EscapeKeeper

& EscapeKeeper JR

OPERATING MANUAL

877-815-5744 or 905-803-9274

www.frightideas.com

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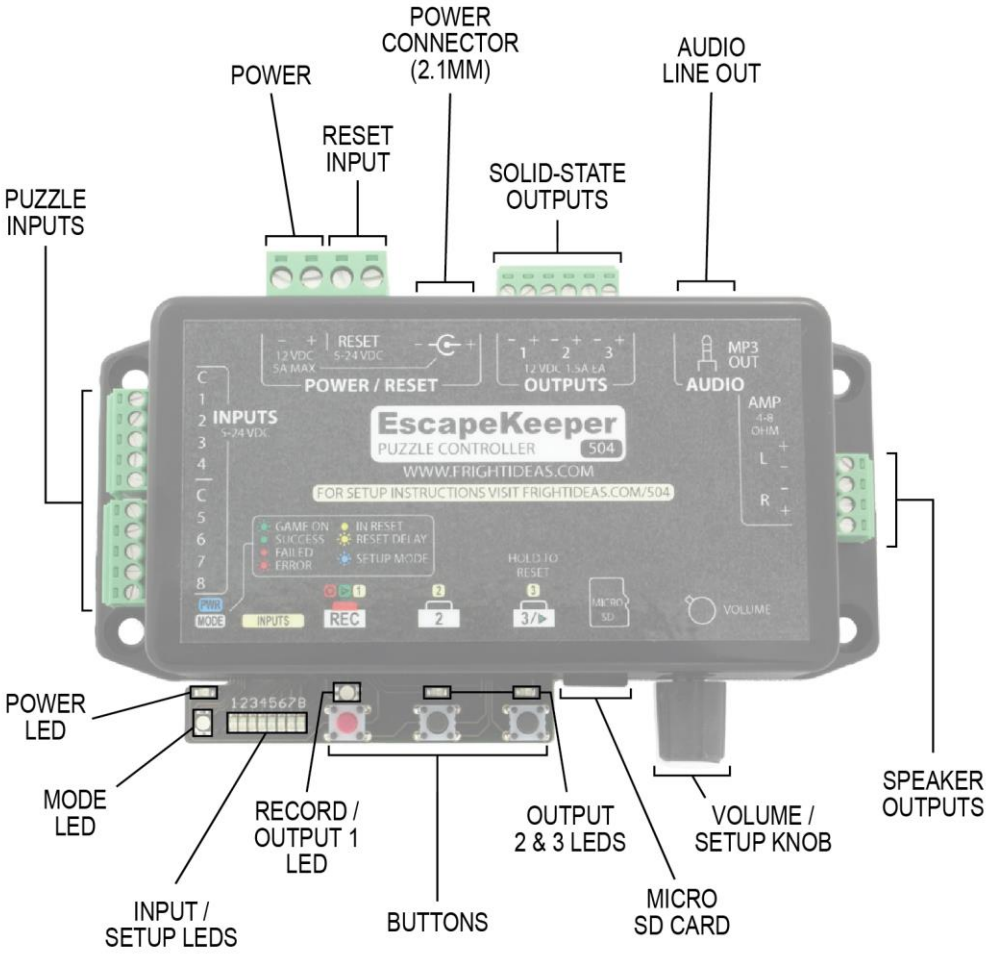
Getting Familiar with your EscapeKeeper

Connections and Controls



CONNECTIONS AND CONTROLS	
Power	12 VDC Input / Output. Internally connected to 2.1mm Power Connector
Reset Input	5-24 VDC Input can be used to disable or reset the puzzle
Power Connector	Power connector for standard 2.1mm center-positive power supply
Solid-State Outputs	One success output and two programmable outputs
Audio Line Out	3.5mm stereo line-level output for connection to external amp
Speaker Outputs	35 watt stereo (2 x 17.5W) amp to directly drive speakers
Volume / Setup Knob	Speaker output volume knob. Also used to adjust settings in setup mode.
Micro SD Card	Micro SD card socket
Output 2 & 3 LEDs	Output 2 & 3 status LEDs
Buttons	Buttons to setup, program, and control the Escape Keeper
Record / Output 1 LED	Indicates animation record / playback and output 1 status
Input / Setup LEDs	Eight input status LEDs. Also used to display settings in setup mode.
Mode LED	Indicates current state of controller (Idle, Game On, Success, Failure, etc.)
Power LED	Blue power LED
Puzzle Inputs	Eight 5-25 VDC puzzle inputs for connection to sensors, buttons, etc.

Your Current Firmware Version

It's important to keep your firmware up to date to fix any bugs, get all the latest features, and to stay current with this manual. This manual will always refer to the most current firmware. If you're trying to use it as a guide for a different version of firmware you may find things don't make sense.

You can always get the latest firmware from our website. See the Upgrading your Firmware section below for more information.

To know if a firmware update is required you need to know the current version running in your unit. The current version is flashed on the input LEDs during the boot sequence. If your version is different from the one we've posted online you should update. You can read the version history online to see what's changed between your current version and the latest.

See the table below to learn how to read the current version in your EscapeKeeper.

LEDS DURING BOOT SEQUENCE	
Mode LED	**Boot Sequence Step**
	**Step 1 - Firmware Check** The Mode LED will turn green for a few seconds as it validates the installed firmware.
	**Step 2 - Current Version Display** When the mode LED turns yellow the EscapeKeeper will indicate the current firmware version on the eight input LEDs. It will show two patterns. If it turns on the 1 LED, followed by the 2 & 3 LEDs, that would be version 1.23. If it flashes the 2 LED followed by just the 5 LED, that would be version 2.05.
	There are a few more blinks in the boot sequence. The full sequence is posted in the Operation section.

Upgrading your Firmware

You can download the latest firmware at one of the addresses below …

EscapeKeeper	help.frightideas.com/504
EscapeKeeper JR	help.frightideas.com/503

The firmware download will be a zip file. Open the zip file by double-clicking on it. Inside you should find two BIN files, 503EFRM.BIN and 504EFRM.BIN. Copy both files into the EK folder on your SD card. If there is no EK folder, you can create one or insert your SD card into the EscapeKeeper for 15 seconds and it will create it for you. If you are asked to replace existing files select "Yes".

Once you insert the SD card into the EscapeKeeper the Mode LED should blink green for about 90 seconds as it updates.

Watch some Videos

We have lots of tutorial videos posted at the help addresses above. If you prefer to learn by seeing us go through the setup steps in a video please check them out.

Power Supply Requirements

Power can be supplied using the barrel connector or the terminal block in the Power / Reset area. Both connectors are internally connected. This means if you are powering the EscapeKeeper from a 2.1mm power supply you can easily borrow some of that power through the terminal block.

