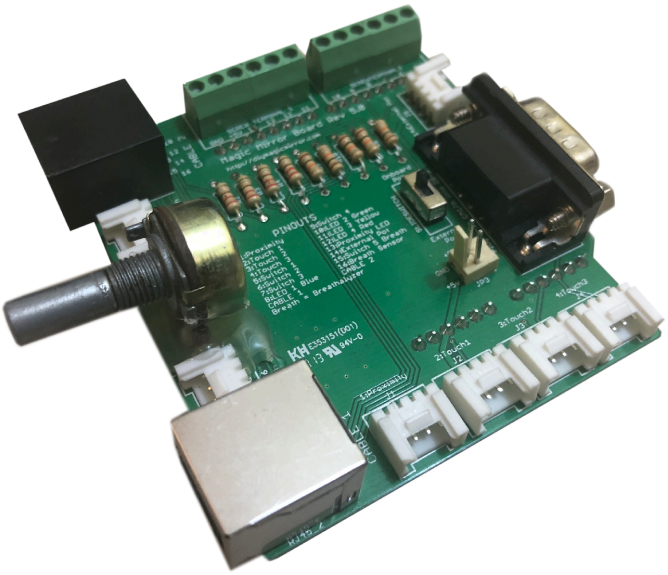
DIY Magic Mirror

Sensor Wiring & Software Operations Manual

Version 7.8



Copyright © Open Gadgets LLC

Contents

Chapter 1

Part List

See http://diymagicmirror.com/hardware.html for recommended places to buy the parts.

Part	Qty	Description
PC	1	Your PC will be fine if it can play the videos on http://diymagicmirror.com/v3/mirrordemo.html smoothly
Monitor	1	Used 15" LCD monitor on Craigslist or eBay. You can use a larger monitor also.
Magic Mirror Sensor Hub	1	You can build your own or purchase one. See the manual "Building the Magic Mirror Sensor Hub" for instructions on how to build your own. The Magic Mirror Software is included with the Sensor Hub purchase.
Magic Mirror Software	1	Magic Mirror Software
Picture Frame with Oval Matte – OPTIONAL	1	Antique shops are good places to find a vintage frame. You'll want to make sure it covers the monitor and wall opening if you recess the monitor in your wall.
Dielectric Glass TV Mirror 4mm (2-Way Mirror) – OPTIONAL	1	Looks like a normal mirror when the monitor is off. Hiddentelevison.com is one source and has low cost samples for smaller monitor/frame sizes (15").
Maxbotix Proximity Sensor LV-EZ1	1	A sensor hooked up to the Magic Mirror Sensor Hub that measures distance using sonar.
Touch Sensors (Up to 3)	3	Sensors that goes off when you touch them.
Switches (Up to 5)	5	See http://diymagicmirror.com/sensors.html for switch options

Part	Qty	Description
Alcohol Sensor	1	Alcohol Sensor for the Breathalyzer Feature
X-10 Plug-in RF Base – OPTIONAL	1	Receives the X-10 commands over RF from the Sensor Hub.
X-10 Firecracker CM17A – OPTIONAL	1	Plugs into the Magic Mirror Sensor Hub, sends X-10 RF commands to the X-10 Plug-in RF Base
X-10 LM465 Lamp Module or X-10 WS467 Wall Switch – OPTIONAL	1	For the X-10 lighting control feature. Plug a lamp into the LM465 replace an existing light switch with the WS467 for an in-wall installation. Note:
X-10 Appliance Module AM466 – OPTIONAL	1	For X-10 On/Off control feature. Plug any device into the appliance module.
LEDs – OPTIONAL	5	Use 4 High Brightness Red LEDs if using for the flickering fire effect. Otherwise, use indicator LEDs of color blue, green, yellow, and red. The 5th LED is the proximity sensor indicator LED and should be the color of your choice.
10K Linear Potentiometer and knob – OPTIONAL	1	10K Linear Potentiometer, mount this externally and wire to the Sensor Hub to change the Magic Mirror character on the fly
Thermostat or Doorbell wire – OPTIONAL	1	Use this wire for an in-wall installation to connect the sensors to the Sensor Hub. You can get 1000 ft spools at your local Home Improvement Store

Chapter 2

Wiring and Testing the Sensors

This chapter assumes you have either built your own or purchased a Magic Mirror Sensor Hub. Refer to the "Building the Magic Mirror Sensor Hub" for instructions on how to build your own.

Running a program called Firmata, the Arduino sends sensor data to a serial server running on the PC. The serial server then passes the data to a local network port that the Magic Mirror software reads. The Magic Mirror software sends commands back to the Arduino for X-10 and LED control.

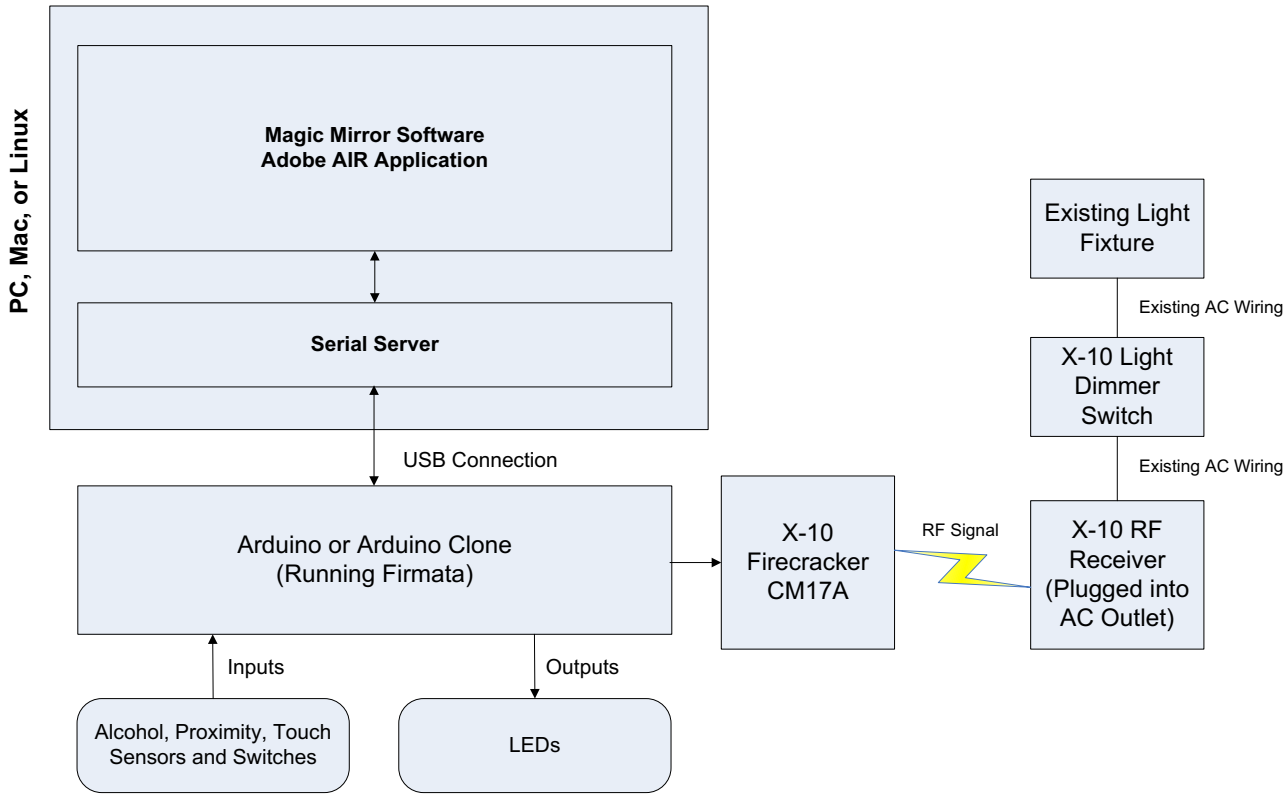
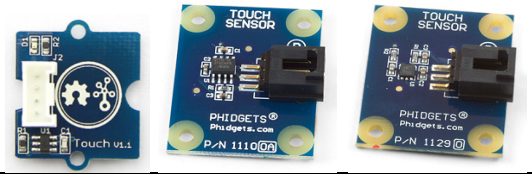
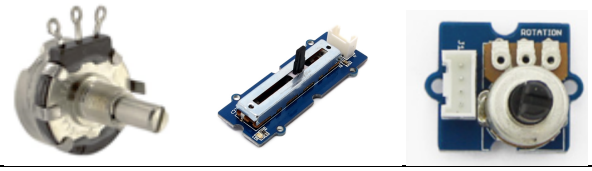


Figure 1 – How the Magic Mirror Works

The Magic Mirror supports 1 proximity (distance) sensor, up to 3 Phidgets Touch Sensors, 1 Alcohol Sensor (Breathalyzer feature), 1 Potentiometer (for changing the character), and up to 5 on/off switches (toggle or momentary).

