Installation and Users Guide

Updated September 2011
Software Rev. 2.0.51

Warranty Repair Location:

Lazer Frenzy
RA#: (input RA number here from tech support)
350 Bridge Street
Mooresville, IN 46158

Telephone: 317-834-4770
Email: support@lazerfrenzy.com

Table Of Contents

Warranty and Warnings

The Lazer Frenzy warranty includes all parts for a period of one year from the date of delivery. Shipment to the warranty repair location is the responsibility of the customer. The warranty location will pay for return shipment in the same manner as the item was originally shipped upon repair. Damage due to excessive abuse or acts of God are not covered. Examples of such abuse include but are not limited to:

- Cut Wires
- Liquids spilled into electronics
- Vandalism
- Use of improper chlorinated window cleaning agents on windows
- Damage caused by not properly powering down Z-Controller prior to disconnecting or adding cables to the RS485 connectors on the Z-Controller unit

Laser Safety

The Lazer Frenzy product complies with CDRH 1040.10 and CDRH 1040.11 regulations governing laser product safety.

The product uses class IIIa visible laser diode modules, 632nm red, and 532nm green.

Do not allow anyone to purposely stare into the laser beam as this could result in permanent eye damage.

FCC Compliance

TheLazer Freny product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(i.) this device may not cause harmful interference and
(ii.) this device must accept any interference received, including interference that may cause undesired operation.

Basic Operation

The Lazer Frenzy basic operation consists of turning it on, verifying payment, selecting a game, playing the game, and then printing the score sheet.

Turn on the Lazer Frenzy

To turn on the Lazer Frenzy:

- Check the fluid level in the atmosphere generator and fill if necessary. Failure to fill the unit may damage it and void your warranty.
- Check the paper level in the receipt printer. You can wait for a paper out message, if you prefer.
- Turn on the main power switch that feeds the UPS. All of the low voltage electronics necessary for operation of the Lazer Frenzy will be activated when the UPS is powered up.
- Turn on any lighting switches for the black lights in the room.
- Turn on any switches necessary for the atmosphere generator, fan, and amplified speakers.

Turn off the Lazer Frenzy

To turn off the Lazer Frenzy:

- Remove power from the UPS. This will do an automatic safe shutdown of the computer which takes approximately 1 minute after removing power to the UPS.
- Turn off any room black lights
- Turn off any switches necessary for the atmosphere generator, fan, and amplified speakers.

Play a Game

- Put in proper payment using the coin door or card swipe system.
- Select your difficulty level using the 4 colored push buttons.
- Play the game
- Pick up Score Ticket

High Score Video

When the Lazer Frenzy is not playing a game, it will replay a video taken of the player with the highest score. All games are recorded on the hard drive as they are played. If the game ends up being the high score, it is copied over to a different folder. You can clear the high scores using the "Owner Reports" menu further described on pages 34-36.

Routine Maintenance

The Lazer Frenzy needs very little maintenance beyond normal cleaning to remove finger prints and smudges, etc. The atmosphere generator, however does require regular maintenance. See the atmosphere generator instruction manual that came with this product for details.

Cleaning the Transmitter and Receiver Windows

If the transmitter or receiver windows need cleaning:

- Use only a "Windex" type of glass cleaner that does not contain any chlorinated solvents of any kind. Any chlorinated solvents will cause the windows to crack or shatter and this is not covered under warranty.
- Use a soft cloth to wipe the windows.
- Do not use a paper towel, as this will scratch the window and distort the laser.
- Do not rub excessively to avoid scratching the windows

Remove Dirt from air inlets

Dirt and dust buildup are much worse in a fogged or hazed environment. This buildup can cause early failure of computers and power supplies.

- Once every (2) months, remove dust buildup from all computer vent holes, and from the Z-Controller vent holes. Use compressed air to blow the dirt and dust out.

Changing Z-touch(push button) light bulbs

The LED light bulbs supplied with your system should last 20,000 hours. If you need to replace them, you can remove the rear of the switch assembly by turning it ¼ turn. The system is powered by 12VDC, so the bulbs use 12V or 14V lamps or LEDs.

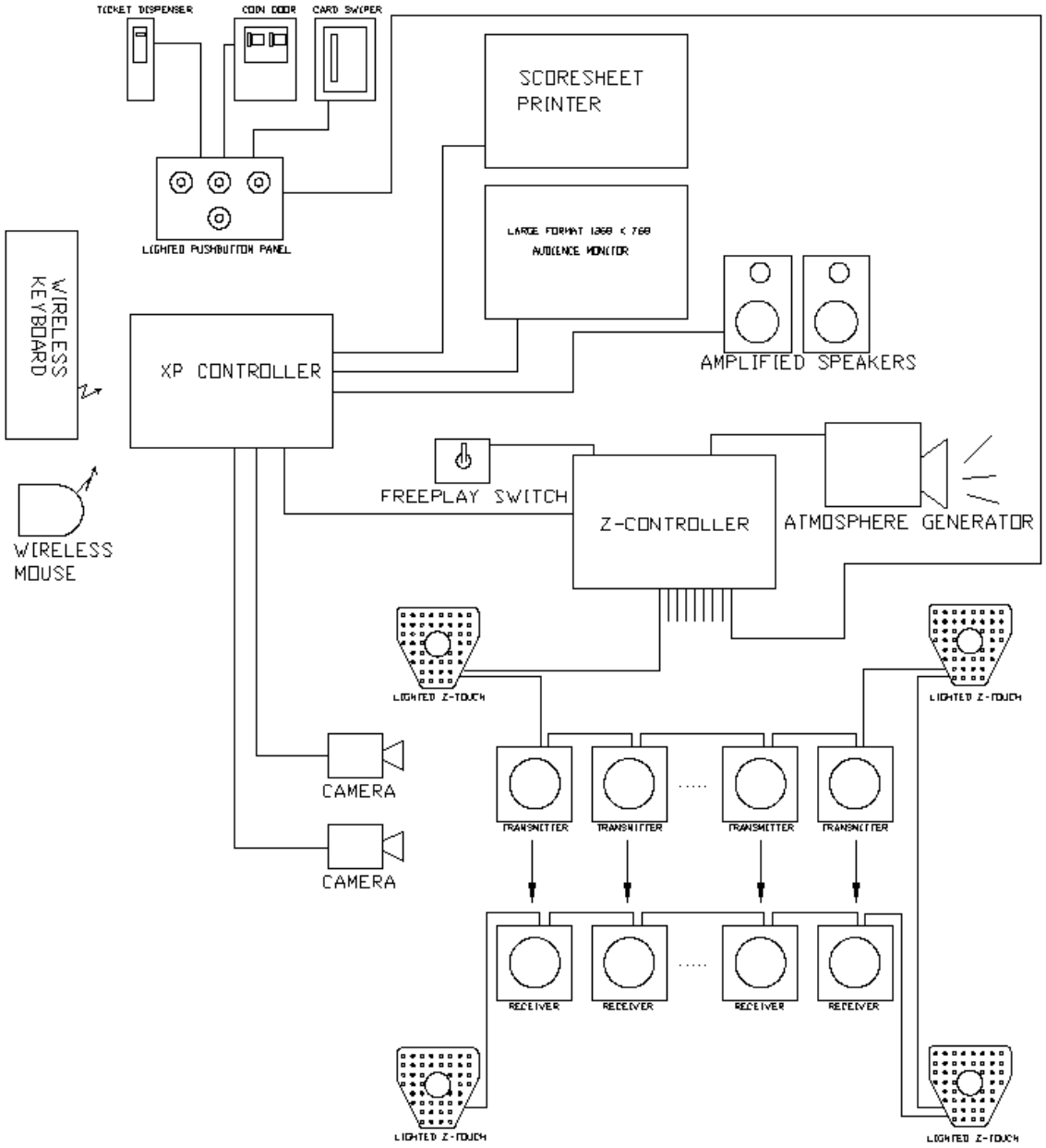
Quick Checkout of the Laser System

You can do a quick checkout to make the laser transmitters and receivers are working properly by clicking on the lower left corner of the screen, where there is a hidden "hot spot". This will bring up the System Setup menu. Select "Run System Tests" and "Test All Beams". This will power on all lasers and make sure that all of the receivers that are supposed to have a laser beam hit them are receiving properly.

If this test fails, it will indicate which beam didn't see a receiver, by highlighting it red instead of green. You can turn on just this beam and investigate the cause by then clicking on the highlighted portion of that beam's number/name. Many times the cause of a failure of this test is something or somebody left in the room that is blocking one of the laser beams.

Block Diagram

The following block diagram shows a full implementation of a Lazer Frenzy system. Your system may have different quantities of devices, or some of the devices may not be included in your configuration.



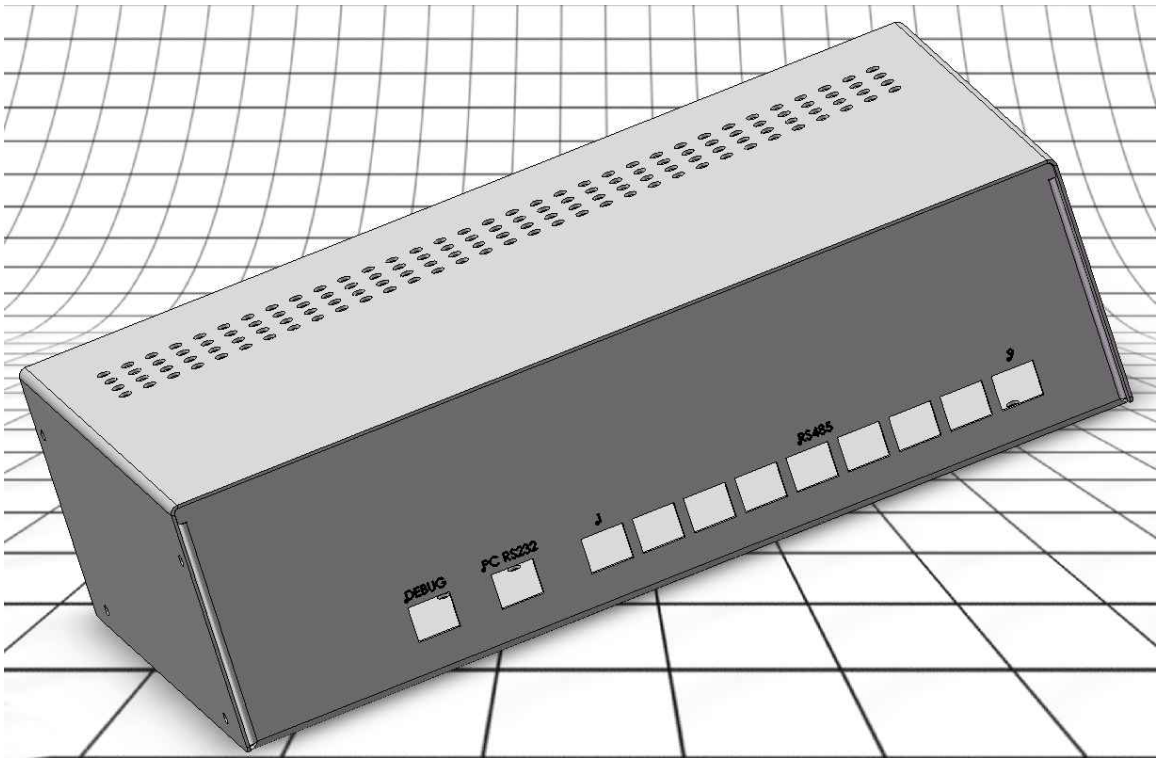
Description of Devices

This section of the manual describes the capabilities of each of the devices included in the system. It is useful when setting up the system initially and adjusting the configuration of the games during installation. Each device has at least one microprocessor that allows 2-way communication between all of the devices.