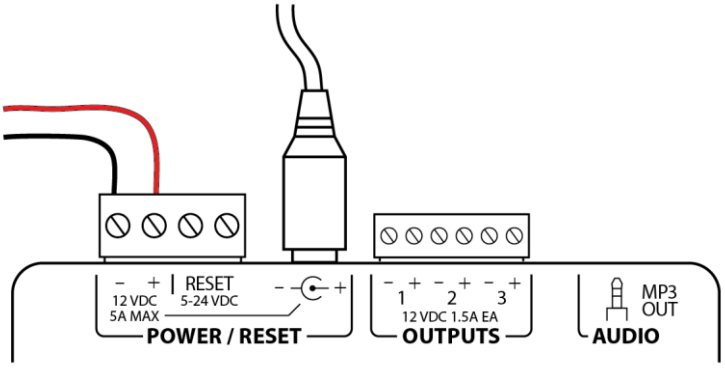
Sizing your Power Supply

The EscapeKeeper normally ships with a 12 volt DC 1 amp power supply. That's large enough to power the EscapeKeeper, a typical maglock, and a few low wattage accessories. If you will be controlling high wattage devices like a solenoid latch, or really cranking the built-in amplifier, then you will likely need a larger power supply.
To calculate how large your power supply needs to be you must add up the wattage of the EscapeKeeper, any outputs, powered sensors, and other devices that may be borrowing power from the same supply.

ESCAPEKEEPER POWER REQUIREMENTS	
No Use of Amp	100mA (1.2 watts)
Light Use of Amp	500mA (6 watts)
Heavy Use of Amp	2.5A (30 watts)

A 12 VDC 5A power supply is available as an upgrade option and is adequate for most demanding applications.

Whichever power supply you choose, the voltage **MUST be 12VDC**.



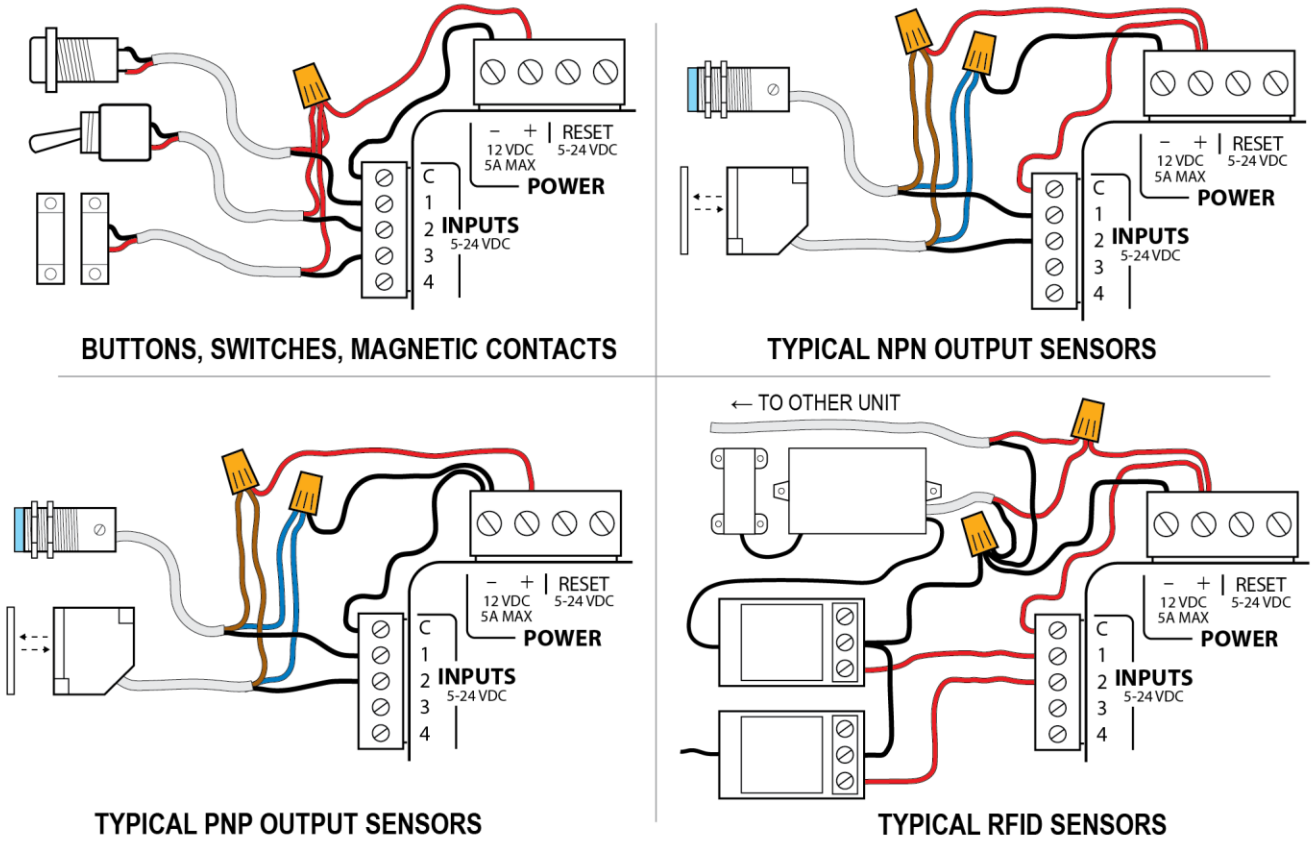
Inputs

Puzzle Inputs

The EscapeKeeper has eight puzzle inputs that can be connected to pushbuttons, sensors, switches, or other controllers. Anything that can output 5 to 24 VDC or complete an electrical circuit can be used as a puzzle input. The EscapeKeeper will monitor these inputs when it's in game mode to decide if the players have solved the puzzle. How it does that depends on the current puzzle mode and your recorded solution. See the Selecting your Puzzle Mode section for more information on how these inputs are evaluated during the game.

If you have extra inputs available they can still be used to play sounds. This could be useful if you want a hint button that either the players or game master can press. You could also connect them to sensors if for example you wanted a sound to play when a player opened a door or moved an object.

Puzzle Input Wiring Diagrams



Reset Input

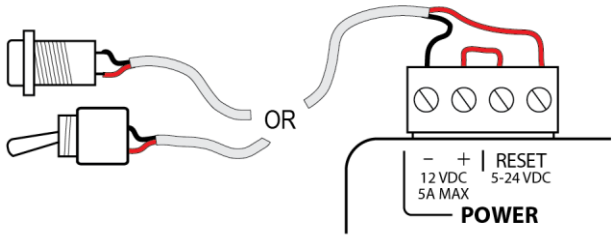
The reset input can be connected an external reset button or switch. This would usually be located in a staff area and used to reset the EscapeKeeper to prepare it for the next group. The “3” button on the EscapeKeeper can also be used to reset the EscapeKeeper and restart the puzzle if that’s preferred.