Note the current Magic Mirror hardware uses the SeeedStudio Grove sensors (4-pin) and not the 3-pin sensors shown in these pictures.

Sensor	Magic Mirror Function(s)	Sensor Picture
Alochol Sensor (1) – From left to right: Seeedstudio alcohol sensor MQ-5 (recommended), Sparkfun MQ-3	Breathalyzer	
Proximity Sensor (1) – Maxbotix LV-EV1, a sonar based sensor that measures the distance of objects up to 22 feet	Plays various animations based on the distance the subject is from the sensor	
Touch Sensors (Up to 3) – From left to right: Seeedstudio Touch Sensor, Phidgets 1110, and Phidgets 1129	Weather Forecast, Stock Performance, and X-10 On/Off	
Potentiometer (1) – From left to right: Seeedstduio Pot, Generic Pot	Changes the Magic Mirror character	
Switches (Up to 5) – Any momentary or toggle switch is supported. From left to right: Seeedstudio button, door roller switch, standard light switch, momentary switch, arcade button, reed (magnetic) switch	Doorbell, Weather Forecast, Stock Performance, Picasa Picture Frame, Breathalyzer Trigger	

After assembling the Magic Mirror Kit, connect the sensors and LEDs (optional), refer to Appendix A (Logical View) and Appendix B (Physical View). There are two ways to go on the wiring, using the plug and play connectors and screw terminals or using CAT5 cabling. Using the plug and play connectors and screw terminals will be easier and does not require any soldering as in figure 3. Use CAT5 for long runs or in-wall installations. Also note that the switch pull-down and LED resistors are on the board so just connect directly to the switches and LEDs, no additional resistors are needed.

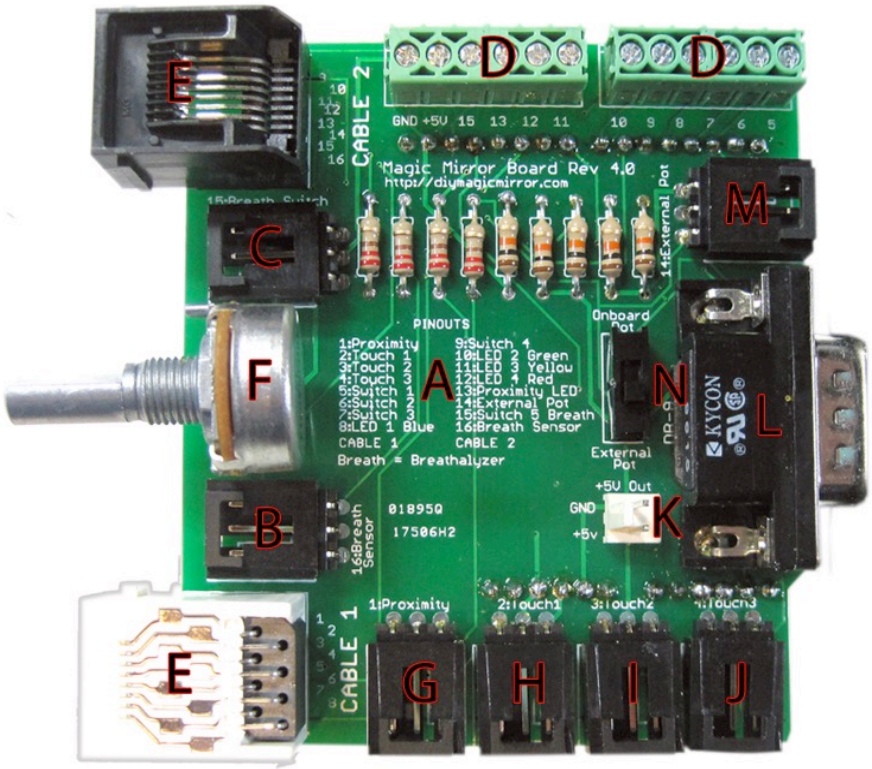


Figure 2 – Magic Mirror Sensor Hub (Arduino Shield)

[A] Sensor Pinout Cheat Sheet
[B] Plug and Play Alcohol Sensor
[C] Plug and Play Breathalyzer Switch
[D] Screw Terminal Sensor Connections
[E] CAT5E Cable Sensor Connections
[F] Onboard Pot – Changes the Character
[G] Proximity Sensor
[H] Plug and Play Switch or Touch Sensor – Weather Forecast
[I] Plug and Play Switch or Touch Sensor – Stock Performance
[J] Plug and Play Switch or Touch Sensor – X10 On/Off Control
[K] +5V and GND Out – Power for Sensors wired to Screw Terminals and/or CAT5E Cables
[L] Connect Optional X-10 CM17A Here
[M] External Pot – Changes the Character
[N] Slide switch to toggle from Internal Pot or External Pot

Note: The Magic Mirror shield is compatible with certain Grove sensors from Seeedstudio.com

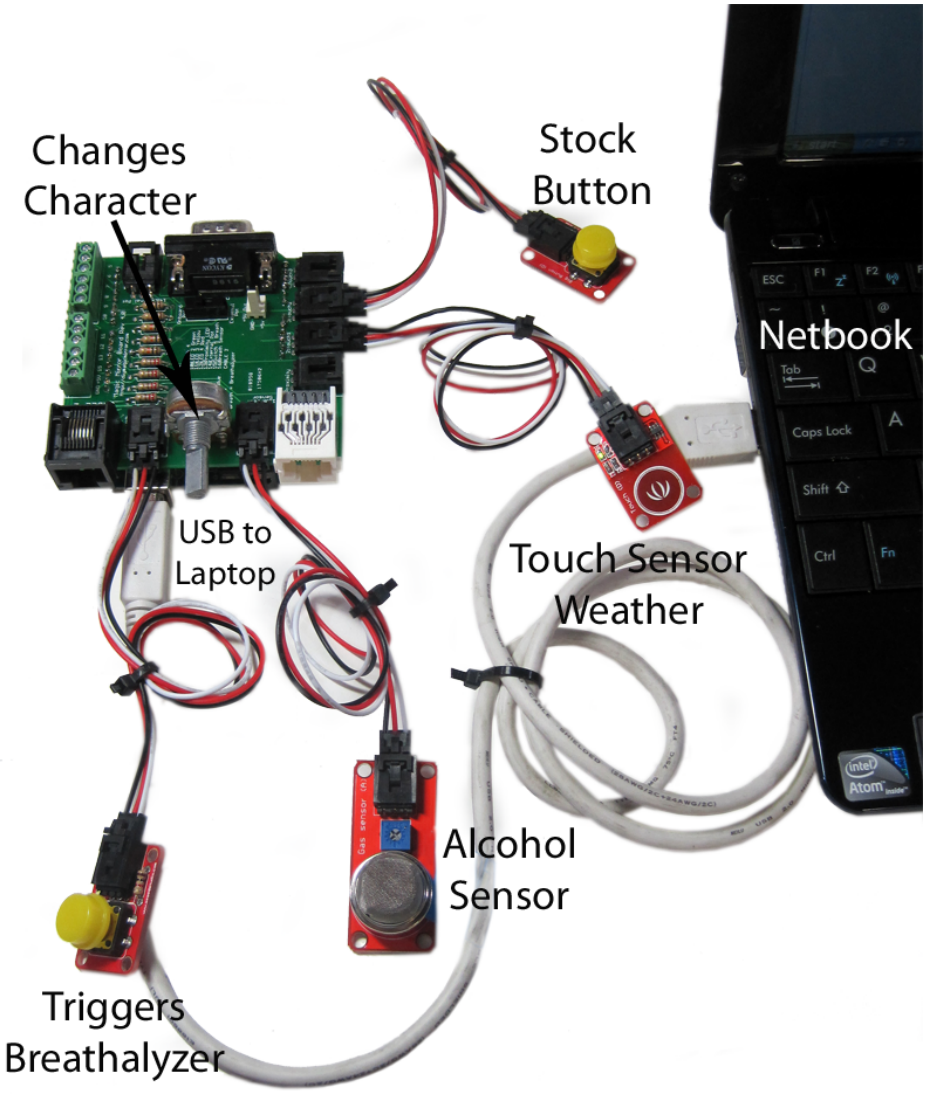


Figure 3 – Plug and Play/No Soldering Setup

Princess Pirate Halloween Insult

Figure 4 – Magic Mirror Characters

If you do go the CAT5 route, be sure that your CAT5 cables use the **T-568B** wiring convention as opposed to T-568A.