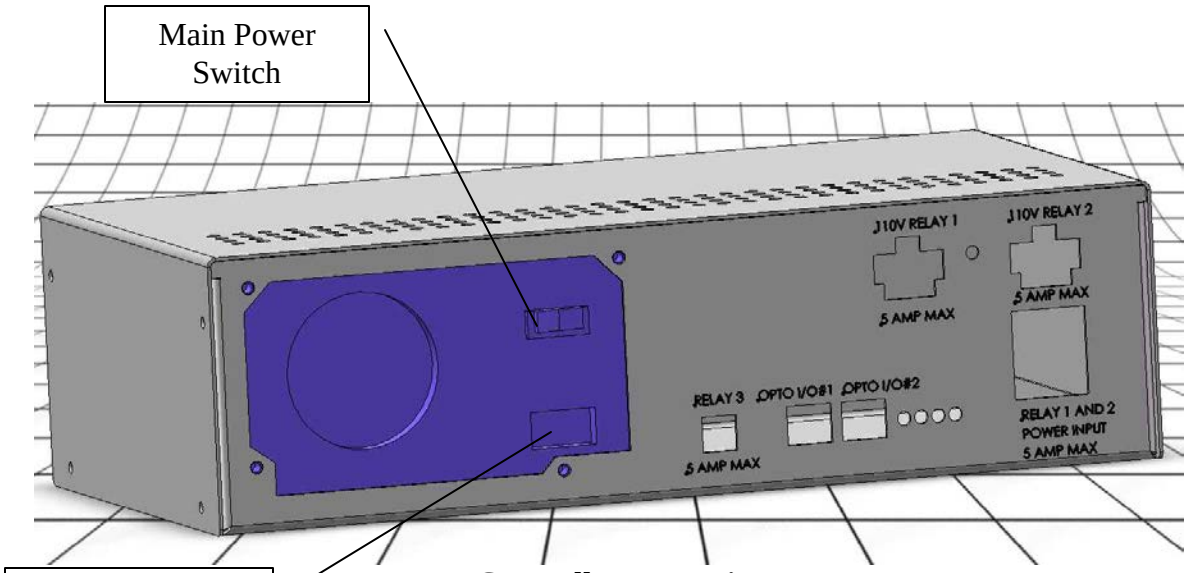
The Lazer Frenzy utilizes the following devices:

The Z-Controller:

This device is the heart of the system as it contains the power supply that runs all of the connected Laser Transmitter Modules, the Z-Controller microprocessor, as well as input and output devices for controlling additional automation and special effects. On the outside of the Z-Controller you'll find 110 volt outlets that can be turned on and off using the game software as well as a relay contact that can be used for AC or DC switching.



Z-Controller Front View



Z-Controller Rear View

Here is a list of connectors and plugs on the Z-Controller box and their purpose and use.

- **Main Power Switch**. This is used to turn the Z-Controller and any other devices connected to it on and off (except RELAY 3). It is VERY IMPORTANT to ALWAYS turn this power off whenever plugging or unplugging any device into the RS485 connectors on the front of the controller. While you may not always damage the interface chip if you don't, you will eventually destroy a device if you plug it or unplug it with the power on.
- **RELAY 1 and 2 Power Input**. This is used to provide power to the switched outlets labeled RELAY 1 and RELAY 2. This input connector has a 5 amp slo-blo fuse in it. Make sure that the combined load on RELAY 1 and RELAY 2 does not exceed 5 amps.
- **RELAY 1**. This is a switched outlet that can turn 110Volt devices on or off. Make sure that the combined load on RELAY 1 and RELAY 2 does not exceed 5 amps.
- **RELAY 2**. This is a switched outlet that can turn 110Volt devices on or off. Make sure that the combined load on RELAY 1 and RELAY 2 does not exceed 5 amps.
- **RELAY 3**. This connector gives access to the 3 contacts of a relay. The relay is rated at 5 amps, AC or DC, and 125 VAC maximum voltage. This will be used for the atmosphere generator.

Pin #	Pin Name
1	N.C.
2	Common
3	N.O.
4	No Connect

- **OPTO I/O #1** . This connector has one opto isolated input and one opto isolated output. The input can be used to read switches or signals from some other computer or controller. The output is an open collector output that can be used to communicate with some other computer or controller.

Pin #	Pin Name
1	Int. +12V
2	Int. GND
3	Output O.C.
4	Output Emitter
5	24VDC Input LED Anode
6	24VDC Input LED Cathode

OPTO I/O #1 and #2 Pinout

- **OPTO I/O #2** . This connector has one opto isolated input and one opto isolated output. The input can be used to read switches or signals from some other computer or controller. The output is an open collector output that can be used to communicate with some other computer or controller.
- **PC RS232**. This connector is used for communication between the PC and Z-Controller.
- **RS485 1 thru 9**. These 9 connectors are all connected together and contain a bidirectional RS485 data bus, as well as +12VDC power and ground lines. Each of the connectors has a self-resetting 2.5A fuse, so the installer has to choose the wiring so that the current is less than 2.5A on each of the connectors.

Pin #	Pin Name
1 & 6	Fused +12VDC
2 & 5	12VDC GROUND
3	RS485 Data -
4	RS485 Data +

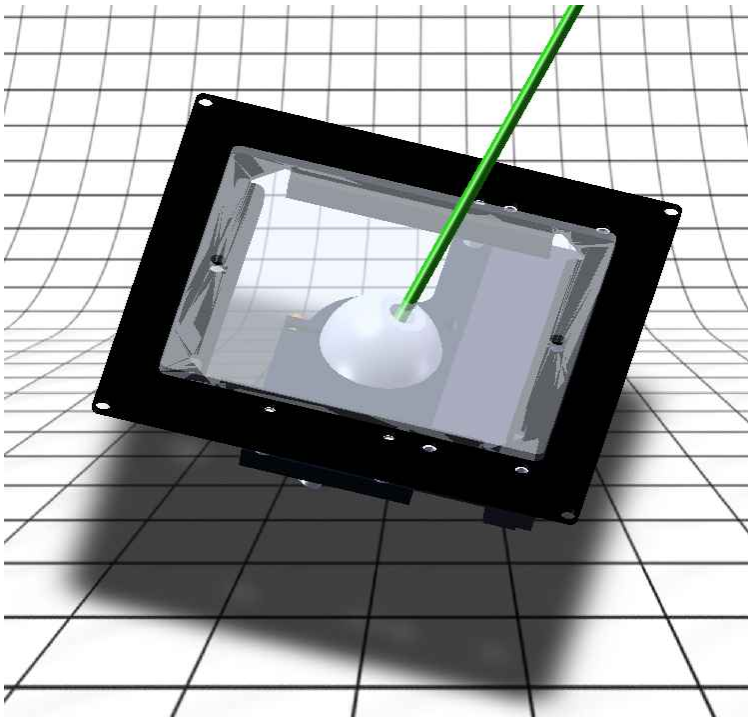
RS485 1 thru 9 Pinout

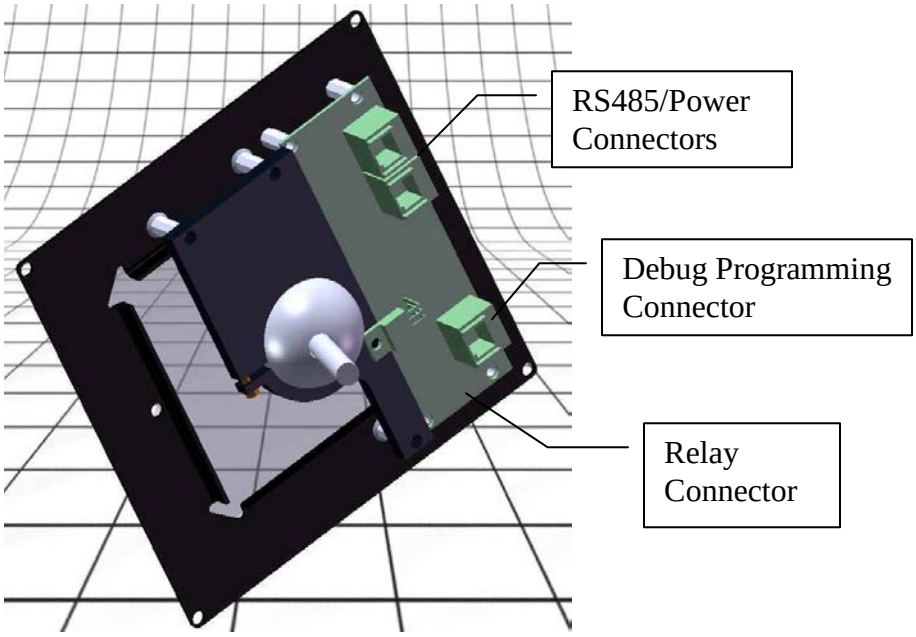
- **DEBUG**. This connector is used during manufacturing to program the controller.

The Z-Tower:

The Z-Tower gives you incredible flexibility for the installation of this attraction as well as changing locations of lasers, receivers and reflectors. Each position in the Z-Tower allows you to install a Laser Transmitter, a Receiver, a Reflector, or a cover plate.

The Laser Transmitter Module:





The Laser Transmitter module responds to commands from the Z-controller. It has the following connectors:

- **RS485/Power.** These 2 connectors are identical and are connected to each other. They receive 12Volt DC power and RS485 commands from the Z-controller. There are 2 of these connectors to allow "Daisy Chain" connections between devices connected to the Z-Controller.