The reset input can also be connected to an external controller like another EscapeKeeper or a master controller like a FlexMax or PLC. This would allow the master controller to keep this puzzle inactive until a previous puzzle has completed or other conditions have been met. To see a diagram showing how to link this EscapeKeeper to another one see Linking To Another EscapeKeeper in the Outputs section.

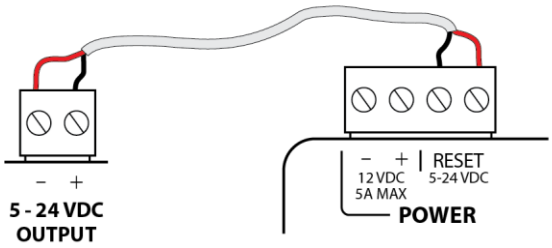
Auto Reset

Manually resetting the EscapeKeeper is not mandatory. You can use the Auto Reset option to automatically reset the puzzle immediately, or a certain amount of time after the puzzle has been solved. A manual reset is likely preferred if you only want a puzzle to be solved once, or if you are using a game timer to limit the amount of time they have to solve the puzzle.

Reset Input Wiring Diagrams



RESET BUTTON OR SWITCH



RESET BY MASTER CONTROLLER

Puzzle Bypass

Input 8 can be used to manually bypass the puzzle if the players aren’t able to figure it out. This would usually be connected to a pushbutton in the game master area. When pressed, it would immediately trigger the success scene so output 1 switches to the success state and any success animation on outputs 2 & 3 is played. See Advanced Options for information on enabling this feature.

Outputs

About the Outputs

The EscapeKeeper has three solid-state outputs. Output 1 is dedicated to indicating the success of the puzzle. This is usually connected to a maglock, solenoid latch, pneumatic solenoid, light, etc. By default, output 2 will turn on when the puzzle is solved, output 3 will stay on *until* the puzzle is solved. But this behavior can be overridden by programming your own output animation. Different animation can be played when the game starts, the game is running, they make a mistake (we call this a miss), solve the puzzle, or if they fail.

See Output 1 Mode in the settings section to control the behavior of output 1.

See Recording Output Animation to learn how to record animation for outputs 2 & 3.

Output Ratings

All outputs are solid-state and will output 12 VDC when they turn on. Output 1 can output up to 2.5 amps (30 watts). Outputs 2 & 3 output up to 1.5 amps (18 watts). All outputs are rated for inductive loads like maglocks, solenoids, and relays.

Make sure your power supply is large enough to handle all the current the outputs will require, as well as some for the EscapeKeeper itself. If the power supply is too small it will likely reset and the EscapeKeeper will reboot. For more information on sizing your power supply see Power Supply Requirements.

Fault Protection

If the outputs are shorted or you exceed their current limit for too long they will automatically shut down. They will turn back on once the fault is removed.

Checking the Outputs with a Volt Meter

The protection circuitry inside the solid-state outputs leak voltage at a very low current. This current isn't enough to turn on anything, but it is enough to trick a volt meter into thinking there's 12 volts at the output even when they are off. This will only happen if you don't have a load connected. Once a load is connected to the output the voltage should drop close to zero.

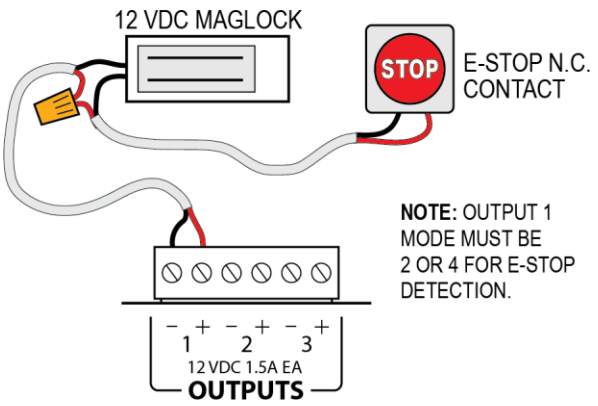
E-Stop Detection

Output 1 has special circuitry in it to monitor the current flowing through the output. This feature allows the EscapeKeeper to detect if the lock circuit has been interrupted due to an E-Stop button being pressed. When this condition is detected the EscapeKeeper can be set to turn off Output 1 and go into an alarm state. This notifies the staff and prevents the door from being locked again if the E-Stop button is released.

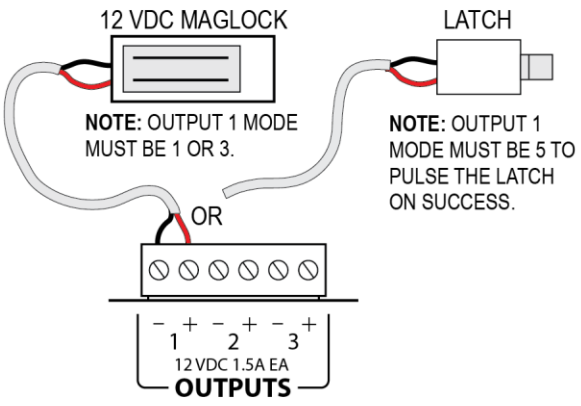
The alarm can only be silenced by pressing button 3 or by pulsing the Reset input.

E-Stop Detection must be enabled when setting the Output 1 Mode during setup.