Follow the wiring schematic, refer to Appendix A (Logical View) and Appendix B (Physical View), connect the respective Cat5e cable wire to the respective sensor per table below. It's recommended to wire up and test one set of sensors at a time to ease troubleshooting.

Magic Mirror Board Pin Number	Wire Color (Cat5 T568B convention)	Function	Arduino Pin Reference
1	Cable 1 – White w/ Orange	Proximity Sensor	Analog 0
2	Cable 1 – Orange	Touch 1 – Weather Forecast	Analog 5
3	Cable 1 – White w/ Green	Touch 2 – Stock Performance	Analog 2
4	Cable 1 – Blue	Touch 3 – X10 On/Off Control	Analog 3
5	Cable 1 – White w/ Blue	Switch 1 - Door Switch	Digital 2
6	Cable 1 – Green	Switch 2 – Weather Forecast	Digital 3
7	Cable 1 – White w/ Brown	Switch 3 – Stock Performance	Digital 4
8	Cable 1 – Brown	LED 1 – Indicator (Blue) or Fake Fire (Red)	Digital 6
9	Cable 2 – White w/ Orange	Switch 4 – Picasa Slide Show – Slide show will play when this switch is OFF and will stop when this switch is ON	Digital 7
10	Cable 2 – Orange	LED 2 – Indicator (Green) or Fake Fire (Red)	Digital 9
11	Cable 2 – White w/ Green	LED 3 – Indicator (Yellow) or Fake Fire (Red)	Digital 10
12	Cable 2 – Blue	LED 4 – Indicator (Red) or Fake Fire (Red)	Digital 11
13	Cable 2 – White w/ Blue	Proximity LED (Color or your Choice)	Digital 13
14	Cable 2 – Green	External Character Select Pot	Analog 4
15	Cable 2 – White w/ Brown	Switch 5 – Triggers Breathalyzer	Digital 5
16	Cable 2 – Brown	Alcohol Sensor (For Breathalyzer)	Analog 1

Table 1 – Magic Mirror Sensor Hub Pinouts

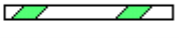
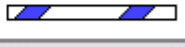
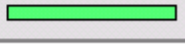
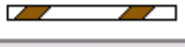
RJ45 Pin #	Wire Color (T568B)	Wire Diagram (T568B)
1	White/Orange	
2	Orange	
3	White/Green	
4	Blue	
5	White/Blue	
6	Green	
7	White/Brown	
8	Brown	

Table 2 – T568B Wiring Convention

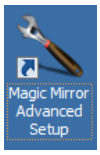
Chapter 3

Software Features

Switches

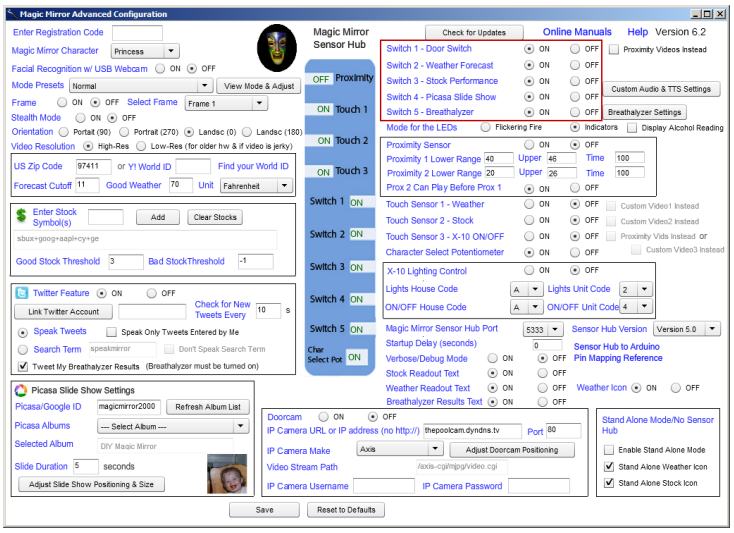
Start by wiring up the digital ON/OFF switches (switches 1-5). These can be toggle switches such as a standard light switch or momentary switches.

Per Appendix A (logical view) and B (physical view), wire the 5 digital switches (switches 1-5) to the Magic Mirror Sensor Hub.

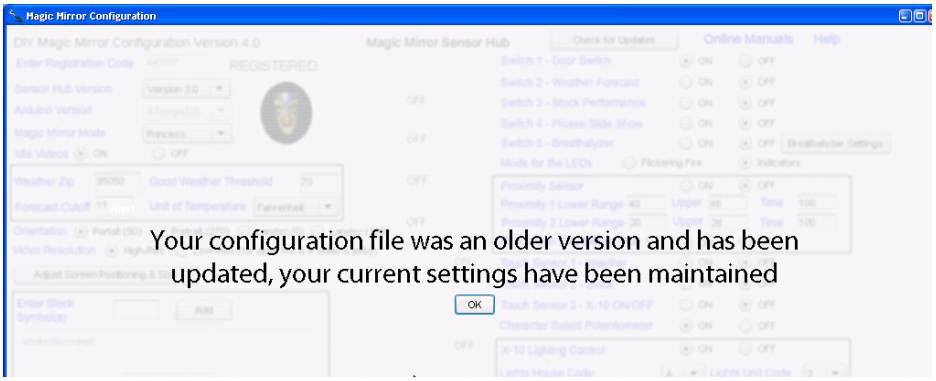
Launch “Magic Mirror Advanced Setup” 

a. Enter the Magic Miror Sensor Hub Port if you haven’t done so yet. If you need to enter the Magic Mirror Sensor Hub Port, it will be 5335 for COM5, 5334 for COM4… on the PC. For Mac and Linux users, the value will always be 5333.

b. Turn on just the digital switches (Switches 1-5) that you have wired up and click < Save >. IMPORTANT: Only turn on the sensors in the configuration screen that are hooked up. If not, the Magic Mirror Sensor Hub will overload the PC with false data causing the program to lock up and potentially crash.



If you get this message, it means your configuration file was an older version and has been upgraded. Your current configuration settings will be maintained so you won't need to re-enter them.

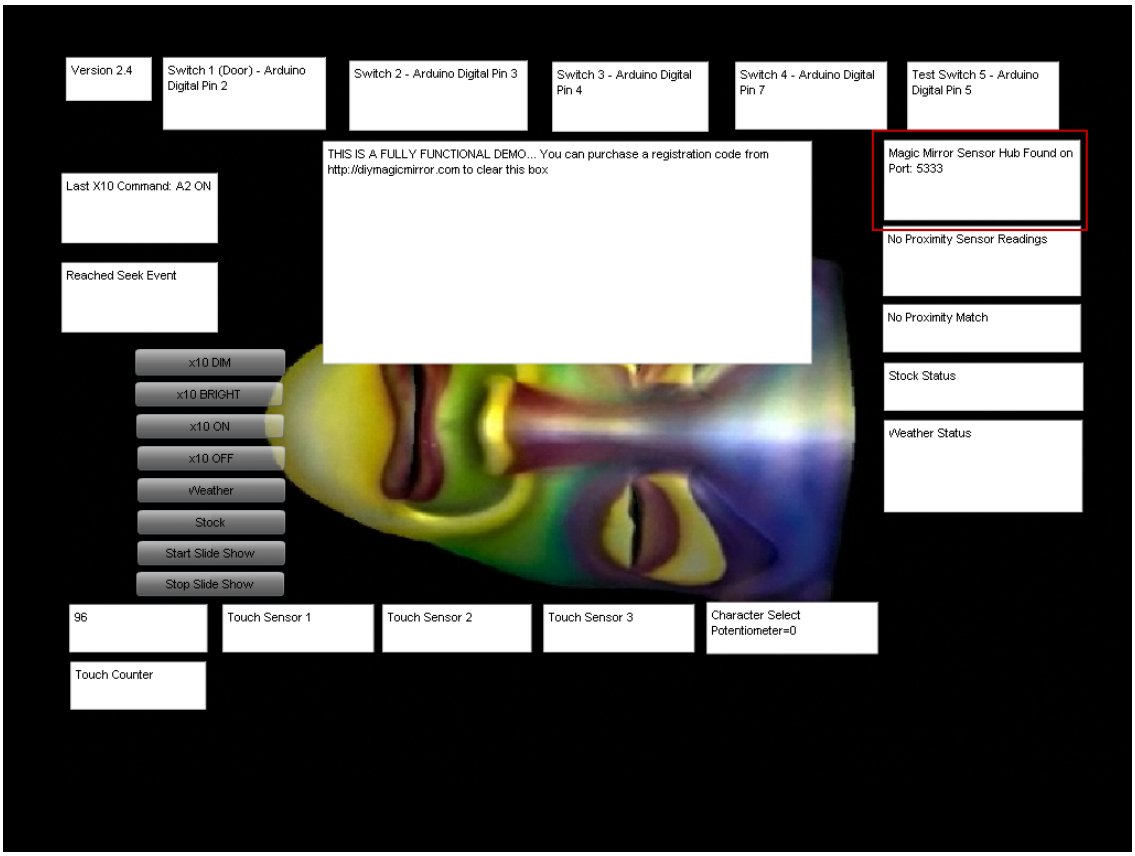


Launch "Run Magic Mirror " 