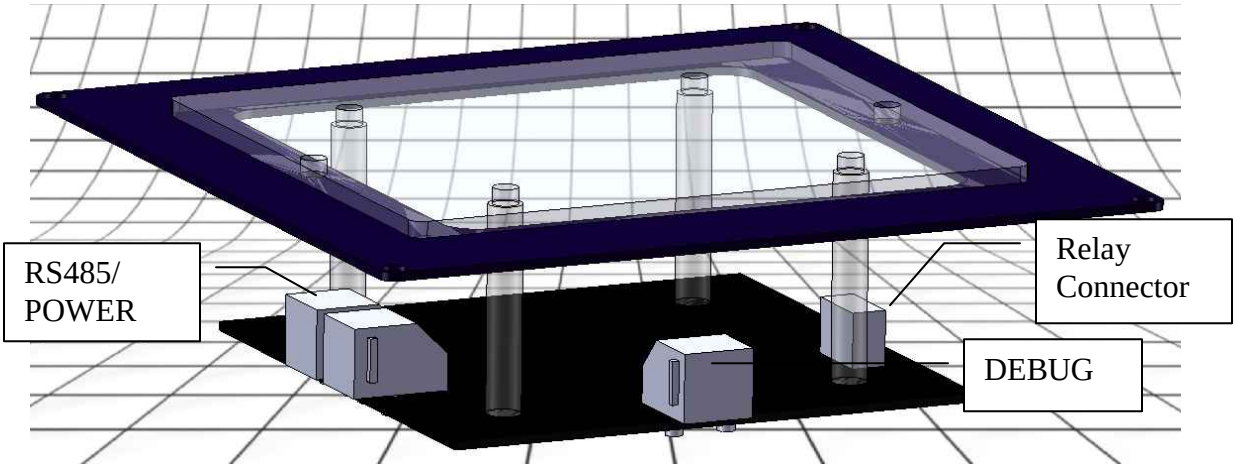
Pin #	Pin Name
1 & 6	Fused +12VDC
2 & 5	12VDC GROUND
3	RS485 Data -
4	RS485 Data +

RS485 / Power Pinout

- **DEBUG.** This connector is used during manufacturing to program the device.
- **RELAY.** This connector is used to attach a 10 pin ribbon cable to an external metal relay box.
- **LED's.** The Laser Transmitter has 5 small LED indicators on it with the following meanings:

LED COLOR	STATUS	MEANING
RED	ON	Future Use
	OFF	
BLUE	FAST FLASH	This device is waiting for a new ID#
	ON	LASER is activated
	OFF	Laser is deactivated
YELLOW	OFF	Power and Data No Good
	FLASHING	Power and Data Good
GREEN	OFF	Future Use
	ON	
ORANGE	ON	RELAY is active
	OFF	RELAY is inactive
RED/ORANGE/BLUE	FLASHING	This device has an invalid ID# and is waiting for the ID key

The Receiver Module:



The Receiver is similar in nature to the Laser Transmitter Devices but without the lasers. Its purpose is to notify the Z-Controller whenever it detects a change in the laser beam "make or break". Basically, whenever a signal is received or interrupted, the Z-Controller knows it and sends a signal back to the software to record the event. It has the following connectors:

- **RS485/Power.** These 2 connectors are identical and are connected to each other. They receive 12Volt DC power and RS485 commands from the Z-controller. There are 2 of these connectors to allow "Daisy Chain" connections between devices connected to the Z-Controller.

Pin #	Pin Name
1 & 6	Fused +12VDC
2 & 5	12VDC GROUND
3	RS485 Data -
4	RS485 Data +

RS485 / Power Pinout

- **DEBUG.** This connector is used during manufacturing to program the device.
- **RELAY.** This connector is used to attach a 10 pin ribbon cable to an external metal relay box.
- **LED's.** The Receiver has 6 small LED indicator on it with the following meanings:

LED COLOR	STATUS	MEANING
RED	**ON/OFF**	**Future Use**
BLUE	**FAST FLASH**	**This device is waiting for a new ID#**
	ON	**The Laser is Detected (Only with "Align LEDs" on)**
	OFF	**The Laser is not Detected (Only with "Align LEDs" on)**
YELLOW	**OFF**	**Power and Data No Good**
	FLASHING	**Power and Data Good**
GREEN	**OFF/ON**	**Future Use**
ORANGE	**ON**	**RELAY is active**
	OFF	**RELAY is inactive**
RED/ORANGE/BLUE	**FLASHING**	**This device has an invalid ID# and is waiting for the ID key**
WHITE	**ON/OFF**	**Future Use**

The Z-Touch:

While the brilliant laser beams are fantastic to see when you first enter, we thought we'd add more WOW to this attraction by creating our programmable Z-Touch. Rather than just a simple button like others use, we've created another unique device that has 32 bright LED's (8 red, 8 blue, 8 yellow and 8 green) to create any color. With just a few "clicks" inside the *LAZER FRENZY* software, you can choose to flash the unit, turn it on, or turn it off for endless possibilities.

In the center of the Z-Touch we've placed an oversized 2 inch red "arcade-style" pushbutton. Since we've put "intelligence" in our system to ensure its evolvement overtime, we can have this button trigger any number of effects. For example, we can have it start or stop a game. It can even trigger a camera to take a snapshot of the player in the game. It can tell the Z-Controller to reshuffle the lasers so if they travel back the way they came it will be different. These plus numerous others are all easily set-up with the *LAZER FRENZY* software.

The Z-Touch responds to commands from the Z-controller. It has the following connectors:

- **RS485/Power.** These 2 connectors are identical and are connected to each other. They receive 12Volt DC power and RS485 commands from the Z-controller.

There are 2 of these connectors to allow "Daisy Chain" connections between devices connected to the Z-Controller.

Pin #	Pin Name
1 & 6	Fused +12VDC
2 & 5	12VDC GROUND
3	RS485 Data -
4	RS485 Data +

RS485 / Power Pinout

- **DEBUG.** This connector is used during manufacturing to program the device.
- **RELAY.** This connector is used to attach a 10 pin ribbon cable to an external metal relay box.
- **OPTO I/O**. This connector has one opto isolated input and one opto isolated output. The input can be used to read switches or signals from some other computer or controller. The output is an open collector output that can be used to communicate with some other computer or controller.

Pin #	Pin Name
1	Int. +12V
2	Int. GND
3	Output O.C.
4	Output Emitter
5	24VDC Input LED Anode
6	24VDC Input LED Cathode

OPTO I/O Pinout

The Push Button Panel:

The Push Button panel allows players to select their game. It also acts as the interface between a coin mech input, or a card swipe interface, or a ticket dispenser.

Theory of Operation

This section of the manual is included for the interested reader. Nothing in this section is necessary for operation of the attraction, but it may help to make sense of the setup screens in the software.

The Lazer Frenzy system consists of a Windows XP based controller, the main Power Supply and controller box, and 4 different kinds of devices connected to the the controller box.

The RS485 ID

Each device that communicates with the Z-controller has to be assigned a unique ID#. The Lazer Frenzy system uses ID numbers between 1 and 90. This ID number determines when a device can transmit its messages on the RS485 bus. If two devices have the same ID#, then they will both try to transmit at the same time, and the driver chips will overheat. The driver chips are thermally protected and will restore themselves without any user intervention.

The Lazer Frezy system uses these ID numbers to control everything about the way the game plays, and so it is important that the installer label each device with the ID number after it is assigned. More about this in the installation and setup section.

The Lazer Frenzy system knows what kind of device it is talking to based on the ID number. Certain ID ranges are reserved for certain kinds of devices and are listed below:

ID Numbers	Type of Device
1	Z-Controller
2-8	Z-Touch
9	Bar Code Reader
10-49	Transmitter
50-89	Receiver
90	Push Button Panel

System Response Time

Each device in the Lazer Frenzy has its own clock and records event times accurate to 0.01 seconds. The system reports events to the PC eight times per second, but part of each message to the PC is the exact event time that it occurred. This is how the system maintains its 0.01 second resolution. It is part of the Z-Controllers job to keep all of the clocks in the devices synchronized.

Daisy Chaining

Each device is connected to the same 2 data wires on the RS485 bus. The Lazer Frenzy system supplies 12 VDC power and the 2 data wire using 6 conductor flat telephone wire. All of the devices have 2 of these connectors to allow the power and signal to be passed on to the next device in the chain.

The Z-controller has 9 output connectors that are all connected to each other and perform the same function. Any device can plug into any of the 9 output connectors, with the one limitation that any connector cannot put out more than 2.5 amps to all of the devices on the chain connected to that connector. For add reliability to the system, it is better to limit the current on any one chain to 2000 ma.

Type of Device	Approx. Current (mA)
Z-Touch	350
Transmitter Green	350
Transmitter Red	70
Receiver	45
Push Button Panel	400

As you can see from the table, the 2000 ma limit per "Daisy Chain" determines how many devices can be on the same chain. For instance, 6 Green transmitters would be the maximum allowed on one chain. You can mix and match device types on one chain as long as they don't draw more than 2000 ma. The current on the Receivers is low enough, that you could put the system maximum of 40 on the same chain and still be under 2000ma.

Hardware Installation and Checkout Instructions

This manual assumes that the Lazer Frenzy will be installed by trained installers who are familiar with the system, or by customers who are familiar with basics, such as plugging in a computer, monitor, USB printer, using a crimper, etc. This section focuses on the unique aspects of installing a Lazer Frenzy attraction.

Step 1. Connect the XP Controller

Plug all of the devices required into the XP controller. These devices include:

- Wireless Keyboard and Mouse Receiver (USB)
- Audience Monitor (XGA 1368 x 768) (15 pin D connector)
- Audience Monitor Power into UPS
- Camera (s) (RS170 Bayonet connectors)
- Camera Power Supply(s) into UPS
- Receipt Printer (Parallel or USB)
- Receipt Printer Power Supply into UPS
- Z-Controller (9 pin to RJ12 adapter) on COM port
- UPS connector (USB)
- Power Cord into UPS
- UPS into main power to attraction
- Audio Line Out into "Y" cable for audience Monitor and amplified speaker system
- Amplified Speaker System Power into UPS

Step 2. Boot the XP Controller

Boot the computer and make sure that the audio, video, cameras, keyboard, mouse, and printers are functional.

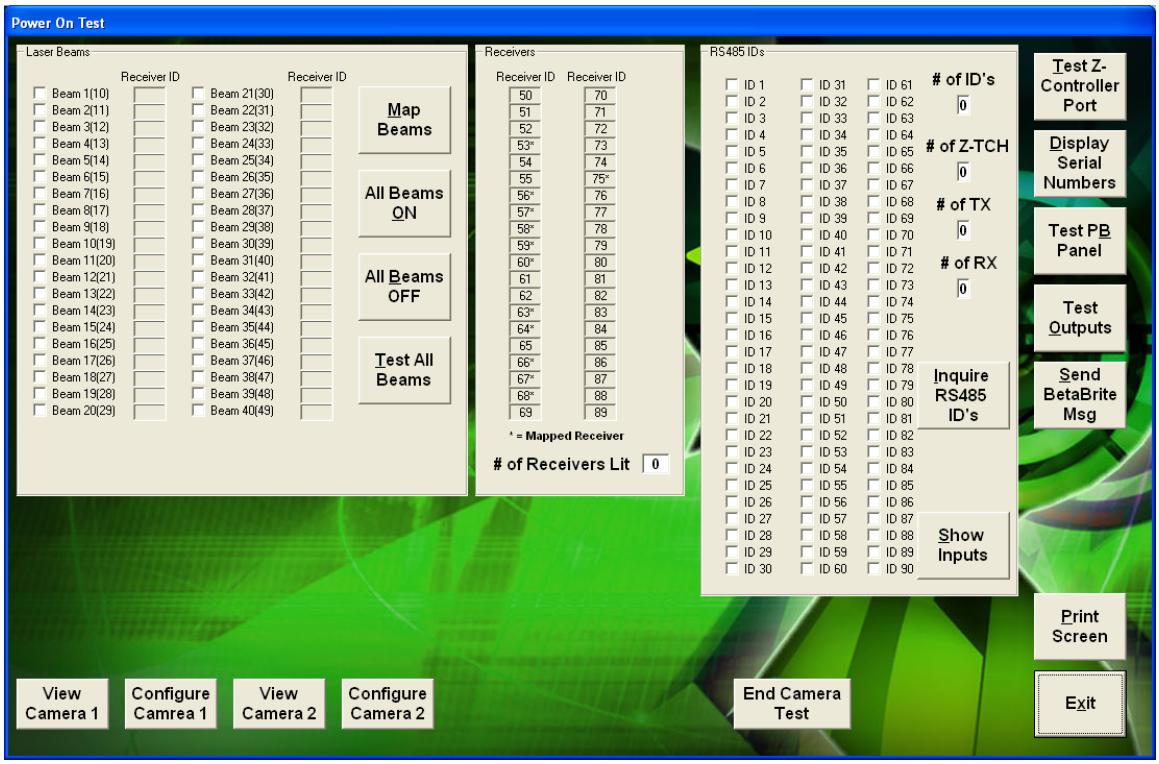
Step 3. Device Placement

Here are some tips on component placement

Step 4. The Z-Controller to PC Connection

Connect the Z-Controller to the 110VAC power using the Controller Power Input plug. Make a 6 wire connection between the "PC RS232" connector and the RJ12 to 9 pin adapter on the XP Controller. Go to the "Run System Tests" screen, shown below, and

click on “Test Controller Serial Port”. A message will show up showing success or failure of the test.