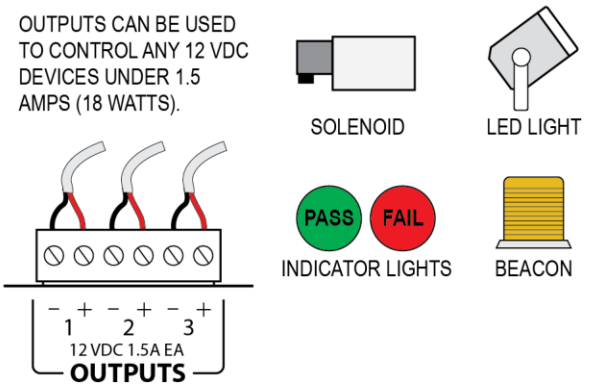
Output Wiring Diagrams



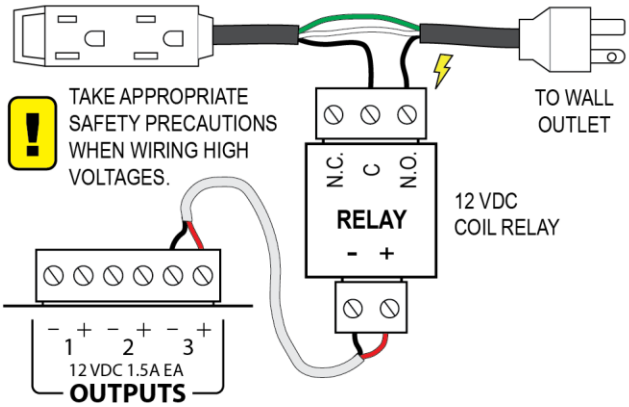
MAGLOCK WITH E-STOP DETECTION



MAGLOCK OR SOLENOID LATCH



ANY 12 VDC DEVICE



ANY 110 VOLT LOAD

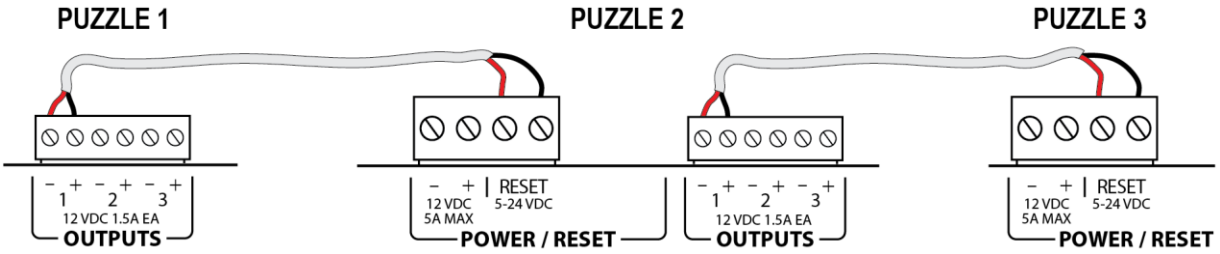
Linking to Another EscapeKeeper

EscapeKeepers can be linked together using the reset input to ensure multiple puzzles are solved in a particular order. Any EscapeKeepers held in reset will be inactive, meaning they will not play sounds or change their outputs if players interact with their inputs. They will also keep their outputs in the unsolved state, which means any maglocks will remain locked.

When the first puzzle is solved, any success sound in that puzzle will play. A few seconds after the sound finishes the next puzzle will be released from reset. Any Start sound and animation in that puzzle will then be allowed to play.

We recommend waiting to link the EscapeKeepers together until all the programming is done. Otherwise the additional EscapeKeepers will be held in reset as you try to program them.

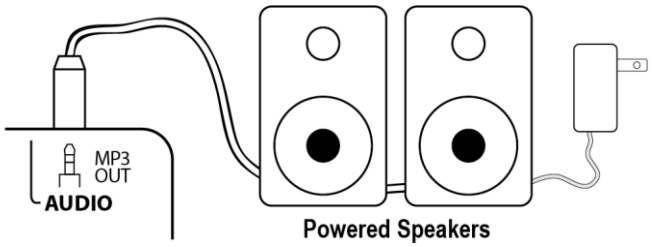
NOTE: The Output 1 Mode of any EscapeKeeper holding another unit in reset must be set to *Link Mode*.



Audio Outputs

Line Level Output

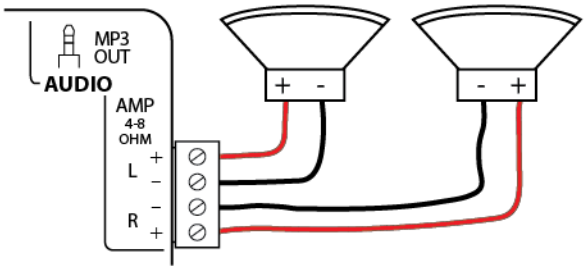
Use the line-level output to connect to an external amplifier or powered speakers.



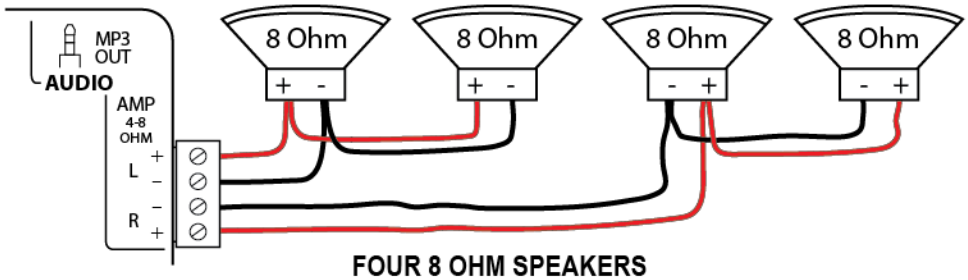
POWERED SPEAKERS OR AN EXTERNAL AMPLIFIER

Amplified Speaker Outputs

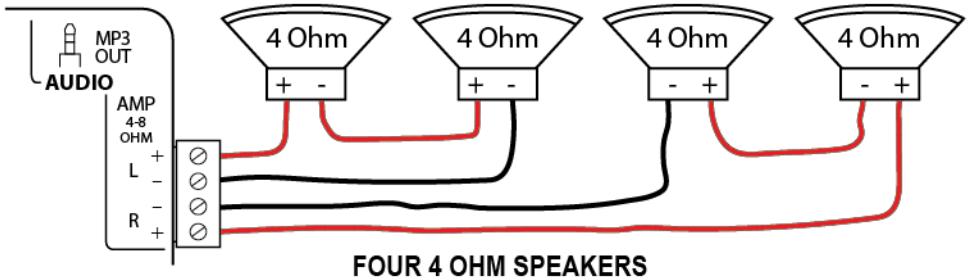
Use the speaker outputs to play sound through non-powered speakers. Use the volume knob to adjust the volume. If you are going to be turning it loud you may need a power supply with more current than the default 1A supply. See Power Supply Requirements for more information on selecting the correct power supply for your application.



TWO 4 OR 8 OHM SPEAKERS



FOUR 8 OHM SPEAKERS



FOUR 4 OHM SPEAKERS

Puzzle Modes in Depth

Input Sequence

This mode forces the players to match a particular sequence you recorded. This can be done by pressing buttons, moving objects onto sensors, triggering light sensors, etc. The most basic use of this mode would be to enforce a simple sequence of inputs such as 1 2 3 4 5 6, or 1 2 1 3 1 1 4, etc.

More complex sequences where some buttons are held down while others are pressed are also possible. For example: tap 1, hold 2, while holding 2 tap 3,4,5, then let go of 2.

By default, the EscapeKeeper will only indicate when the sequence was entered correctly, it will never declare the sequence was wrong (a miss). If you want to play miss sounds, miss animation on the outputs, or limit the number of attempts, you have to tell the EscapeKeeper when to do that. See the Input Sequence Options for more information on what can be declared a miss.