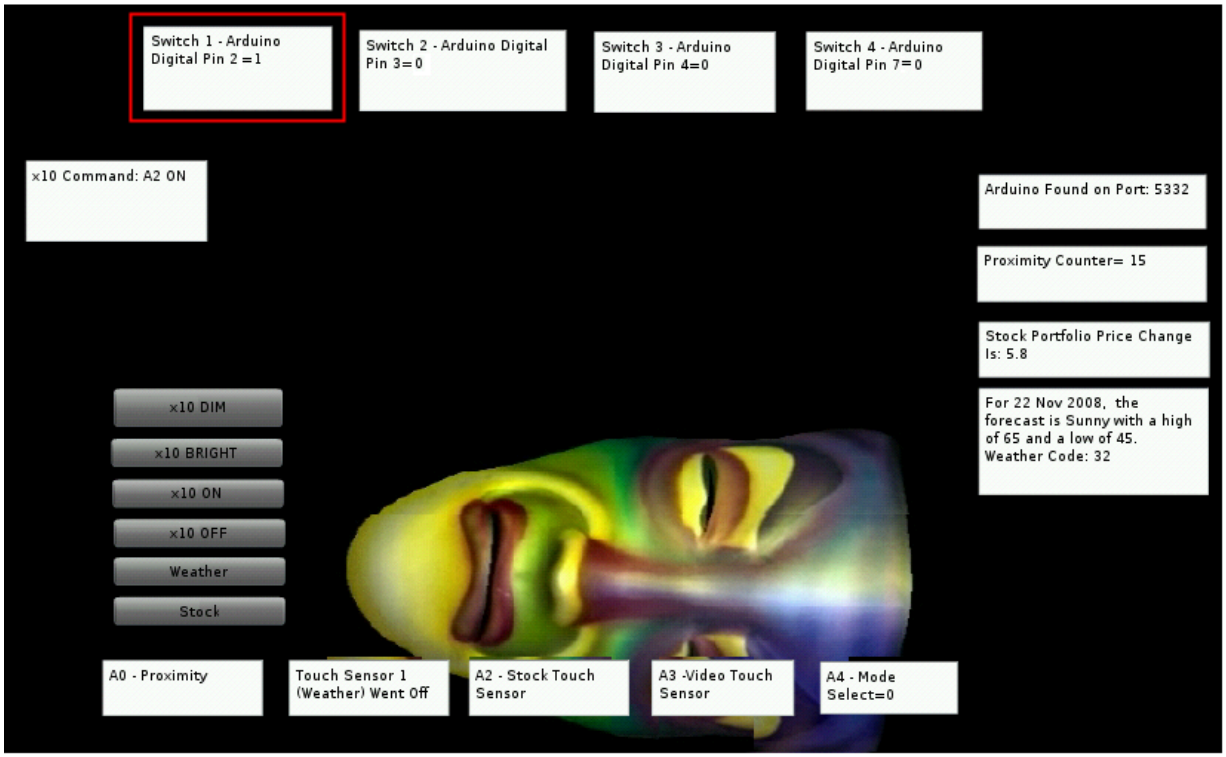
on the PC and "mirror" 

on Mac and Linux.

Verify that the Magic Mirror Sensor Hub was found & the top right box reads "Magic Mirror Sensor Hub Found on Port x". If the Magic Mirror Sensor Hub was not found, ensure that you've entered the correct Sensor Hub port from the "Configure Magic Mirror" program.



Trigger Switch 1 and you will see a “1” flash on the text “Switch 1 – Arduino Digital Pin 2 = 1” and the door video play.



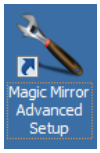
Test the remaining switches that you have wired up and then close.

Note: You don’t have to use all the switches, simply do not turn on the switches that are not wired in the configuration program.

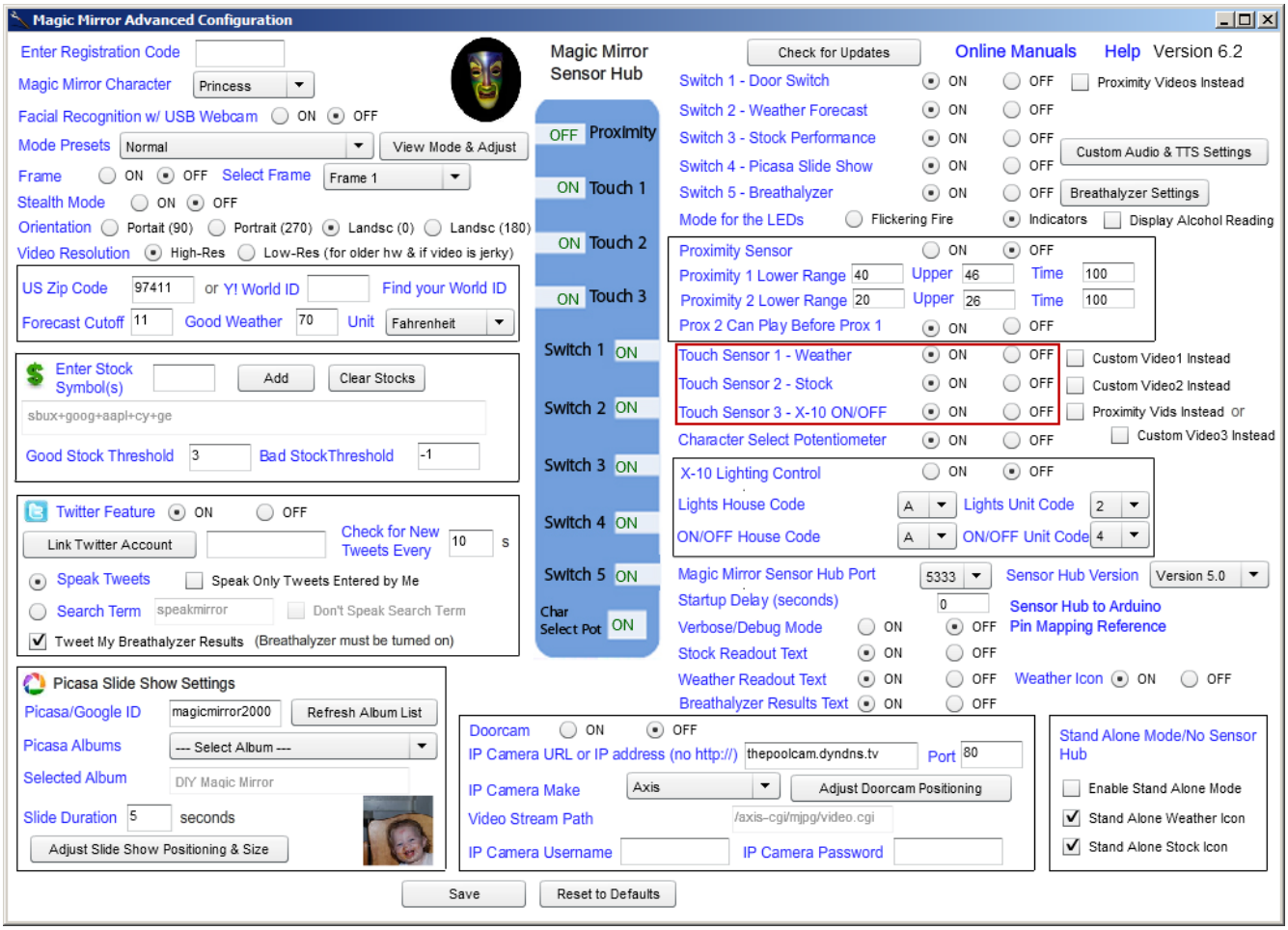
Touch Sensors

Per Appendix A and B, connect the Phidgets Touch Sensors. As reference, the Phidgets Touch Sensors P/N 1110 will read +5V normally and 0V when touched.