Step 5. Plan your Daisy Chains

Draw a layout showing how you plan to Daisy Chain the devices back to the Z-Controller. Add up the current on each of the daisy chains and make sure that each daisy chain is less than 2000 mA. Show how you plan to assign RS485 IDs to all of the RS485 devices on your plan. Store a copy of this plan along with this manual to make it easier to replace devices in the future.

Step 6. Connecting Devices

WARNING

> It is VERY IMPORTANT to ALWAYS turn this power off whenever plugging or unplugging any device into the RS485 connectors on the front of the controller. While you may not always damage the interface chip if you don’t, you will eventually destroy a device if you plug it or unplug it with the power on.

Connect each of the RS485 devices to the controller using 6 conductor 26ga flat telephone wire and RJ12 connectors. It is best to number and label both ends of the wires going between the Z-Controller and the first device on that chain. Mark these numbers on your wiring plan. This will make it much easier to find any bad wires or crimps when testing the system.

Place the devices loosely in the Z-tower pockets and connect them to the daisy chain shown on the plan. The last device on a chain will only have 1 wire going to it.

Step 7. Testing Connections

Once all of the devices are connected, go ahead and turn the Z-Controller on. There are several ways to verify that each device is connected properly.

Receivers, Transmitters, and the Push Button Panel. Each of these devices should have a flashing yellow LED on it. This indicates that power is good and that synchronizing data is being received from the Z-Controller. If the yellow LED is not flashing, then turn off the Z-Controller and unplug about half of the devices. Since all of the devices are daisy chained, a wiring error on one device can cause all of them to not work properly. Turn the Z-Controller back on and look for the yellow LED again.

Continue to disconnect devices until the problem is found. Correct the problem, and reconnect the devices. The most common problem is a bad or backwards crimp on the 6 conductor wire. Sometimes, the wires will have their position rotated, so check to make sure that the wires are in the same color coded position on both ends.

Step 8. Assigning IDs

Once all of the devices (except the Z-Touch modules) have passed the "Yellow LED" test, they are ready to have their RS 485 ID assigned to them according to the plan. The Z-Touch devices, the Transmitters, and the Receivers, all need an ID assigned to them. This is done by shorting pins 1 and 8 of the relay connector using a special jumper plug. This "REQUEST ID "shorting plug is installed on one device at a time.

All components should come from the manufacturer with an ID already assigned to it, and it should be labeled on the back of the component. You should only need to re-ID a component if you have duplicates or for some reason a component comes without an ID or is mislabeled creating a duplicate.

Start the ID assigning by pressing the "Align LED's ON" button.

When the "REQUEST ID" shorting plug is installed on one device, a message will pop up on the screen. When prompted for the ID, enter in the correct value from your plan for this device. After entering the ID, label the device, and the Z-Tower location with the ID number. This is very important so that anybody replacing a device won't have to change their game setups that refer to specific ID'd devices. The plan should show this same information, but plans tend to get lost.

Certain ID ranges are reserved for certain kinds of devices and are listed below:

ID Numbers	Type of Device
1	Z-Controller
2-8	Z-Touch
9	Bar Code Reader
10-49	Transmitter
50-89	Receiver
90	Push Button Panel

The Z-Controller, Bar Code Reader, and Push Button Panel are pre-assigned their ID and the ID cannot be changed.

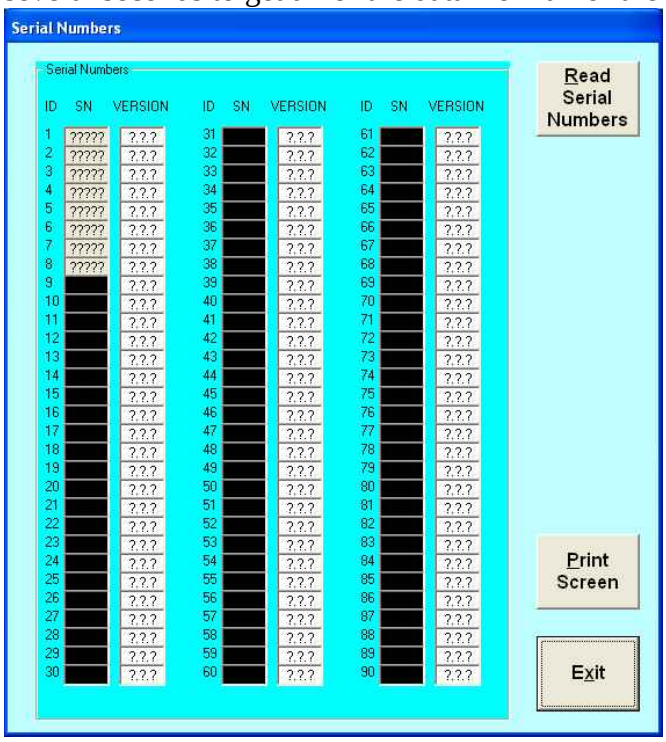
Any time you want to check your progress on assigning ID's, click on the "Inquire RS485 IDs" button. The screen will be updated showing which ID's are correctly installed and communicating with the Z-Controller.

The Start/Stop and checkpoint Z-Touch devices should have the following ID's in a basic set up. Start/Stop = ID 4, Checkpoint = 5. In an enhanced Lazer Frenzy Start = 4, Checkpoint = 5, and Stop = 6.

Once all of the devices have ID's assigned to them, you can get a readout of their ID#'s, their serial numbers, and their software versions.

Step 9. Printing Serial Numbers

To fill in the screen below, click on the "Display Serial Numbers" button. It may take several seconds to get all of the data from all of the devices.



Step 10. Aligning the Beams

The Laser Transmitters need to be aimed and aligned with the receivers. To do this, first click on the "Align LEDs ON" button. This will enable the blue LED on the receivers to indicate whether a laser beam is detected or not. You can also tell if the laser beam is detected on the Power On Test screen by looking at the data in the middle of the screen labeled "Receivers". If the laser is aimed properly at a receiver, there will be a checkbox next to the receiver and it will be highlighted green.

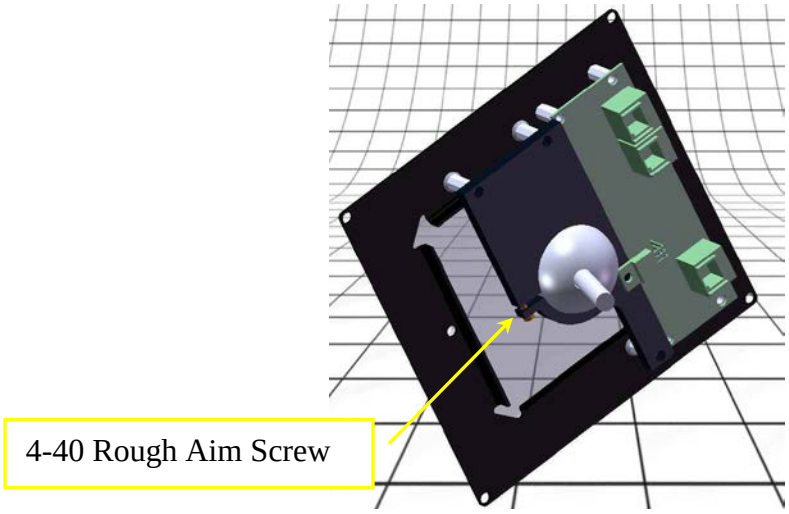
Install and tighten the Transmitter and Receiver modules using (4) #6 x ½" black pan head screws. These screws have a locking nylon strip embedded in them to maintain alignment. Make sure the (4) screws on the transmitters are tight to prevent the lasers from wandering over time.

Click on the "All Beams On" button to turn on all of the lasers. If it is easier, you can click on individual lasers to turn them on one at a time.

The Laser Transmitters have a "Rough Aim" and a "Fine Aim" mechanism. The "Rough Aim" is done with the Transmitter Window opened, and the "Fine Aim" is done with the Transmitter Window closed.

To accomplish a "Rough Aim", open the transmitter window by first loosening one of the screws at least 4 full turns, and then removing the opposite screw on the clear acrylic transmitter window. When you rotate the window, be careful not to scratch the window on the other screw heads.

Loosen the 4-40 hex screw that holds the white ball in place with a 3/32" hex wrench.

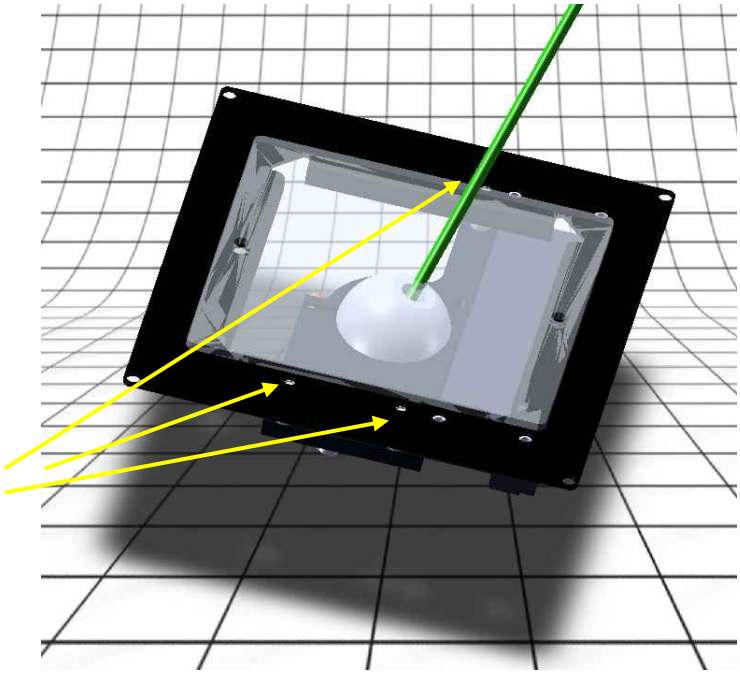


Insert the bent 6" long x 9/64" hex key wrench into the alignment tool hole in the front of the white ball. Rotate the ball until the laser hits the desired receiver in the middle of the receiver circuit board. Keep in mind that the receiver circuit board is behind the receiver diffuser by 1.5", so you may have to strike the laser off center in order to have the laser

beam hit the center of the circuit board. Verify that the blue LED is lit on the receiver. Tighten the 4-40 hex screw, remove the hex key alignment tool and replace the transmitter window. Don't worry if the laser shifts a little bit as you tighten the 4-40 screw and replace the window. This will be fixed in the "Fine Aim" step.