Sounds

With the EscapeKeeper model, each input can play a different sound. You can also play sounds at any point in the sequence. For example, you can play a sound representing a correct press, and nothing for a bad press, or vice-versa, forcing them to piece the code together by process of elimination. You can also play specific sounds at certain points in the sequence, for example if they correctly press the 5th button in a 6 step sequence.

Morse Code

Similar to Input Sequence except with a distinction between short and long presses. This can be used with a single input to force players to enter a Morse code sequence, or with multiple inputs to create a more complex input sequence.

A short and long press will differ from player to player. The EscapeKeeper dynamically adjusts the short/long press threshold at each attempt. The input number and hold length of each press is recorded. Once they've entered the correct number of inputs each press is categorized as short or long based on the lengths of the presses in that attempt. If the input number and length matches that of the recorded solution the puzzle is solved.

Input State Match

Use this mode if you want the players to figure out what state the inputs should be in to solve the puzzle. This mode compares the on/off states of each puzzle input to make sure they match the solution. For example, you could use a bunch of toggle switches, knobs, objects with sensors, etc. Once the EscapeKeepers sees the inputs matches your solution it will declare success.

To make sure the attempt is intentional it does make sure the state is held for at least 1 second before it will declare success. This prevents brute force attacks on certain puzzles where the players could quickly change the state by spinning wheels or flipping switches instead of making an intentional guess.

Unlike Input Sequence and Morse Code, it's not possible for the EscapeKeeper to reliably determine when the players have made an attempt at the solution. This is a problem if you want to play Miss sounds or enforce a certain number of attempts at the solution. To get around this we've added the option of a submit button on Input 8. The players can then setup their guess on the first 7 inputs and submit it by pressing a button connected to input 8. That will register their guess so the EscapeKeeper can declare it a Miss or Success.

Number of Inputs

Some puzzles require the players to find a certain number of objects. These could be keys, body parts, objects with magnets or RFID tags in them, etc. It doesn't matter what order they find them in, just how many they find. This mode will declare success when all your selected inputs have been turned on.

Sounds

In addition to the usual input sounds, the EscapeKeeper can play sounds as they activate additional inputs. For example, each time they find another object, or only when they find a specific number of objects. See the PROGRESS folder for more information on using progress sounds. The progress sounds will only play once per game. If they remove an object and replace it the progress sound will NOT be repeated.

Mission Impossible

This mode was designed for laser mazes where players have to get from one end to the other without breaking one of the lasers, moving the wrong object, stepping on a booby-trapped tile, etc.

Inputs 1 & 2 are dedicated to start and win buttons. The rest of the inputs are dedicated to booby sensors. The start button would be located at the beginning of the challenge, the win button at the end. The object of the challenge is to press the start button, get though the booby traps successfully, then press the win button. The win button could optionally be replaced with a keypad to add another level of complexity. If they hit one of the booby traps the win button is disabled, they have to go back to the beginning and press the start button to re-enable it.

This mode was envisioned to use illuminated start and win pushbuttons, or buttons paired with some other visual indication. Outputs 2 & 3 are repurposed to control these pushbutton lights in this mode.

Below is an example of a typical game:

1. As the players enter the room they see a start button flashing.
2. They press the start button, the win button (Unlock button?) at the other end of the room illuminates.
3. They proceed through the maze but trip one of the lasers. The win button light turns off indicating it's been disabled, the start button begins flashing again to indicate they must go back to the beginning and restart.
4. Once the start button is pressed again the win button lights back up and they can try again.
5. If they make it all the way to the win button without tripping one of the booby traps they succeed.

With multiple players present cheating would be easy. One player could stay back at the start button while another remains in the maze to trigger the next booby trap. You could limit the number of attempts to help minimize this. In the end, it's up to the players if they want to solve the puzzle honestly instead of cheating.

Selecting your Puzzle Mode and Setup Options

Entering the Setup Menu

Power up holding button 3 to enter setup mode. You can let go when the MODE light starts flashing blue. The current puzzle mode selection will be shown on the yellow LEDs. If you just want to browse through your settings without changing anything you can keep tapping 3 to advance to the next setting. If you want to change any of the settings use the volume knob.

You must advance through all the settings for any changes to be saved. Which also means if you want to abort and return to your previous settings you can just unplug.

Selecting your Settings

INITIAL SETUP STEPS	
Mode LED	**Setting Description and Options**
 x1	**Puzzle Mode** The puzzle mode defines how the EscapeKeeper monitors the puzzle inputs and when it declares the puzzle has been solved. See Puzzle Modes in Depth for more information. 1 2 3 4 5 6 7 8 **Input Sequence** Players must activate the inputs in a specific sequence to solve the puzzle. 1 2 3 4 5 6 7 8 **Morse Code** Players must match your sequence of short and long presses. 1 2 3 4 5 6 7 8 **Input State Match** Players must match the inputs to a recorded input state. By default, success is declared if the inputs match your recorded state for 1 second. You can optionally use a submit button so they have to submit their guess. This way you can play Miss sounds and optionally limit the number of attempts. 1 2 3 4 5 6 7 8 **Number of Inputs** Players must activate a certain number of inputs. Set that number in the next step *Number of Puzzle Inputs*. 1 2 3 4 5 6 7 8 **Mission Impossible** Players must navigate through a laser field or other booby traps to trigger a win input at the other side. If they hit a trap they must return to the beginning to trigger the start input before they can try again.
 x2	**Number of Puzzle Inputs** Number of buttons, switches, or sensors used for the puzzle. Remaining inputs can optionally be used to play sounds or hints but should not be included in the count. 1 2 3 4 5 6 7 8 Use the knob to turn on the LED that represents the number of inputs used in your puzzle.

x3

Output 1 Mode

Output 1 is dedicated to indicating the puzzle has been solved. Often this is done by releasing a maglock, turning something on, or by pulsing a solenoid latch.

Maglock, NO E-Stop Detection, Unlock on Failure
Use this mode if you want a maglock to release on success. An E-Stop button can be used but the EscapeKeeper will not stop the game if it's pressed. The lock will be unlocked if the Game Timer expires or they've run out of attempts.

Maglock, E-Stop Detection, Unlock on Failure
Use this mode if you want a maglock to release on success. If the current through the maglock stops, usually because an E-Stop button is pressed, the EscapeKeeper will stop the game and start beeping. The lock will be unlocked if the Game Timer expires or they've run out of attempts.

Maglock, NO E-Stop Detection
Use this mode if you want a maglock to release on success. An E-Stop button can be used but the EscapeKeeper will not stop the game if it's pressed. The lock will remain locked if the Game Timer expires or they've run out of attempts.

Maglock, E-Stop Detection
Use this mode if you want a maglock to release on success. If the current through the maglock stops, usually because an E-Stop button is pressed, the EscapeKeeper will stop the game and start beeping. The lock will remain locked if the Game Timer expires or they've run out of attempts.