You'll need to cut off the end connectors of the Phidgets Touch Sensors. The red wire should go to a wire nut with the +5v connections, the black wire to a wire nut with the GND connections, and the white wire to the respective Sensor Hub input pin. If you need to lengthen the Phidgets Touch Sensor cable, the cable can be extended up to 100 feet.

Launch "Magic Mirror Advanced Setup" 

and turn on the touch sensor inputs that are wired up and click < Save >. IMPORTANT: Only turn on the Touch Sensor inputs for the ones you have connected.

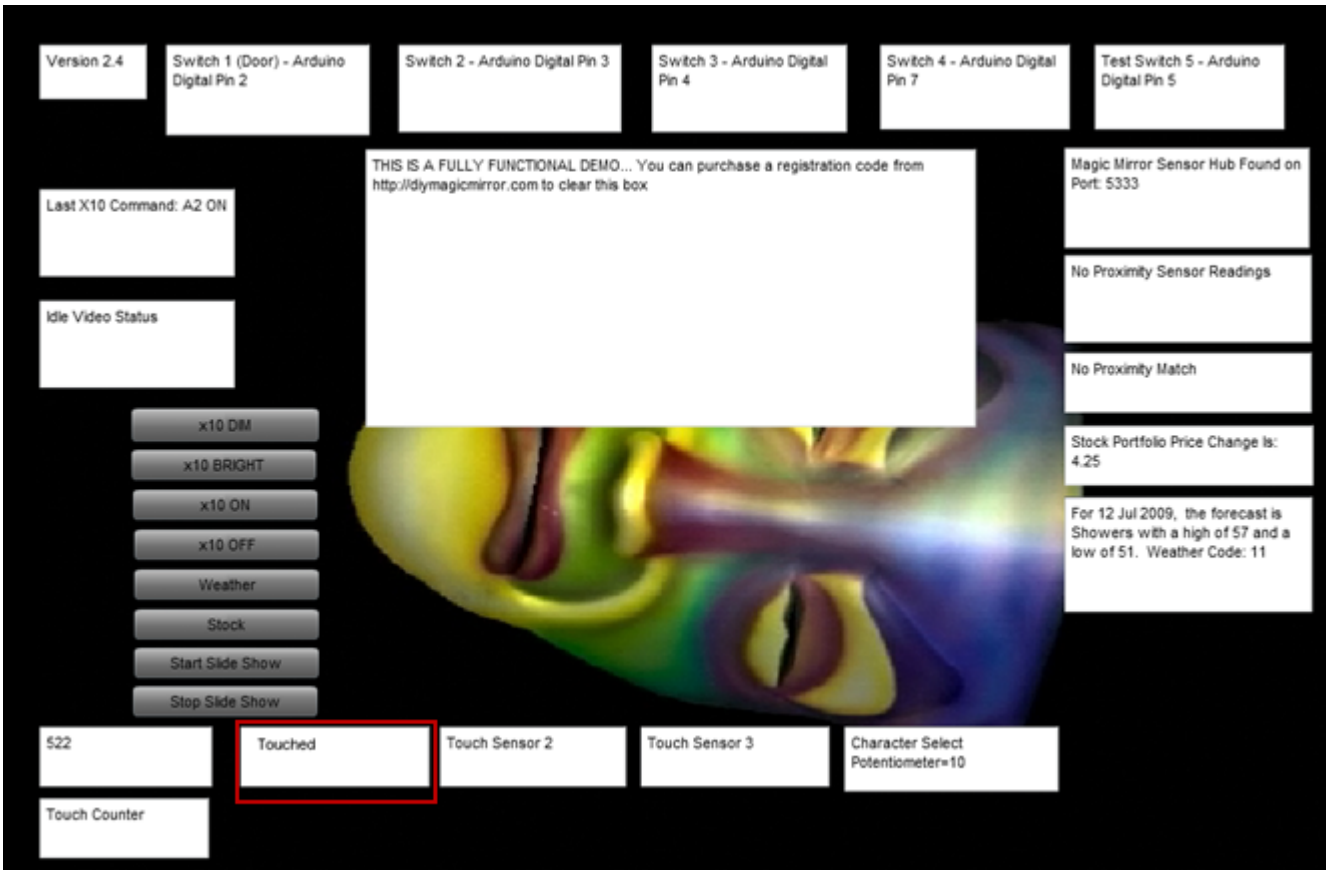


Launch “Run Magic Mirror ” 

on the PC and “mirror” 

on Mac and Linux.

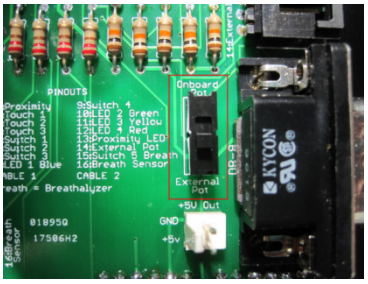
Touch “Touch Sensor 1” and you will see “Touched” and a weather video play. Also test Touch Sensor 2 and Touch Sensor 3.

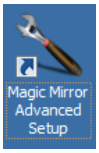


Exit out of the software

Changing the Character

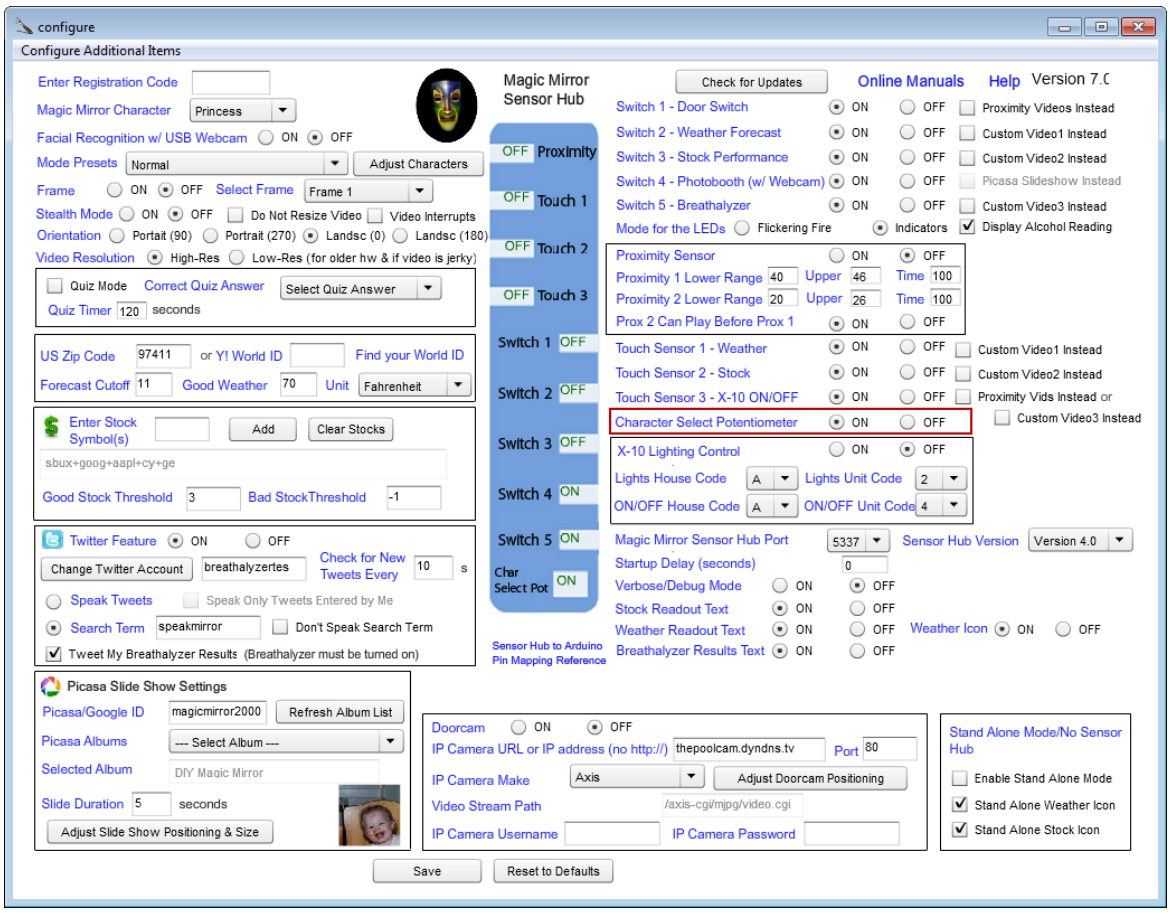
If using an externally mounted potentiometer to change the Magic Mirror character as opposed to the onboard potentiometer, move the slide switch on the Magic Mirror board towards the “External Pot” position as shown in the picture below.