To accomplish the "Fine Aim", loosen the (3) Fine Aim screws one at a time.

(3) FineAim Screws



These screws have special spring mechanisms that allow small adjustments in the aim of the laser. They also have nylon locking devices in the screws so that they will stay adjusted without having to be tightened. Do not loosen these screws more than 1 ½ turns from fully tight, otherwise the springs will not be compressed and the laser aim will not be stable.

Step 11. Map the Beams

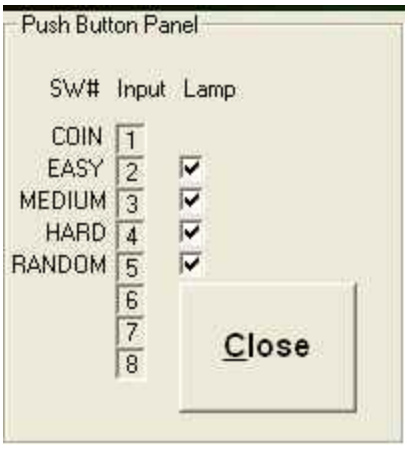
The Lazer Frenzy software needs to know which transmitters are aimed at which receivers. Once all of the lasers are aimed, and the "# of recievers lit" shows the correct number, click on the "Map Beams" button. This causes the software to turn on the beams one at a time and record which receiver is matched to which transmitter. You will have to do this anytime you re-configure which transmitter is aimed at which receiver.

Step 12. Test All Beams

Once the Beams are mapped, you can click on the "Test All Beams" button. The system will quickly verify that all of the receivers are seeing a valid laser.

Step 13. Test the Push Button Panel

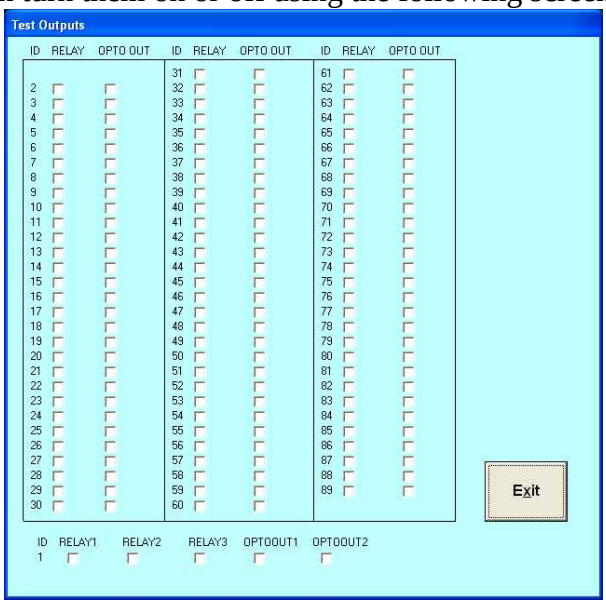
Push the "Test PB Panel" to bring up the following screen:



You should be able to turn each lamp on or off using the checkboxes, as well as see the switch action on the screen.

Step 14. Test Outputs

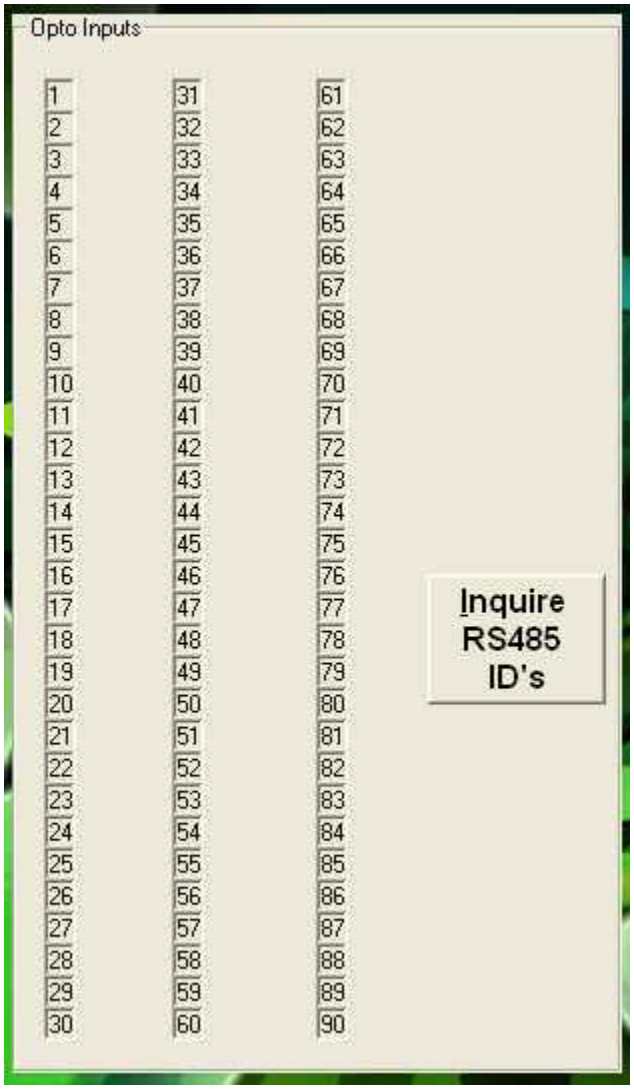
If any of the outputs on the devices are being used to control relays, or communicate with other devices, you can turn them on or off using the following screen:



Not all of the ID's have an OPTO-OUT device.

Step 15. Test Inputs

Some of the devices have optically isolated inputs (Z-Touch and Z-Controllers). These can be tested by clicking on the "Show Inputs" button.



If there is more than one input on device, the inputs are color coded for that device.

Step 16. Camera Brightness and Contrast

Under the Run System Tests menu there is a “View Camera 1” button. Once clicked it will allow you to adjust the brightness and contrast using the sliders while viewing the camera’s picture.

Step 17. Print a Hard Copy

Click on this button to make a hard copy of this page. Before clicking this button, click on “Inquire RS485 IDs” and “Test all Beams” to make sure that the screen is up to date.

Software Configuration

The Lazer Frenzy system ships with some games already configured and installed. Adjustments need to be made to accommodate installation specifics. The games can also be adjusted for different sound effects, which beams are lit, points, and many other game parameters.

Game Parameters

Here is a list of the game parameters and their meaning.

- Game Time. This is the maximum amount of time allowed to play this game. If a player has not hit the “Finish Button” yet, the game will end after this much time.
- Intial Points. The number of points that a player has before the game begins. You will lose points for beams broken and as time goes on.
- Points Per Second. You lose this many points per second. The game time is calculated down to .02 seconds.
- MP3 Playlist. Each game can be assigned a different playlist using the “Setup Music” screen.
- Difficulty Level. This is used to sort high score reports by difficulty. 1 is the easiest, 4 is the hardest.

- Beam Break Penalties. The Beam Break penalties can be assigned 3 different ways:
    - Fixed. Every beam that is broken takes away this many points.
    - Incrementing. The first beam is this many points, but each additional broken beam takes away more and more points. Each time a beam is broken, the penalty goes up by this amount.
- Z-Touch Cheating Penalties: To help prevent cheating, you can create cheating penalties to trigger.
    - Delay. This is the number of seconds
    - Penalty Points. The number of points players lose when they trigger a Z-Touch within the cheating delay
    - Maximum Presses. This allows the operator to limit the number of times a particular Z-Touch is pressed during a game.
- Beam Selection Mode. There are 2 ways to select which beams are activated for a game:
    - Fixed. Only beams that have a checkmark will be activated.
    - Random.
        - The computer will select a certain number of beams randomly from a pool of available beams. The number of beams to be selected is chosen using the "Number of Beams" box, and the pool of available beams is taken from the beams that have been checked in the table.
        - When choosing random you also have the option to randomize beams during the game. To use this feature click the "Randomize During Game" checkbox and use the slider to set the interval at which the beams will switch. This beam selection makes a significantly harder game.
            - A beam must make contact with the receiver before the beam will be considered broken. So, if a player is blocking a beam as it switches, it will not count as a break until the player moves away and re-breaks the beam.

There are two alternative scoring methods that can be chosen if you wish:

- The first alternative method scores by time alone, with a stop watch starting at the beginning of the game. You are then assessed penalty time with each beam broken. To use this method simply click the radio button associated with it, and adjust your points lost per beam break to the number of penalty seconds you wish to add for breaking a beam.
- The second alternative method scores by points on a fixed amount of time. To use this method you must change the script of the game heavily to create a loop players can follow, and you must remove the "Finish Game Timer" command from the end button. Also be sure to adjust the initial points, points per second, and bonus points (found in the script) to reflect the looping nature of the game.

In these modes, all other options above work as described in our standard scoring format. We have made the point system our default scoring method as we have found that players

prefer to get scores with lots of points, similar to that of many video games they play at home or in your arcade.

When you have made changes to a game configuration, don't forget to click on "Save" before exiting. You can click on "Print Hard Copy" to make a printed record of this game configuration.

If you want to create a new game configuration from an old one, click on the "New" button. A copy of your old game will be saved under the new name and you can then make any edits you like.

If you want to delete a game configuration, select the "Delete" button.

Edit Game Sequence

This screen allows the user to control many of the interactions with the hardware. The table of Actions in the middle could be different for every ID in the system. This allows you to have complete flexibility over the game. Each field and the possible choices are explained below.

ID#

Each action in the table is assigned to one specific RS485 ID device. Click on this column first to make sure that you editing the correct ID.

Trigger

There are 6 different things that can trigger an action for a specific ID. These are described below:

- "Input Activated". This trigger means that one of the input types has been activated on this ID. Sometimes you want a different action when a player is going into the Lazer Frenzy than when the player is coming out. If you designate a "Mandatory" button in the general setup screen, then this "Input Activated" trigger is only executed before the mandatory input is activated.

- "Input DeActivated". This trigger can be used when an input goes back to its normal state. This is rarely used.
- “Input Activated AND Mandatory". This trigger happens when a specific input is activated after the “Mandatory” button is pushed.
- “Beam Make". This trigger happens when a receiver first sees a laser beam.
- “Beam Break". This trigger happens when a receiver loses its laser beam.
- "Valid Bar Code". This trigger is used when a valid bar code is detected at the attraction. This trigger should not be used when not using bar codes.

Inputs

There are 3 different types of inputs that can trigger an action for a specific ID. These are described below:

- "Opto 1". This connector is available on the Z-Touch module and the Z-Controller device.
- "Opto 2". This connector is only available on the Z-Controller device.
- "TTL 1". This connector is only available on the Z-Touch module. This is the large lighted pushbutton.