Pulse On
Output will turn on for 1 second if the puzzle is solved. This mode is often used to pulse a solenoid latch or to notify a master controller the puzzle has been solved.

Turn On
Output will turn on and stay on if the puzzle is solved. Often used to turn on a light or provide power or indication to the next puzzle.

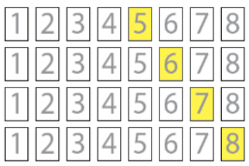
Link Mode
Use this mode if Output 1 is connected to another EscapeKeeper's Reset input. This will force this puzzle to be solved before the next one can be played.

x4

Auto-Reset Timer

This timer starts when the puzzle is solved or fails due to timeout or too many attempts. When it expires it restarts the puzzle allowing it to be solved again.

Off
After Sound
5 sec
15 sec



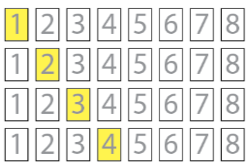
30 sec
1 min
2 min
5 min

10 min
15 min
30 min
60 min

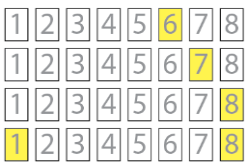
x5

Game Timer

Used to automatically fail the game if the players can't solve the puzzle before the timer expires.



Off
1 min
2 min
3 min
4 min



5 min
10 min
15 min
20 min
30 min

40 min
50 min
60 min

Puzzle Specific Options

If your MODE light has turned off your setup is complete. If it starts blinking green there are a few more settings specific to your puzzle mode. Continue your setup using the appropriate table for your puzzle mode.

Note that if you enabled the Auto-Reset timer the unit may immediately enter game mode, which is also a green blinking light but at a different rate. If your selected puzzle mode isn't listed below that's what happened.

Jump to Puzzle Specific Options for …
Input Sequence & Morse Code
Input State Match

Puzzle Specific Options - Input Sequence & Morse Code

These options are only shown if you selected the Input Sequence or Morse Code puzzle mode.

Miss Indication

A *Miss* is an incorrect attempt at the puzzle's solution. By default, the Input Sequence and Morse Code puzzle modes will never indicate a miss, they only indicate success. Some of the options below allow you to specify when the EscapeKeeper should declare a Miss has occurred.

ON/OFF	In On/Off options you'll see one of the lights flash quickly, this is the cursor position. The cursor can be moved left or right by turning the knob. If you want to toggle one of the options on or off, move the cursor to that position, then tap the red REC button. When you are finished toggling all the options and are ready to move on to the next step tap button 3.

ONLY FOR INPUT SEQUENCE & MORSE CODE PUZZLE MODES	
Mode LED	**Setting Description and Options**
 x1	**Miss on Input Timeout** Use this to limit the maximum number of seconds between inputs in the sequence. This option will declare the current attempt a miss and play any miss sound and animation if they take too long to activate the next input, button, etc. 1 2 3 4 5 6 7 8 **No Timeout** There's no limit to how long they can take between inputs in the sequence. 1 2 3 4 5 6 7 8 **Timeout** Number of seconds until the current attempt times out (2 shown) and is declared a miss. Move the selection between 2 and 8 to set a timeout between 2 and 8 seconds.
 x2	**Options** ON/OFF In this step each of the options below can individually be toggled off or on. See the ON/OFF icon above for more information as these are set a little differently than previous settings. 1 2 3 4 5 6 7 8 **Miss at Code Length** The attempt will miss when the number of input entries (usually button presses) in their attempt matches the amount in your solution. For example, if you recorded a solution that consisted of 6 button presses, as soon as they press any 6 buttons their attempt will immediately be declared a miss. This will obviously tip them off to the length of the code if you have miss sound or animation. 1 2 3 4 5 6 7 8 **Miss on Bad Input** The current attempt will be declared a miss as soon as they make a mistake anywhere in the sequence. This would allow the players to slowly figure out the code by trial and error. Note that this option will NOT play miss sounds in the Morse Code mode. More options on the next page…

	1 2 3 4 5 6 7 8	**Pulse Output 2 for each Keypress** With this enabled output 2 will pulse to indicate the EscapeKeeper registered a keypress. It would usually be connected to a light of some kind to give players visual feedback their press was registered. Note that it will only pulse output 2 when a game is in progress, not before the puzzle has been started or after it's been solved. Also, with this option enabled output 2 will no longer indicate fail status or play output animation.

Puzzle Specific Options – Input State Match

These options are only shown if you selected the Input State Match puzzle mode.

ON/OFF	In On/Off options you'll see one of the lights flash quickly, this is the cursor position. The cursor can be moved left or right by turning the knob. If you want to toggle one of the options on or off, move the cursor to that position, then tap the red REC button. When you are finished toggling all the options and are ready to move on to the next step tap button 3.

ONLY FOR INPUT STATE MATCH	
Mode LED	**Setting Description and Options**
 x1	**Options** ON/OFF In this step each of the options below can individually be toggled off or on. See the ON/OFF icon above for more information as these are set a little differently than previous settings. Currently there is only one option so the cursor won't move left and right. 1 2 3 4 5 6 7 8 **Use Submit Button** Instead of having the puzzle succeed once they've matched the input state and kept it there for 1 second, you can require them to also press a button. This submission enables the EscapeKeeper to declare the attempt a "miss" if they've guessed incorrectly. This allows you to play a miss sound effect or animation, and also gives you the option of limiting the number of attempts. Connect the submit button to input 8, or 7 if puzzle bypass is enabled. The button should not be included in the count for "Number of Puzzle Inputs".

Factory Reset

Power up holding both the black 2 & 3 buttons. Let go when the REC LED starts flashing red. If you have been using a Micro SD card with your EscapeKeeper make sure it's inserted when you do this, otherwise the settings from the card will be loaded next time the card is inserted. The sounds on the card will NOT be deleted.

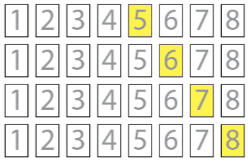
Advanced Options

Entering the Advanced Menu

Power up holding button 3 to enter setup mode. You can let go when the MODE light starts flashing blue. Hold button 2 until the mode light starts flashing yellow. You are now in the Advanced Options menu.

Advanced Options

ON/OFF	In On/Off options you'll see one of the lights flash quickly, this is the cursor position. The cursor can be moved left or right by turning the knob. If you want to toggle one of the options on or off, move the cursor to that position, then tap the red REC button. When you are finished toggling all the options and are ready to move on to the next step tap button 3.