Launch “Magic Mirror Advanced Setup” 

and ensure Character Select Potentiometer is ON and click < Save >. If you would like the Magic Mirror character to be only set from the Configuration Program/Software, then change to OFF. The Default is ON.

Note: You do not have to specify whether or not you are using the onboard or external potentiometer in the configuration program.

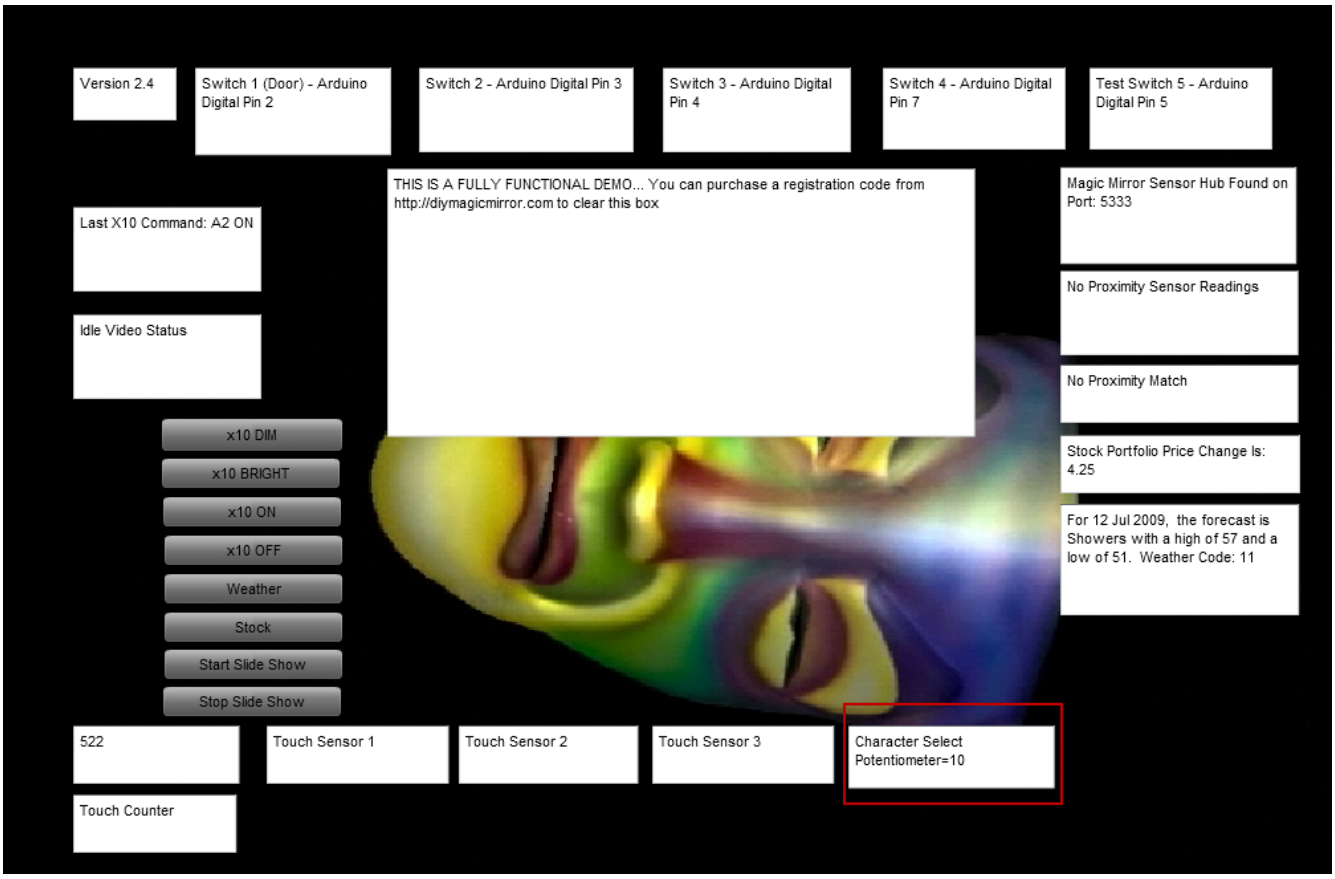


Launch “Run Magic Mirror ” 

on the PC and “mirror” 

on Mac and Linux.

Now turn the potentiometer knob and you should see the “Character Select Potentiometer” box change along with the character (princess, pirate, Halloween, insult, or TTS/custom audio).

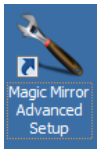


The Magic Mirror Characters:

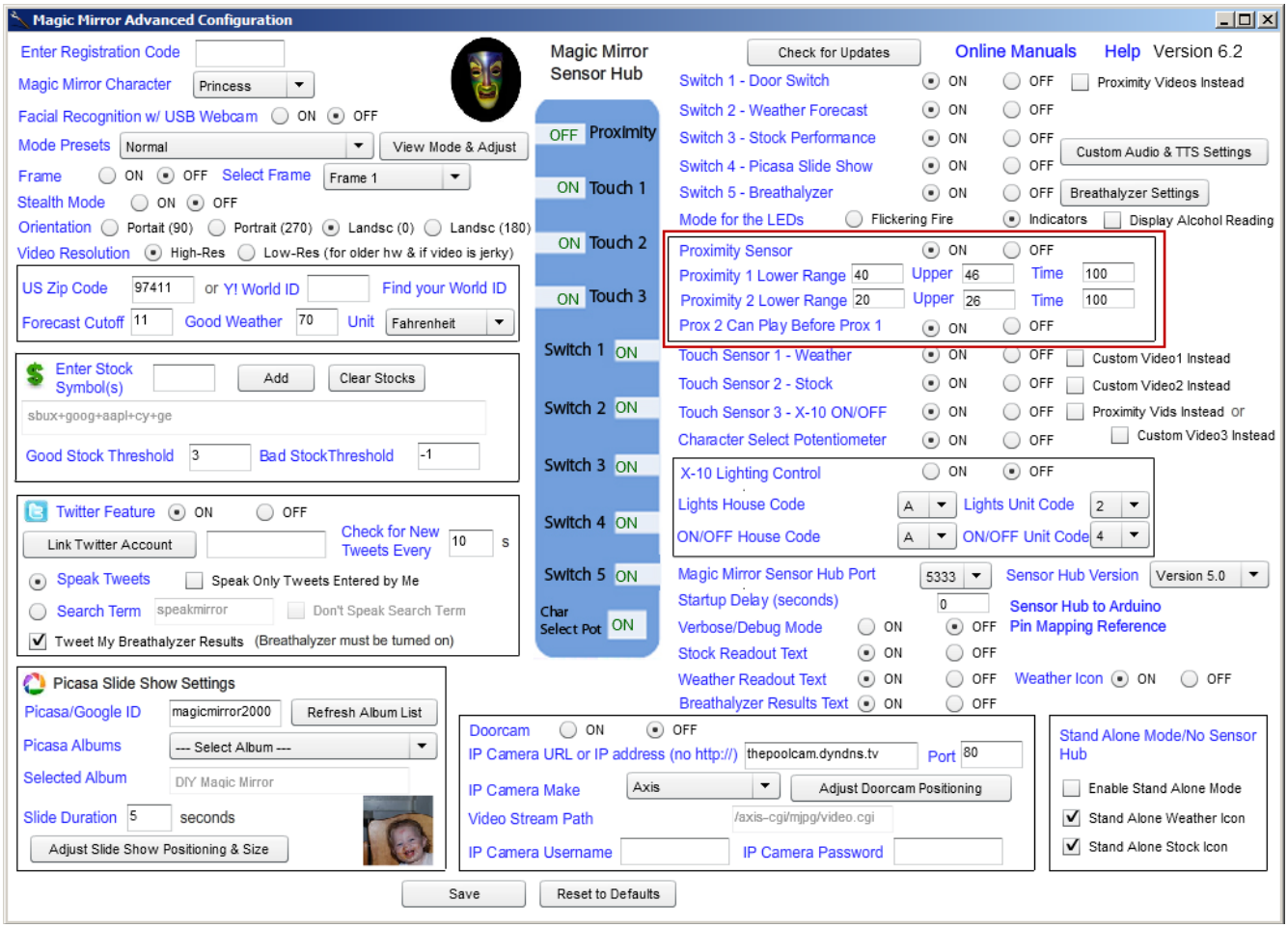
Princess Pirate Halloween Insult

Proximity Sensor

Connect the proximity sensor, per Appendix A. The LV-MaxSonar EZ-1 detects objects from 0 to 21 feet (6.45 meters).