Actions

When a trigger happens on a particular ID, you can cause the following list of actions to happen:

- “Play Sound Lobby". For Future use.
- "Play Sound Maze". This action will cause the selected sound to play over the main speakers.
- "Play Sound SubWoofer". For Future use.
- "Open Output". This causes the selected output on the selected ID to open. You can specifiy the duration. If you specify 0 for the duration, it will stay open until told otherwise.
- "Close Output". This causes the selected output on the selected ID to close. You can specifiy the duration. If you specify 0 for the duration, it will stay closed until told otherwise.
- "Pod LED's Off". This will turn all of the LED’s off on a Z-Touch. You must specify the ID of the Z-Touch you want. Valid IDs are 2-8.
- "Pod LED's Red". This will turn on the Red LED’s on a Z-Touch. You must specify the ID of the Z-Touch you want. Valid IDs are 2-8.
- "Pod LED's Green". This will turn on the Green LED’s on a Z-Touch. You must specify the ID of the Z-Touch you want. Valid IDs are 2-8.
- "Pod LED's Blue". This will turn on the Blue LED’s on a Z-Touch. You must specify the ID of the Z-Touch you want. Valid IDs are 2-8.
- "Pod LED's Yellow". This will turn on the Yellow LED’s on a Z-Touch. You must specify the ID of the Z-Touch you want. Valid IDs are 2-8.
- "Pod LED's Flash". This will turn cause the LED’s on the Z-Touch to flash. You must specify the ID of the Z-Touch you want. Valid IDs are 2-8.

- "Camera SnapShot". This will cause the system to take a snapshot with one of the cameras. You must specify which camera. Valid cameras are 1-4. The first snapshot you take will be stored and can be printed later on certain format scoresheets. Additional snapshots are spread on the audience monitor as the game progresses.
- "Activate Beam". This turns a laser on. You must specify a valid RS485 ID. Valid IDs for transmitters are 10-49.
- "DeActivate Beam". This turns a laser off. You must specify a valid RS485 ID. Valid IDs for transmitters are 10-49.
- "Turn Laser Off". Future Use
- "Turn Laser On". Future Use
- "Start Game Timer". This starts the clock on the game. It is usually triggered by the Z-Touch TTL1 input that you designate as the “Start Button”.
- "Finish Game Timer". This stops the clock on the game and calculates the final score. There can be more than one trigger that executes a “Finish Game Timer”.
- "Shuffle Laser Beams". This causes the Lazer Frenzy to reshuffle which beams are lit in a random game.
- "Activate Game Lasers". This action turns all of the selected lasers on.
- "Add Bonus Points". You can add or subtract points in the game based on any trigger. Use a positive number to add points and use a negative number to subtract points.
- "Sequence MP3 Playlist". A trigger can cause the MP3 playlist to move to the next song. This could be used to add excitement to the game as play progresses and Z-Touch devicese are pressed.
- "Select Camera". As players move through the attraction, you may want to select which camera is active. Valid cameras are 1-4. (1-2 with Webcams)
- "FreePlay On". This action sets the system up to skip the “Payment Verified” part of the software. The software assumes that payment is not required.
- "FreePlay Off". This action turns FreePlay off.

Action Target

Depending on which action is chosen, you may be asked to select the “target of your action”. For example, if your action was to play a sound, you will be asked to select the sound. If your action was to do something with an output, you will be asked which output on which ID. Another example of an action that requires a target would be a beam break that causes another beam to be activated.

If your action involved an output, you have to select from the list below. You can also enter the duration you would like to have the output affected.

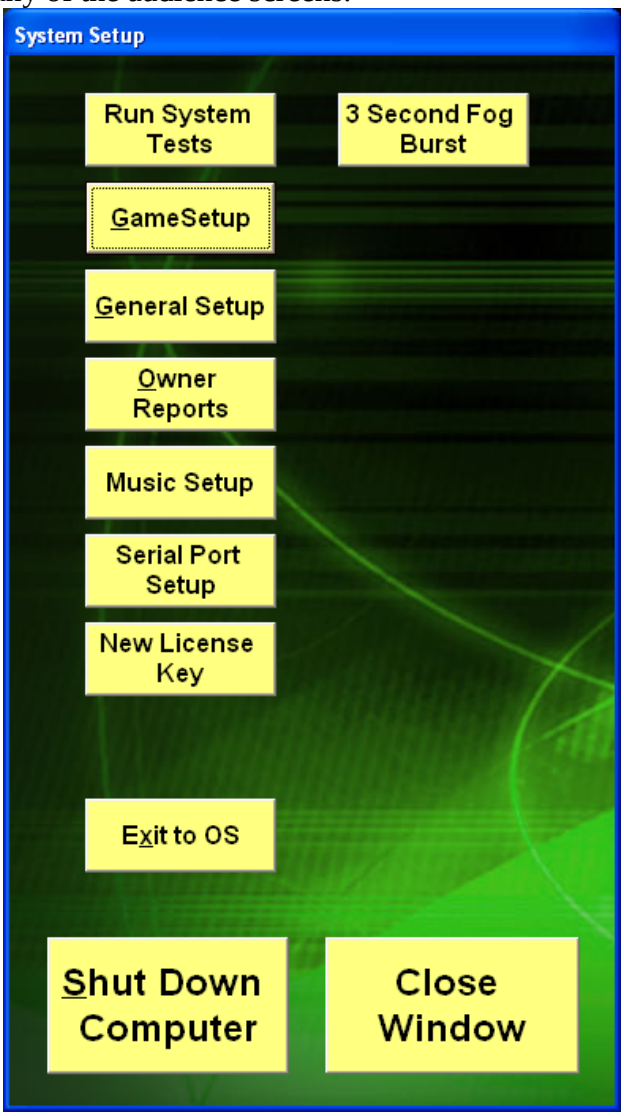
- “Relay 1 (N.O.)". All of the devices (except the Push button panel) have a Relay 1 output. The Z-controller has it built in, and the other devices use a ribbon cable to attach an optional relay box to it. It can be used to switch up to a 5 amp load at 125VAC. The combined load of Relay 1 and Relay 2 cannot exceed 5 amps.

- "Relay 2 (N.O.)". The Z-Controller has this built in. It can be used to switch up to a 5 amp load at 125 VAC. The combined load of Relay 1 and Relay 2 cannot exceed 5 amps.
- "Relay 3 (N.C.)". The Z-Controller has a 4 pin connector on the back to allow a user to have access to a software controlled relay. All 3 contacts of a SPDT relay are available, NO, COM, and NC.
- "OptoIso1 (O.C.)". This optically isolated open collector transister output is available on the Z-Touch and the Z-Controller. The isolator part number is 6N137 and a spec sheet is available on request.
- "OptoIso2 (O.C.)". This optically isolated open collector transister output is available on the Z-Controller. The isolator part number is 6N137 and a spec sheet is available on request.

Typically you will want to get the game sequence the way you want it for one game and then copy this game into other game formats.

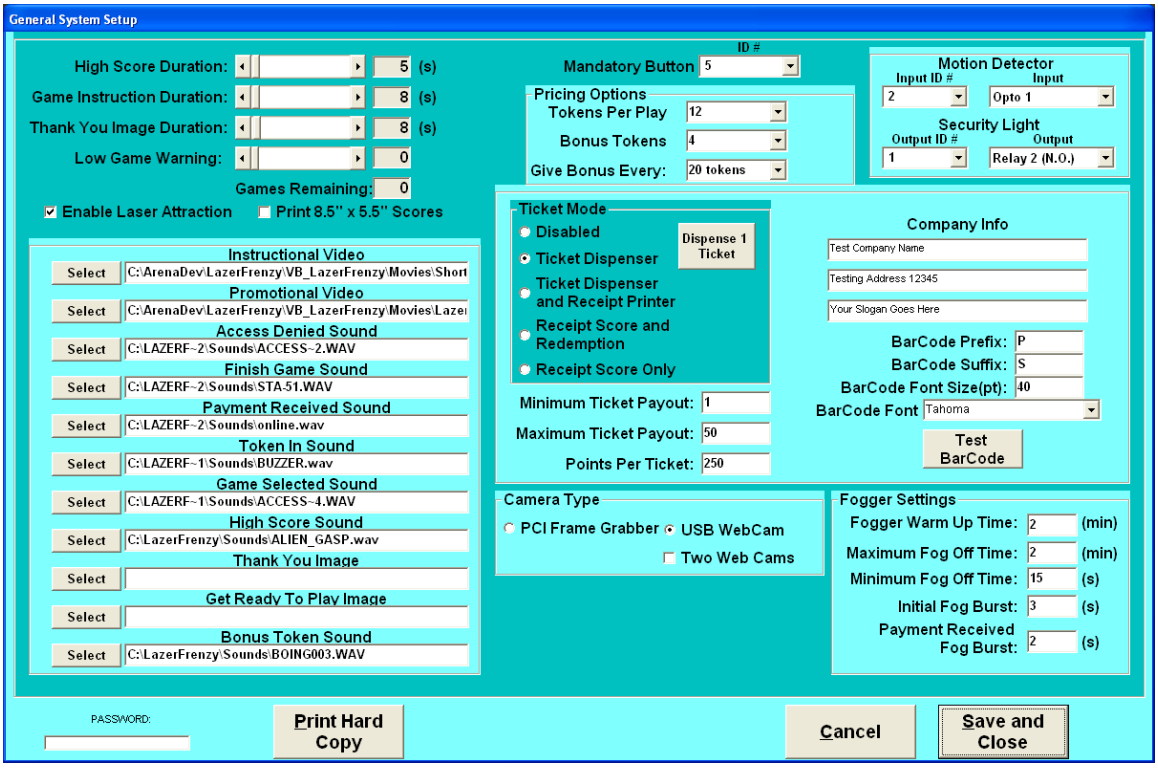
System Setup Screen

The following screen can be accessed by clicking the mouse in a hidden active area at the lower left corner of any of the audience screens.



The “Shut Down Computer” button can be used to immediately shut down the computer. The other buttons are covered in other sections.

General Setup Parameters



There are some things that apply to all of the games. These parameters are shown above and are described below.

- High Score Duration. In between games, you can decide how long the High Score screen is displayed
- Game Instruction Duration. In between games, you can decide how long the Game Instruction screen is displayed.
- Thank You Image Duration. In between games, you can decide how long the Thank You Image is displayed
- Low Game Warning. If license is game based, warns the operator when they are getting low on games.
- Enable Laser Attraction. This checkbox will cause the attraction to activate lasers and music randomly to make it inviting to play.
- Print 8.5” x 5.5” Scores. Check this box if you want score sheets to print after every game on a standard printer, otherwise uncheck it.
- Mandatory Button. This is the ID# of the Z-Touch that is positioned at the end of the attraction to determine that the player went all the way in. If the mandatory button is not pushed, the player will get a 0 score. Also, after this button is pushed, any input triggers will only trigger when the action = Input Activated AND Mandatory.
- Tokens Per Play. This controls how many tokens must be received before the game is allowed to start. The token switch input is SW0 on the Pushbutton Control Panel.
- Bonus Tokens. This is the number of bonus tokens you would like to give the customer after they put in X amount of tokens.