ADVANCED OPTIONS	
Mode LED	**Setting Description and Options**
 x1	**Maximum Attempts at Solution** Use this to limit the maximum number of incorrect guesses (Misses) the players can make at the solution. If they hit the limit the EscapeKeeper will immediately go into a failed state and remain there until it's reset by auto-reset, the reset input, or Button 3.  **Unlimited** **2 Tries** **3 Tries** **4 Tries**  **5 Tries** **10 Tries** **15 Tries** **20 Tries**  **25 Tries** **30 Tries** **1 Try**
 x2	**Options** ON/OFF In this step each of the options below can individually be toggled off or on. See the ON/OFF icon above for more information as these are set a little differently than previous settings.  **Puzzle Write Protection** Toggle the 1 LED on if you want the puzzle solution to be write-protected.  **Animation Write Protection** Toggle the 2 LED on if you want the animation scenes to be write-protected.  **Puzzle Bypass** Toggle the 3 LED on if you want input 8 to be used as a puzzle bypass so you can manually force the controller into the success state.

x3

Normally Closed Inputs

ON/OFF

In puzzle modes other than Input State Match you usually want the game to start with all the inputs off. If you have a sensor or switch that keeps the EscapeKeeper's input on by default you can tell the EscapeKeeper to invert that input by setting it to Normally-Closed.

1 2 3 4 5 6 7 8 **N.C. Inputs**
Each light represents the normally-closed status of the corresponding input.

x4

Input Bounce Filter

ON/OFF

This option will tell the EscapeKeeper to ignore short off durations for the enabled inputs.
This is useful for some RFID and proximity sensor setups. As an RFID tag or magnet approaches the sensor the sensor can turn off and on a few times. Also in some RFID setups, depending on the tag's final distance from the sensor, the relay can even chatter occasionally as it sits in the correct position.

This option can be enabled on a per-input basis. Enabling it tells the EscapeKeeper to pretend it doesn't see those short off durations. It will only declare the input off if it's off for more than a second. Without this enabled, each click of the relay becomes another entry in an Input Sequence, making it nearly impossible to use RFID and proximity sensors in an input sequences.

1 2 3 4 5 6 7 8 **Bounce-Filtered Inputs**
Each light represents the bounce-filter status of the corresponding input.

Recording the Solution

If you selected the Input Sequence or Morse Code puzzle mode, you need to teach the EscapeKeeper the solution to the puzzle. If you selected Input State Match you'll need to teach it the winning input state. Other modes not mentioned do not require a solution be recorded.

Input Sequence & Morse Code

1. If you previously recorded one of the animation scenes since you last powered up, you must re-select the solution for recording. See *Selecting the Solution* below.
2. Tap REC to start the recording process, the light above the red button should turn red.
3. Trigger the EscapeKeeper's inputs by pushing the buttons or activating the sensors as the players would if they solved the puzzle correctly.
4. Tap REC again to save.
5. Tap button 3 to start the puzzle, then test the solution is correct by acting it out once more.

Input State Match

1. If you previously recorded one of the animation scenes since you last powered up, you must re-select the solution for recording. See *Selecting the Solution* below.
2. Set the inputs to the winning state by activating the appropriate sensors, turning on the appropriate switches, rotating the appropriate dials, etc.
3. Tap the red REC button to save the current input state as the solution. The light above the record button should flash red. The solution is now saved.
4. Reset all the inputs back to the reset state as if you were resetting the game.
5. Tap button 3 to start the puzzle, then test the solution is correct by setting the inputs back to the winning state.

Selecting the Solution

1. Hold the REC button for a few seconds until the light above it turns blue.
2. While still holding the button, turn the Volume/Adjust knob to select the Puzzle Solution mode.
3. Let go of the REC button. From now on when you tap REC you will be recording the puzzle's solution.

TEACHABLE SOLUTIONS	
1 2 3 4 5 6 7 8	**Puzzle Solution** The default after power-up. Records the puzzle solution for Input Sequence and Morse code, or the winning state for Input State Match.
1 2 3 4 5 6 7 8	**Master Code** Not implemented yet. Coming in a future firmware update. Master code for Input Sequence and Custom Keypad.

Recording Output Animation

By default, outputs 2 and 3 indicate the pass / fail status of the puzzle. If you'd like, you can create different scenes of output animation that will be played in the puzzle's different states. See *Selecting a Scene* below for the list of available scenes .

NOTE: If ANY of the available scenes contain custom animation, outputs 2 & 3 will no longer indicate pass / fail status.

Selecting a Scene

1. Hold the REC button for a few seconds until the light above it turns blue.
2. While still holding the REC button, turn the Volume/Adjust knob to select one of the animation scenes in the table below.
3. Let go of the REC button. From now on when you tap REC you will be recording that scene.

ANIMATION SCENES AVAILABLE FOR RECORDING	
1 2 **3** 4 5 6 7 8	**Game Start** This animation plays when the game is started. If an MP3 file is in the START folder, that sound will play along with this scene.
1 2 3 **4** 5 6 7 8	**Game Loop** This animation will loop as the game is running. If one or more MP3s are in the GAMEON folder, those sounds will play as the animation loops.
1 2 3 4 **5** 6 7 8	**Miss** This animation plays when an incorrect attempt is made. If one or more MP3s are in the MISS folder, one of those sounds will play along with this scene. Note that this scene will ONLY be played if your puzzle supports misses. For Input Sequence and Morse Code puzzle modes, one of the Miss options must be enabled. For Input State Match, a submit button must be used.
1 2 3 4 5 **6** 7 8	**Success** This animation plays when the puzzle is solved. If an MP3 file is in the SUCCESS folder, that sound will play along with this scene.
1 2 3 4 5 6 **7** 8	**Failed** This animation plays when the optional game timer expires or the players run out of attempts to solve the puzzle. If an MP3 file is in the FAILED folder, that sound will play along with this scene.

Recording Animation

1. Tap the red REC button to start recording. The light above the REC button should turn red. If there is a sound in the scene you selected, it should begin playing.
2. Use the 2 & 3 buttons to control the outputs. Anything you do with those outputs will be recorded.
3. When you're done, tap REC again to save your recording.
4. Tap button 3 if you'd like to preview the scene you just recorded.
5. If you'd like to record again start back at step 1.
6. When you're ready to exit record mode and start the puzzle hold button 3 for a few seconds.

Scene Recording Tip

- If you'd like an output to remain on after the animation is played make sure you are still holding the output button when you stop recording. This is useful if you want an output to stay on after the animation has finished playing.

Erasing a Scene's Animation

Select the scene for recording then tap record twice quickly.

How Much Animation can be Stored

The length of animation that can be stored in each scene varies with the activity on the outputs. The most you can get is 35 minutes per scene, but that's if the outputs only change state a few times. If you are constantly mashing on the output buttons it could be as little as a few minutes.