Launch “Magic Mirror Advanced Setup” 

and turn on the proximity sensor. The Proximity 1 video will play when the subject is within a distance between the **Proximity 1 Lower Range and Proximity 1 Upper Range** settings. The Proximity 2 video will play when the subject is within a distance between the **Proximity 2 Lower Range** and **Proximity 2 Upper Range** settings. The units are roughly inches but not exact so some trial and error will be required here. The Time settings determine how long the subject must stand within the distance before the proximity videos plays. A setting of 100 equates to roughly 2 seconds but some trial and error will be required here. If Prox 2 Can Play Before Prox 1 is set to **OFF**, then the first proximity video must be triggered before the second proximity video can play.



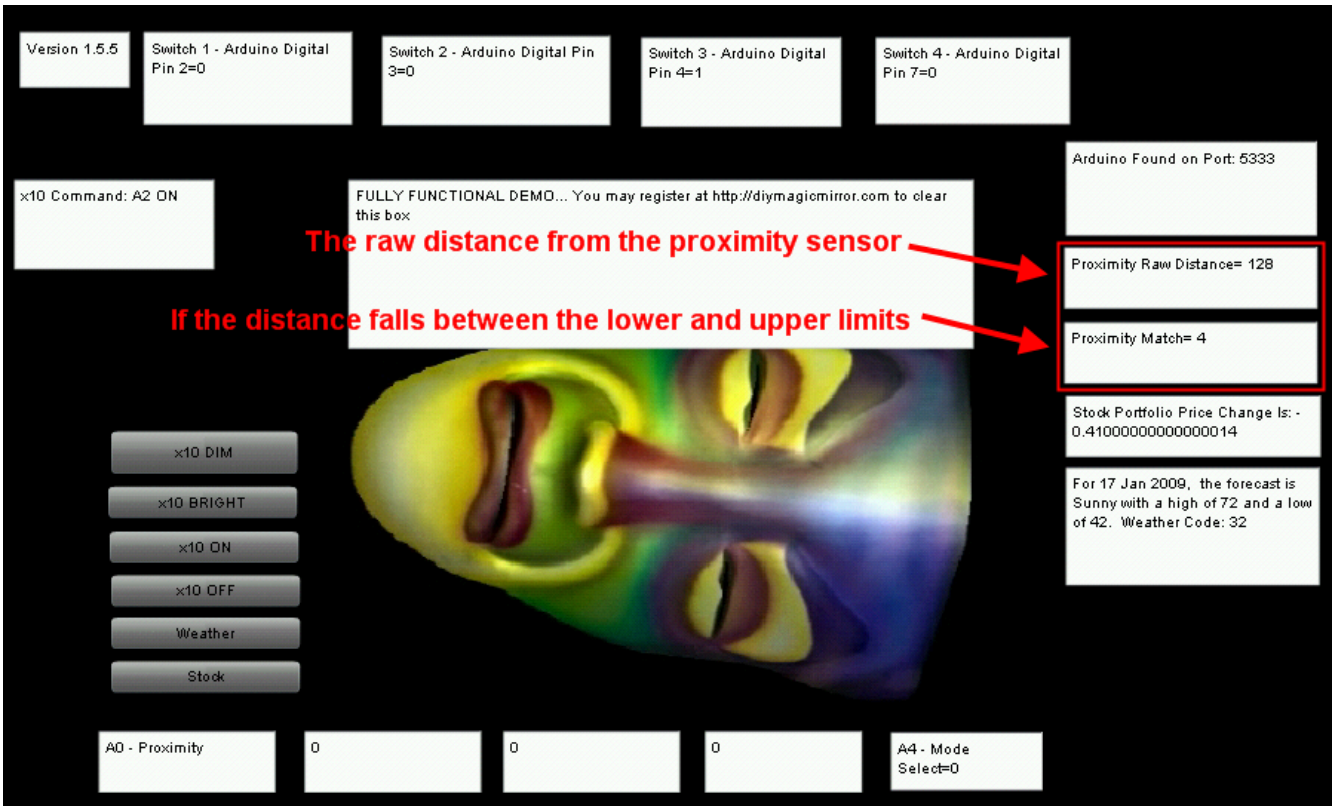
Launch “Run Magic Mirror ” 

on the PC and “mirror” 

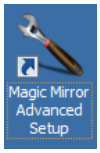
on Mac and Linux and stand in front of the proximity sensor at various distances. When you are within the range specified by **Proximity Lower Range** and **Proximity Upper Range**, you will see this number increase and a proximity video will trigger when it reaches the Time setting (100 in this example). Continue to tweak the settings and re-launch “Run Magic Mirror” until calibrated to your liking. IMPORTANT: Be sure to check the readings when no subject is in front of the proximity sensor (i.e. when no one is in the room) and ensure that your distance settings do not fall within this range otherwise the proximity videos will go off at random.

Once you have the desired settings, it may be helpful to place a sticker or some kind of indicator on the floor so your subjects know where to stand to trigger the proximity videos.

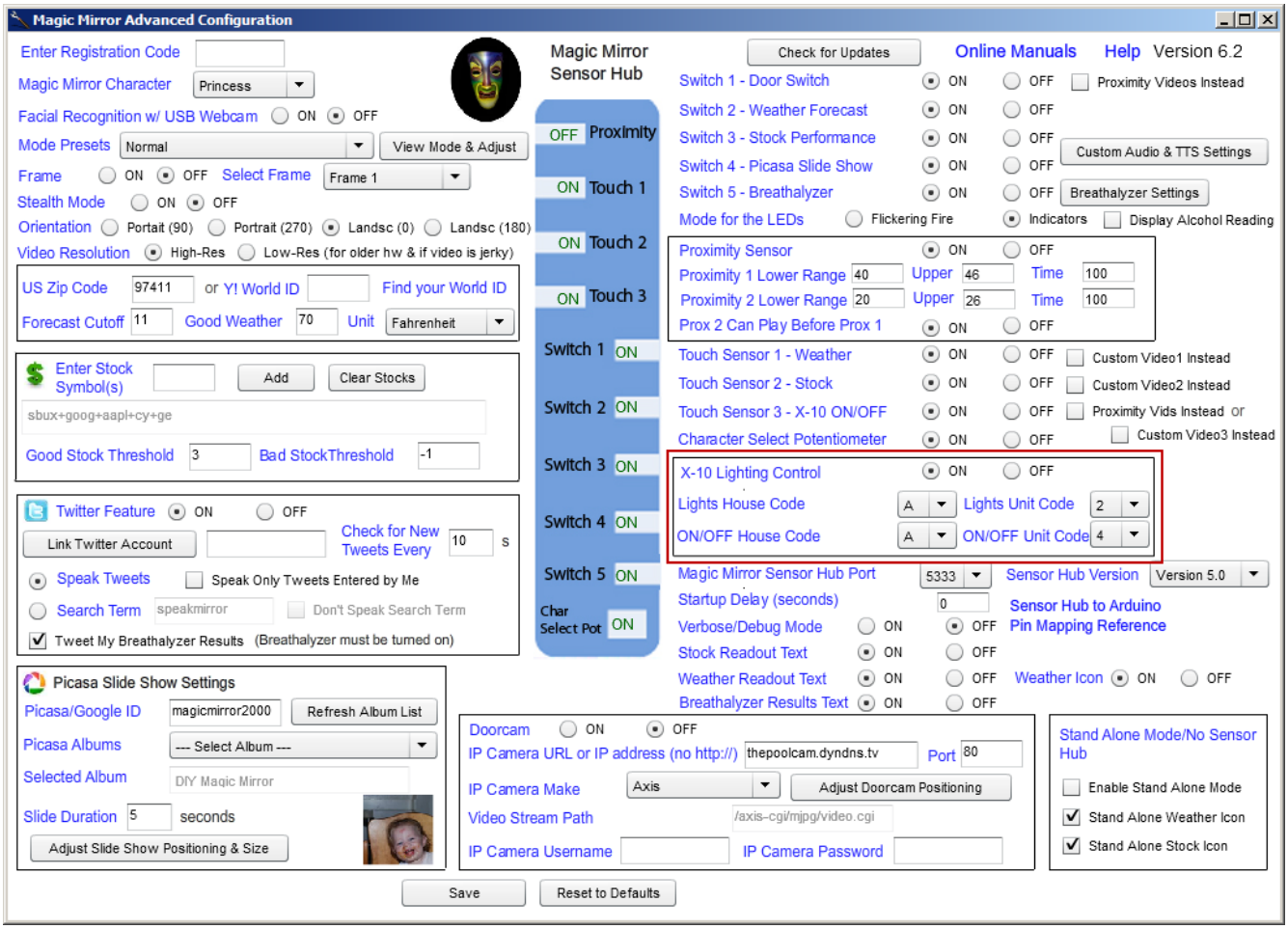
If the proximity LED is hooked up, this LED will blink when the subject is within range providing a visual indicator that the subject is standing in the right place. The proximity LED will then turn solid when the proximity videos are playing and turn off when the proximity videos have finished playing.



