Repeated times (Loop)

*Note: Only "**Pause** or **Stop**, **forward**", "**Rewind**" button is available when "**Firing**" button lighting.*
Please take note the setting for "repeat counts".
Terminal Monitor: These are displayed in a table that is in F1 and below the play back file selected. These display the working status of Sparkular will be displayed in corresponding areas, and the number is the trigger temperature of Sparkular. There are 1-18 on the Standard Controller and 3 sets of 18 or 54 units that are displayed in rotational sequence. The standard operating temperature will be 585-620. The other warning information is as follows:

b) Error Messages List

Error Information	Illustration
E0 System IC	Systematic error
E1 Motor Protect	Over current protection of the motor
E2 Temp. Sensor	Temperature sensor is not connected or be damaged.
E3 P Temp. Over	The equipment stops due to the over-temperature of the chassis
E4 Time Remain	The Sparkular Grain materials are about to run out
E5 K Temp. Over	The equipment stops due to over-temperature of the mechanism
E6 Heating Failure	Perhaps some issues for heating system. Please power off when this error happened.

C) File Select: F2

F2 displays the parameters list of the 8 files that can be set to the height, duration, time between shots and the time until the next firing. Loops can be created and repeated up to 5 times per file in the count column. In this way you can select the needed files quickly.

F2 FILE SELECT

MODE: Synchronization

FILE No.	FURING NEIGHT	FIRING DURTN	TRIG DELAY	REPEAT DELAY	REPEAT COUNTS
1	3	5.0s	0.0s	5.0s	1
2	9	0.8s	0.0s	1.0s	1
3	3	5.0s	0.0s	7.0s	2
4	9	0.4s	0.0s	1.0s	1
5	9	0.5s	0.0s	5.0s	2
6	9	1.0s	0.0s	3.0s	3
7	9	1.0s	0.0s	2.0s	2
8	9	1.0s	0.0s	1.0s	1

D) Configuration Menu：F3

F3 CONFIG

SPARKULAR Start No.	: 1
SPARKULAR End No.	: 18
Trigger Source	: HAND
Audio Level	: 4
Audio Filter Delay	: 100ms
Audio Stop	: Firing Stop
Mode Selection	: User Mode
Language	: EngLish
Repeat Time Mode	: Repeat Delay Mode
DMX IN	: OFF
DMX Address	: 1

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Page **6** of **18**

Option	Range	Description
Sparkular Start and end number	1-18 units (standard) 1-54 units (pro)	The maximum quantity of fixture/heads being used. Unless multiple controllers are used.
Trigger Source	HAND, AUDIO, MIDI	Trigger Sources options under special effect mode
Audio Level	1,2,3,4	Voltage classes1-4 after choosing Audio Trigger Mode
Audio Filter Delay	10-100ms	The filtering time of trigger signals after choosing Audio Trigger Mode
Audio Stop	Music Control stop or continue	This function allows the console to stop the program sequence or allow it to continue without music track.
Mode Selection	User Mode, Factory Mode	Factory Mode only used for the factory test
LANGUAGE	ENGLISH/CHINESE	Can be selected for Language
REPEAT TIME MODE	Repeat period or Repeat Delay	This Changes how the Files are played back; Repeat Period – Delay Explained in End Note
DMX Input	On/Off	DMX Input allows user to control through another DMX console and disables the Showven controller.
DMX Address	1-512	This gives the first fixture a start address for operation. It does not matter what the units are set to(low to high)
LAN	Communication Port	This port is for future Communication.

5) The Use of the Special Effect Mode:

With the USB cable connected to the computer, the download can be completed through Sparkular Edit 200 soft, so you can follow the User's Guide of Sparkular Edit 200 in detail. (See Console operation manual).

Trigger Source Options; when Trigger Source is selected as HAND, the file is operated by pressing Firing the Audio Trigger is interfered easily, and it can be triggered only one time. When the audio signal appears, the AUDIO Trigger starts-up. There's audio signal light on the Music window, and Audio Level 1-4 are listed from bottom to top.

When the Audio Level 1 is selected and Audio Filter Delay is 50ms, the first light of the Music is on and lasts for 50ms once Audio appears, and the file is operated. In order to prevent the mistake trigger, when this function is used, the Trigger Source should be first set as **HAND**, and then audio signal cable is plugged to connect to the normal audio signal source, finally the **AUDIO** is selected. Proper Audio Level and Audio Filter Delay are selected according to the strength of the audio signal.

When Trigger Source is set as MIDI, the operation of the device can be started and stopped synchronously by MIDI Time Code (MTC).

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Page **7** of **18**

No matter which mode the Trigger Source is set, the operation of the device can be started and stopped synchronously by SparkularEdit200 connected computer.

Please note that there is another manual for the operation of the Sparkular Edit 200 Software. Currently the software does not stop Sparkular operation if the music feed or track is stopped or connection of playback track has been interrupted. The program would need to be paused or stopped by the operator and restarted to resume operation of the Sparkular show. (Once again the Pre-Heat function will turn off and would need to be reset to on position).

End Note: Repeat Period/Delay – Explained

The Controller is set by default in the Repeat Delay mode. This allows the files to be created with a time delay between the last fired cue and the next repeat count that is set in the file. This creates a continual loop of effects.

The Controller can be reset in the F3 file to the Repeat Period mode. When the Repeat Period mode is selected and the repeat period starts when the first cue is fired. The Repeat Period value needs to be higher than the Firing Duration (for the Synchronize mode) or the total time of the duration plus trigger delay can be used to create a wave style effect.

FILE NO.	FIRING HEIGHT	FIRING DURIN	TRIG DELAY	REPEAT PERIOD	REPEAT COUNTS
1	3	0.6s	0.2s	3.0s	5

Please note that the Sparkular units are not made to run continuously or for long periods of time. It has a maximum of 60-90 second intervals. Its standard usage is for programmed sequences for up to 90 seconds. The units will over heat and slow down or stop producing sparks. They will need to cool down prior to continuing their use. Continuous overheating will void all warranties. If clean is needed, please use a bottle brush to keep the fountain pipe free of debris.

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Page **8** of **18**