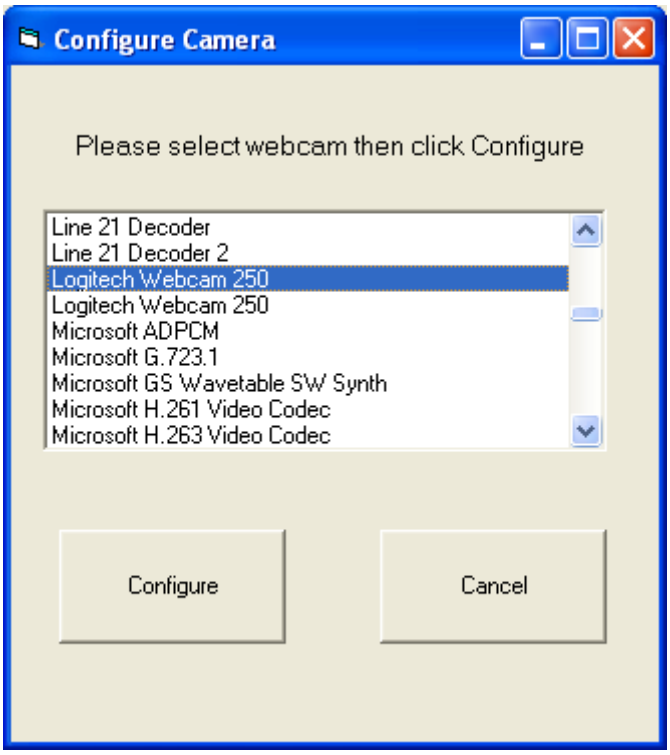
- Give Tokens Every X Tokens. Sets how many tokens a customer must put in to receive bonus tokens. This counter resets when a game starts.
- Motion Detector. This setting is used to tell the system where you plugged in a motion detector. You may use any ID# that has an opto isolated input. The Z-Controller has 2 inputs, so you must select which one you are using also. If motion is detected with no payment, it will turn off all lasers and energize a security light.
- Security Light. You may select any ID# and output to energize when the motion detector is tripped. The security light will stay lit for 30 seconds, or until payment is received, whichever occurs first.
- Ticket Mode.
    - Disabled. No tickets or game scores are printed or dispensed
    - Ticket Dispenser.* The system supports a Deltronics DL-1275 ticket dispenser
    - Receipt Score and Redemption. Every game prints a score sheet and the number of redemption tickets.
        - BarCode Prefix. If your redemption system needs a prefix, you can enter it here.
        - BarCode Suffix. If your redemption system needs a prefix, you can enter it here.
        - BarCode Font Size. This has to agree exactly with the bar code font selected and supported by the Epson receipt printer.
        - BarCode Font. These are the fonts supported by the Epson printer. Additional fonts that require message processing, such as interleave 2 of 5 are not yet supported. You have to adjust the font size to match the Epson printer driver settings for the font selected.
    - Receipt score only. Only the score sheet prints. No redemption info on it.
- Minimum Ticket Payout. You can set the minimum number of tickets dispensed per game.
- Maximum Ticket Payout. You can set the maximum number of tickets dispensed per game.
- Points Per Ticket. This is used to calculate the number of tickets based on the player's score. If it is lower than the minimum or higher than the maximum, the number will be adjusted to the minimum or maximum.
- Company Info. This info will print at the bottom of the score sheet if you have selected the "Receipt Printer" option.
- Instructional Video. This video plays while the game is inactive to teach players how to play.
- Promotional Video. This video plays while the game is inactive to promote Laser Frenzy.
- Access Denied Sound. This sound plays when a user input is rejected.
- Finish Game Sound. This sound plays when a game is finished, either because a "Finish Game Timer" trigger is activated, or because the maximum game time has been reached.
- Payment Received Sound. This sound is played when a full payment is received.
- Token In Sound. This sound is played when a token is received.
- Game Selected Sound. This sound is played when you select a game.

- High Score Sound. This sound is played when a player gets a high score.
- Thank You Image. This image is displayed after a player is finished with a game.
- Get Ready To Play Image. This image is displayed when full payment is received.
- Bonus Token Sound. This sound is played when someone receives bonus tokens.
- Camera Type:
    - PCI Frame Grabber. To select PCI Frame Grabber, click the check box and then configure the camera(s) on the "System Setup Page."
    - USB Web Cam. To select USB Web Cam, click the check box and the program will prompt you to configure the camera. See Configuring Web Cams.
        - Two Web Cam. To select Two Web Cam, first select USB Web Cam then click the check box. The program will prompt you to configure the camera. See Configuring Web Cams.
- Fogger Warm up Time. This is the number of minutes that the fogger needs to warm up. The attraction will not energize the fogger for this number of minutes after the program is started.
- Maximum Fog Off Time. This is the longest that the attraction will allow the fogger to not be energized. This sets the minimum fog level, regardless of how many plays the attraction is getting.
- Minimum Fog Off Time. This is the number of seconds that must elapse before the fogger will re-energize. This prevents too much fog when the attraction is getting continuous play.
- Initial Fog Burst. This is the number of seconds that the attraction energizes the fogger when the warmup time has elapsed and it is getting the attraction ready for the first game play.
- Payment Received Fog Burst. This is how long the fogger is energized when a payment is received, if all of the other criteria are met.

- The ticket dispenser software remembers how many tickets are owed in the event the tickets run out. All the operator needs to do is insert new tickets and the dispenser will pay out the balance. To clear this memory, push all four input buttons (Easy, Medium, Hard, Random) **BEFORE** inserting additional tickets. Alternatively, cycling power on the Z-Touch Controller will reset the memory.

Configuring Web Cams

To configure one or two web cams, first select the USB Web Cam or Two Web Cam check boxes on the General Setup page. When selecting the check boxes the program will prompt you to configure. You can get to this configure screen by going to the "Run System Tests" page and clicking "Configure Camera 1" or "Configure Camera 2."



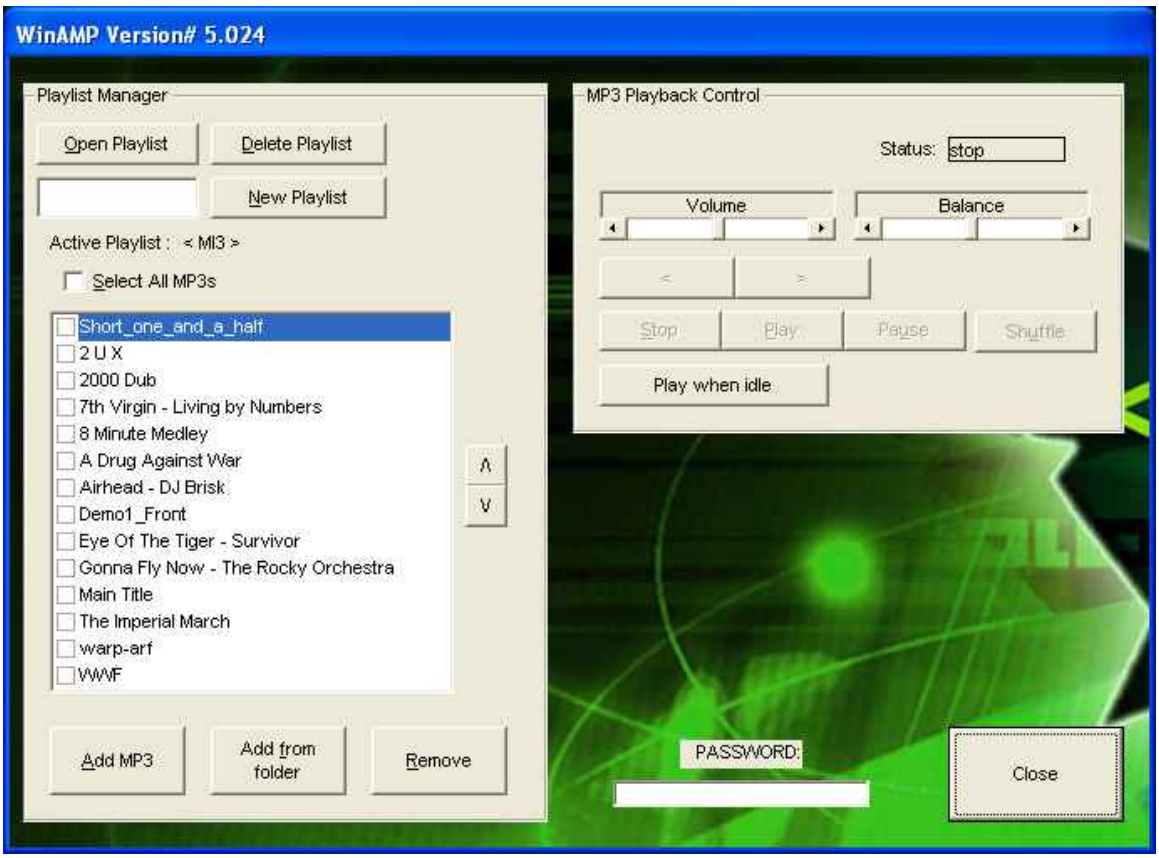
The configure screen has a long list of all possible inputs. To select your webcam, scroll down until you find the name of your webcam. In this example we are using a Logitech Webcam 250. Once you select your webcam click "Configure." This will then prompt you to unplug all webcams except the one you are configuring, and then click OK. This will bring up the driver specific dialogues to configure brightness, contrast, and white balance. Configure them to your liking and then save your changes. Congratulations, your webcam is configured.

Note: you may have to restart the program when plugging in webcams for them to appear on the list.

Optional Profanity Filter

The software supports high score initial filtering. Create a file in "C:\LaserFrenzy" called "Language.txt" to enable this feature. In this text file, list all three letter initial combinations you would wish to block on separate lines, one three letter combination per line.