Which Scenes Currently Contain Output Animation

During the boot sequence the mode LED will change color a few times. It starts green, then turns yellow to show the version number, then if there are animation scenes it will turn red and show which scenes currently have animation on the input LEDs.

Adding Sounds (EscapeKeeper Only)

Sounds and the EscapeKeeper

You can have sounds play for pretty much every situation. When an input turns on or off, when the puzzle is solved, when the time runs out, etc. The EscapeKeeper will create a list of possible sound folders on the Micro SD card the first time it's inserted. Each folder represents a different state of the puzzle. If you want a sound to play for any of those states just drag an MP3 into the folder.

Creating your Sound Folders

There's no need to create the folders manually. When you first insert the SD card into the controller the mode light will turn red during the bootup sequence as it creates the folder structure. When that's done you can eject the card and put it in a computer to see the list of folders.

Sound Folder List

Inside each folder is a short README.TXT file explaining when sounds in that folder will play and how the files should be named. The contents of those files are shown in the table below.

ESTOP Any MP3 in here will play when an E-Stop event has been detected.

START Any MP3 in here plays when the game starts.

GAMEON You can put as many MP3s in here as you want. They will play during the game. If you need them to play in order, name them with a three digit filename starting with 001.

For example:
001.MP3 plays first.
002.MP3 plays second.

MISS Any MP3 in here will play when a failed attempt to solve a puzzle is detected. If you want to play a specific sound based on how many times they've failed, use a two digit number for the filename.

For this option to work in the Input Sequence or Morse Code puzzle modes one of the Miss options must be enabled.

For this option to work in the Input State Match puzzle mode, the Use Submit Button option must be enabled. It will not work in Number of Inputs puzzle mode.

For example:
01.MP3 plays after the first failed attempt.
10.MP3 plays after the tenth failed attempt.

SUCCESS Any MP3 in here plays once the puzzle is solved.

FAILED Any MP3 in here plays when they fail to solve the puzzle. This can only occur if you have set the Game Timer or Maximum Number of Tries.

PROGRESS Any MP3 in here will play as they make progress towards the solution. This works with the Number of Inputs puzzle mode, as well as Input Sequence & Morse Code, IF Fail on Bad Input is enabled.

You can use numbered filenames if you want to play specific sounds for each step. You only need to include sound files for the steps you want to hear sounds for.

In Number of Inputs puzzle mode, the next sound plays when the number of inputs turned on increases:

01.MP3 plays when one input turns on.
04.MP3 plays after the fourth input turns on.

In Input Sequence and Morse Code modes, a progress sound will play as they progress through the sequence. Note that a button press is TWO steps in the sequence, one step is the press, one is the release:

01.MP3 plays when the first correct button is pressed.
02.MP3 plays when that button is released.
03.MP3 plays when the next correct button is pressed.

ERROR Any MP3 in here plays when there was an error resetting the puzzle.

IN1ON
IN2ON
etc. Any MP3 in here plays when the input first turns on. Create an empty folder named _MOM if you want the sound to stop playing immediately when the input turns off. Don't put the sound in it, just leave it empty.

IN1OFF
IN2OFF
etc. Any MP3 in here plays when this input turns off.

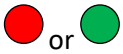
TIMELEFT Used when Game Timer is enabled. Name your sounds with a two digit number representing the number of minutes remaining when you want them to play. Do not use a 00 file for time expired, use the FAILED folder.

For example:
15.MP3 plays at 15 minutes remaining.
05.MP3 plays at 5 minutes remaining.

Operation

Boot Sequence

As the EscapeKeeper boots up it displays some useful information on the Mode and Input LEDs.

BOOT SEQUENCE	
Mode LED	**Boot Sequence Step**
	**Step 1 - Firmware Check** The Mode LED will turn green for a few seconds as it validates the installed firmware. If it detects a new firmware version on the SD card it will start flashing as it updates the firmware. Firmware updates take about 90 seconds.
	**Step 2 - Current Version Display** When the mode LED turns yellow the EscapeKeeper will indicate the current firmware version on the eight input LEDs. It will show two patterns. If it turns on the 1 LED, followed by the 2 & 3 LEDs, that would be version 1.23. If it flashes the 2 LED followed by just the 5 LED, that would be version 2.05.
 optional	**Step 3 – Folder Creation and Memory Sync** The Mode LED may or may not turn red at this point. If it does it's busy creating folders on the SD card, updating README files, or syncing files on the SD card to internal memory.
	**Step 4 – Puzzle Mode** The Mode LED will turn blue and indicate the current puzzle mode on the Input LEDs.
REC LED 	**Step 5 – Recorded Scene Indication** The REC LED above the REC button will turn red or green and the input LEDs will indicate scenes with valid animation. Refer to the Recording Animation section to see which scene each input LED represents. If the REC LED turns green the animation is write-protected. If it turns red the animation is NOT write-protected.

Operating States

1. Idle

In Idle mode the EscapeKeeper will wait for the game to be started. This can be done by tapping button 3 or by pulsing the Reset input. If the EscapeKeeper sees one of the inputs isn't ready for the game to start it will beep, blink the mode LED red and indicate which input is the problem. Once that issue is resolved you can attempt the reset again.

If the unit just powered up the Mode LED will be off, unless Auto-Reset is enabled, in which case it will start the game immediately.

If the game was previously played the Mode LED will indicate the pass (green) or fail (red) state of that game. If the auto-reset time is counting down you will also see a brief yellow flash.

2. Game On

During the game, the Mode LED will blink green. The game can be stopped and the door unlocked by tapping button 3 once, or the reset input twice.

3A. Success

The mode light will turn solid green to indicate the puzzle is in the success state. It will then return to Idle mode and start the Auto-Reset timer if it's enabled.

3B. Failure

The mode light will turn solid red to indicate the puzzle is in the failed state. It will then return to Idle mode and start the Auto-Reset timer if it's enabled.

Trouble Shooting

Error Codes

If the Mode LED blinks red continuously then it's displaying an error code on the input LEDs. See the table below for the meaning of the code.

ERROR CODES	
Which Input LEDS are Flashing	**Error Description**
3	**Output 1 Current Limit Exceeded** A current higher than 2.5 amps was detected.
4	**Firmware Update Required** The EscapeKeeper is trying to interpret a saved file that was saved by a future version of the firmware. You need to update the firmware on this unit.
5	**Internal Memory Error** There was an error syncing an SD card file with internal memory. Try a factory reset.
7 & any	**SD Card Error** There was an error reading or writing to the SD card, or the card is formatted in a way the EscapeKeeper can't understand.
8 & any	**Bootloader Error** The boot loader detected an error and can't recover. Email us the error.
7,8 & any	**SD Card Error in the Bootloader** There was an error reading or writing to the SD card while in the Bootloader.