Music Setup

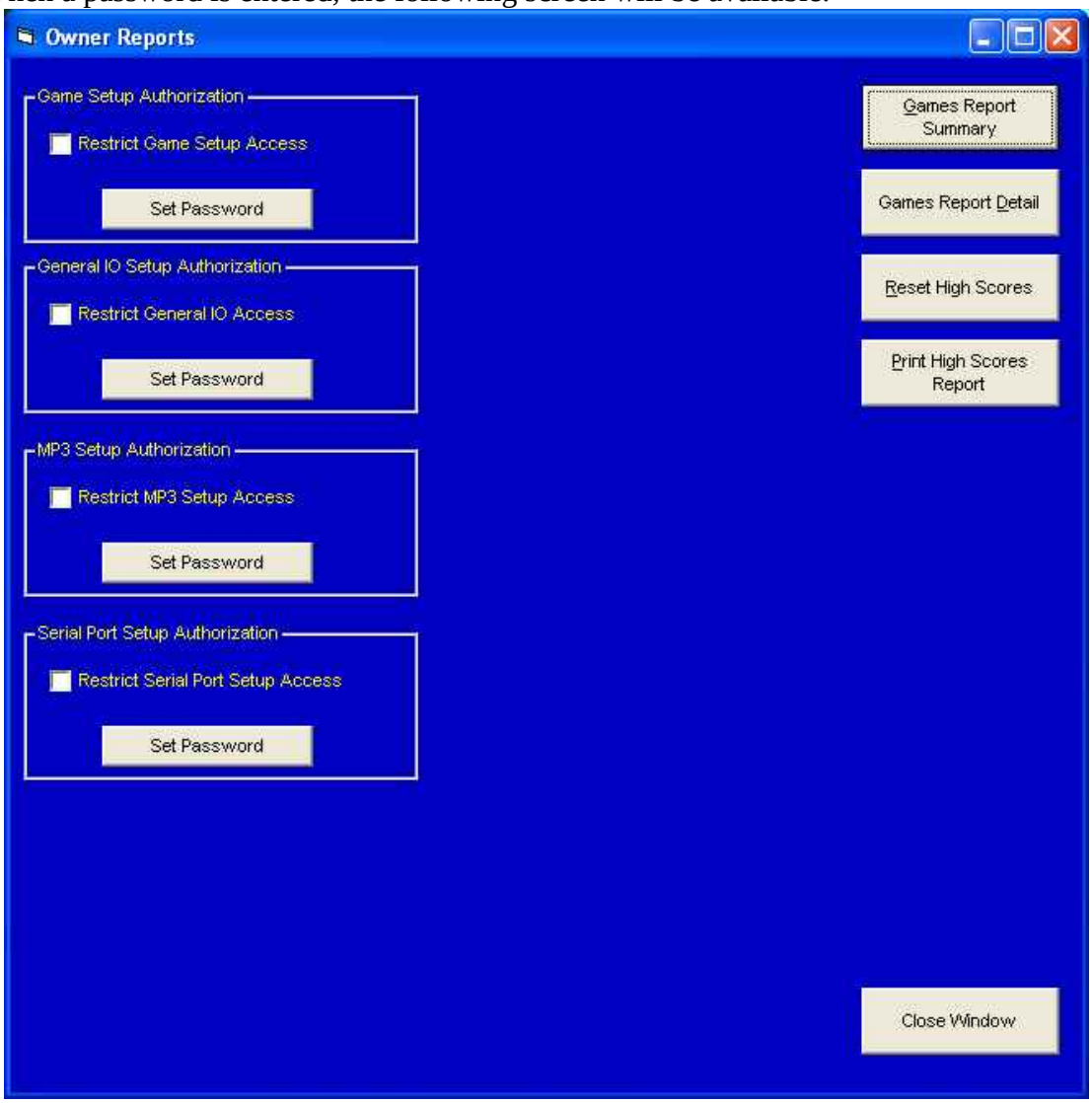


This screen is used to edit the playlists being sent to the Winamp media player. Each game can refer to a different playlist, if you desire.

Owner Reports

Any screen that has a password on it can be locked out of normal access.

When a password is entered, the following screen will be available.



This screen allows you to restrict access to the screens shown. Check the checkbox if you want to restrict access to that area of the program.

If you click on the "Set Password" button, you will be prompted for a password. If you do not click on this button, and have the checkbox checked, that area will still be restricted, but it will use the same master password that you used to get into this screen. This allows you to have different passwords for different areas of the program.

Games Report Summary

This will print a summary of the number of plays for the last 31 days. You can choose to print it to either the screen or to a printer.

Games Report Detail

This will print a list of every game played for the last 31 days. You can choose to print it to either the screen or to a printer.

Reset High Scores

This will reset the high scores. This can be used for prize contests.

Print High Scores Report

This will print a summary of the top players for each of the 4 difficulty games.

Serial Ports

This screen is used to configure which serial ports are used for various devices. The only device supported in this software revision is the Maze Device Controller (The Z-Controller). It will most likely be set to COM 1.

Initial Software Installation and XP Controller configuration

The Lazer Frenzy XP controller comes with operating system and software fully installed. It is also distributed on an installation CD. These software installation instructions assume that you are very familiar with the use of the Windows XP operating system.

The following items are needed to do a full installation of the software:

- Lazer Frenzy Installation CD
- Operating System Installation CD
- Computer Motherboard, Graphics, Sound, and Network Driver CD
- UPS Driver CD

Here are the steps to installing Lazer Frenzy software on the Controller computer. In order to load software onto the computer, you must temporarily install a CD drive. We find an external USB based CD with its own power supply is a very easy way to load software. Once the network drivers are installed, you can setup access to any CD drive on any other computer on the network and you no longer need the external CD drive to load software.

Install XP SP2 or SP3, Home Version or Professional Version

Load the Operating System Installation Disk into the external CD and boot the computer. Follow all of the prompts with the default responses, except as indicated below:

- Set the UserName to "LazerFrenzy"
- Set the TimeZone to the Customer's time zone
- Set the Computer Name to "CreativeXX" where XX is the last 2 digits of the SN of the Z-Controller that goes with the system.
- Set the network name to the name of the network that you are going to use if you load the LazerFrenzy software from the network. Remember to change the name of the network to "CreativeWorks" when finished loading.

Install Motherboard chipset Drivers

Load the Motherboard chipset driver disk into the external CD. When prompted, click on "Install Drivers". Make sure you load the chipset drivers in the following order: Chipset drivers, Video Drivers, Sound Drivers, Network Drivers. Follow the prompts with the default responses.

Perform Windows Update

Go to the control panel and select "Windows Update". Follow all of the prompts, except the following:

- Deselect Internet Explorer 7 or 8,

- Use the “Custom” option so that Windows Update looks for any hardware updates. Accept any hardware updates, but not any optional updates.

Install Frame Grabber Software

Make a folder on the C: drive called “C:\LazerFrenzy_CD”. Copy all of the contents of the Lazer Frenzy Installation CD to this folder.

Go to the “C:\LazerFrenzy_CD\Tools\FrameGrabber” folder and click on the “setup.exe” file and follow all of the default prompts.

Go to the hardware device manager window. An easy way to get there is to hit the windows key and the Pause/Break key at the same time. Under the Hardware tab is the “Device Manager”. Under Imaging Devices, you can selet the frame grabber and click on “Update Driver”. Choose the “Install from a list or a specific location (Advanced)” option. Use the “Browse” button to aim the installer at the “C:\LazerFrenzy_CD\Tools\FrameGrabber” folder. Do this for both devices shown under “Image Devices”.

Make sure that the file “sxdrv98.sys” is located in the “C:\Windows\System32\drivers” folder. If not, copy it from the “C:\LazerFrenzy_CD\Tools\FrameGrabber” folder to the “C:\Windows\System32\drivers” folder.

After the Frame Grabber Software is installed, you can verify proper operation by clicking on the application “Sample1”. Make sure you select the video source, and you should see live video on the screen.

Install Lazer Frenzy Software

Using Windows Explorer, click on the file “install.bat” that is in the “C:\LazerFrenzy_CD” folder. Accept all of the default prompts. If the software detects that you are going to install older software over newer software it prompts you. Read the message carefully and keep the newer software.

Install WinAmp Software

Click on the winamp executable software in the “C:\LazerFrenzy_CD” folder. Install the bare minimum configuration so that Winamp doesn’t try to access the internet. Don’t install the portable device support, the CDDB support, or GraceNote support. Make sure you choose “Not connected to the Internet”.

Install Printer Software

If you are using the Epson Receipt printer to print score sheets and redemption tickets, you need to install the printer software. Click on ATM302E.exe and follow the instructions. Make sure you select the correct Operating System (XP), port type (either parallel or USB), and Model Number (EPSON TM-T88IV RECEIPT).
Find "PRINTERS AND FAXES", right click and click on “Printing Preferences.”

Under the “Operation “ tab, click on “END OF DOCUMENT” and under paper cut, check "FEED TO CUT POSITION BEFORE CUT".

Install PrimoPDF from the “C:\LazerFrenzy_CD\Tools” folder. Select the Receipt Printer as the default printer.

Install UPS Software

Load the UPS Power chute Software CD and follow the default instructions.

Test the system by pulling the plug on the UPS. The computer should do an orderly shutdown. When plugging the UPS back in, it should reboot the computer automatically.

Configure Windows

Run Media Player once. Choose all of the options that do not require access to the internet.

AutoHide the Taskbar
Deselect “Hide Inactive Icons”
Select the background for the desktop
Disable all Screensavers
Set the Power Settings to leave everything on at all times.

Redemption Table

This section of the manual provides you with a redemption table showing the factory settings of Lazer Frenzy and the ticket payouts you can expect. You can alter the results to your desired ticket payout by either adjusting the ticket settings in the General Setup menu or by altering the points given and taken away in each of the game formats.

	Easy	**Medium**	**Hard**
Max Ticket Payout	50	50	50
Min Ticket Payout	1	1	1
Starting Points	5,000	10,000	15,000
Beam Break Points	200	400	600
Activated Beams	5x2	7x2	9x2
Max Penalty for Beam Breaks	2,000	5,600	10,800
Resulting Score Breaking all Beams	3,000	4,400	4,200
Ticket Payout w/ all Beams Broken (not including time penalties)	12	17	17

Trouble Shooting

This section of the manual provides some ideas for fixing problems that you may encounter. Even though it sounds made up, most problems involve a device that has been unplugged, or is not turned on. The first thing to check if something is not working is whether the power is turned on and it is plugged in.

Laser Aim Drift

This is usually caused by not tightening the hex screw in the transmitter tight enough or by the building settling. If you loosen the "Fine Aim" screws more than 1½ turns from fully tight, the springs will run out of adjustment range and leave the laser aim loose.
Pages 22-23 cover in depth how to align the transmitters

A Device is missing from the ID List

If a device that used to be shown in the ID list is no longer showing, it may be

- Unplugged. Make sure it is plugged in and "clicked" into place.
- Corroded Connector. Try unplugging it and plugging it back in. If this solves the problem, you may want to replace the connector on the wire fed to it, or you many want to replace the connector on the device.
- If the Yellow LED is on, but not blinking, then the power is good to the device, but the 2 middle wires that contain the data may be corrupted.
- It is possible that you somehow have 2 devices that are assigned to the same ID#.

Pages 20-21 cover in depth how to assign ID's to the devices

None of the lasers are Lit

All of the lasers will come on for 2 seconds when the Z-Controller is first turned on. This will happen regardless of whether the data lines are good to the device.

- Check to make sure that the green LED on the Z-Controller is on, indicating that the power supply in the Z-Controller is good.
- Check if the Yellow LEDs are lit or blinking. If the Yellow LED is on, but not blinking, then the power is good to the device, but the 2 middle wires that contain the data may be corrupted.

There is no sound on the speakers

- Make sure the pilot light on the speakers is lit
- Make sure that the volume icon in the taskbar of the computer is not muted
- Choose any sound in the general setup menu to play a test sound

Score Sheets don't Print

- Check all plugs
- Make sure printer is turned on
- Make sure there is paper in the printer and there is no "Error light"

- Check the Control Panel, Printers section and make sure the correct printer is selected as the default
- Make sure that “Print Scores” is checked in the general setup menu.
- Try to print a simple “Hello World” document from notepad.

Keyboard or Mouse don’t work

- Make sure the batteries aren’t dead on the wireless keyboard and mouse.
- Make sure the wireless keyboard and mouse receiver is plugged into the USB port.