X-10 Control



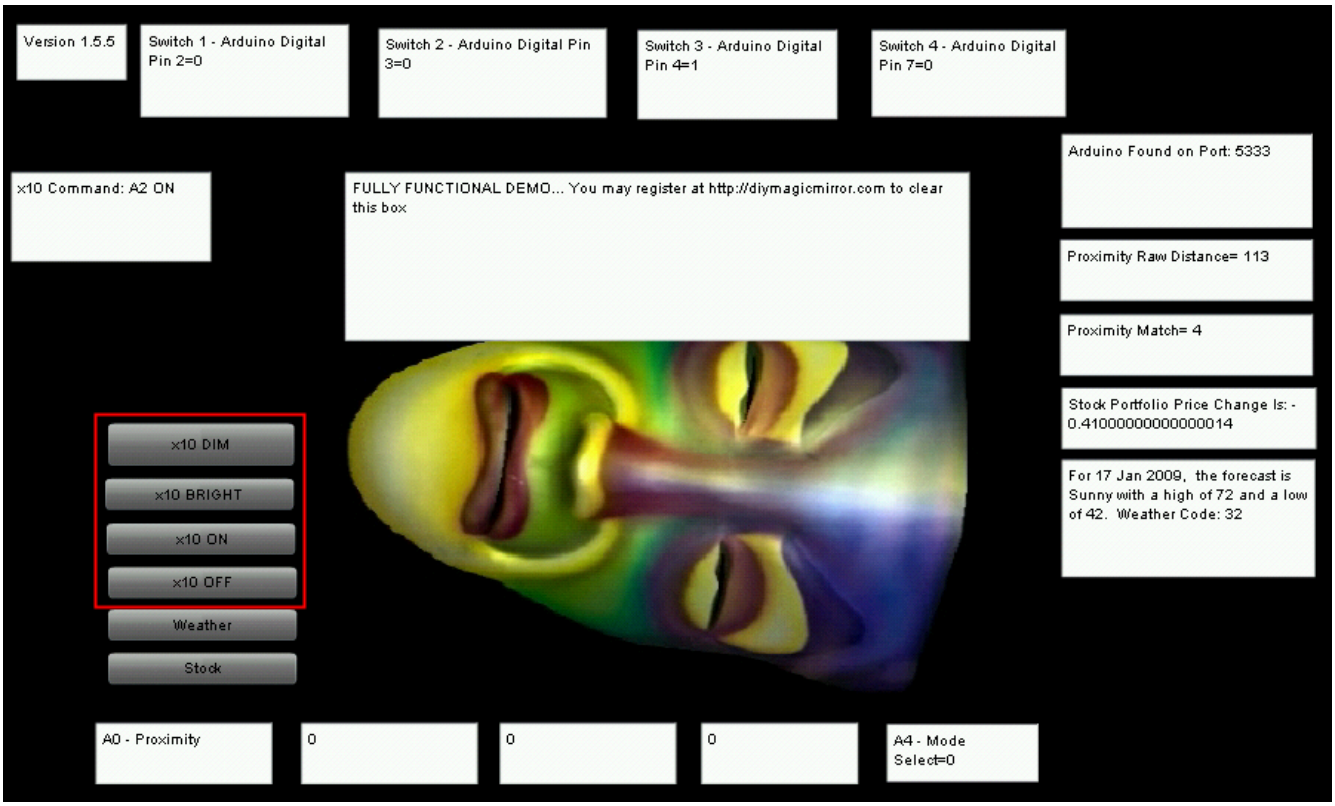
Launch “Magic Mirror Advanced Setup” and ensure X-10 Control is ON and set the **Lights House Code** and **Lights Unit Code** to match the X-10 address of the module controlling your lights. If you have the Touch Sensor 3 – X10 ON/OFF sensor hooked up, then also set the ON/OFF House Code and ON/Off Unit Code to match the X-10 address of that X-10 module.



Important X-10 will not work across different AC circuits without a separate X-10 signal amplifier module so make sure that the X-10 RF Base Receiver is on the same circuit as your X-10 modules.

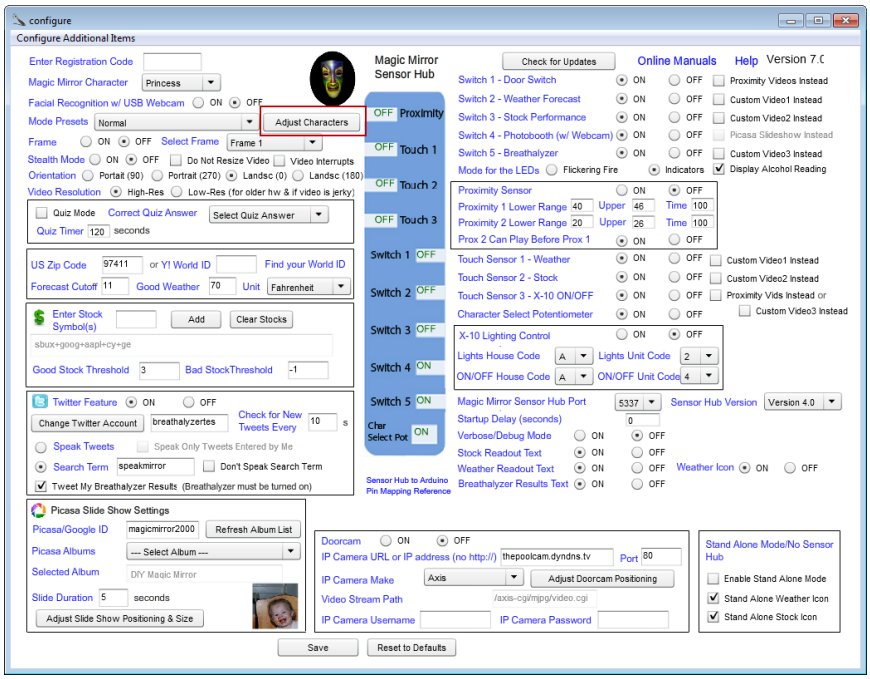
Launch “Run Magic Mirror ” on the PC and “mirror” 

on Mac and Linux and click the x10 buttons to test the X-10 lighting control. If the lights are not responding, check your wiring and also ensure the X-10 address on your X-10 device matches the X-10 address set in the configuration program.

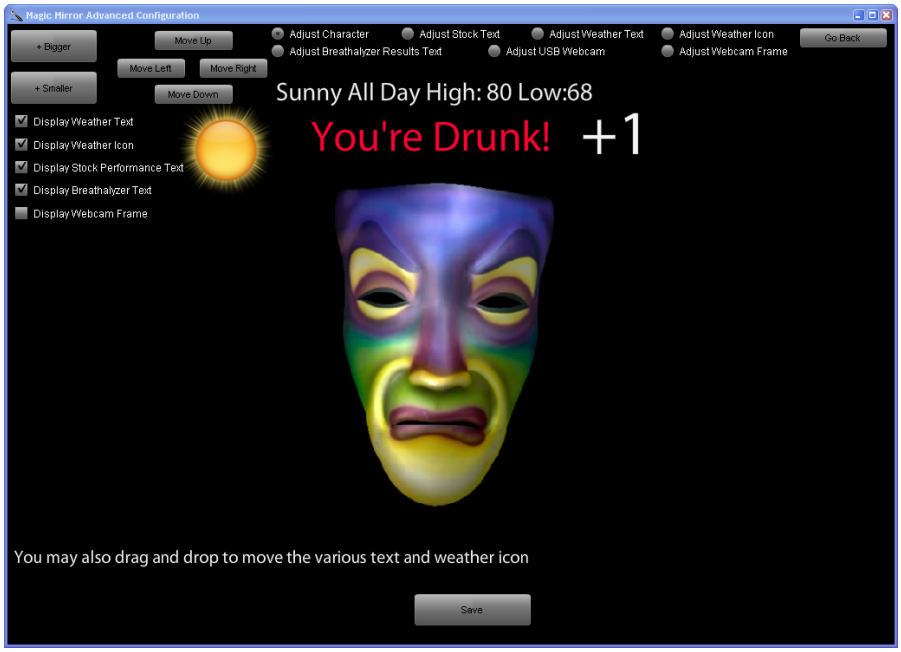


Adjusting the Size and Position of the Characters and Text

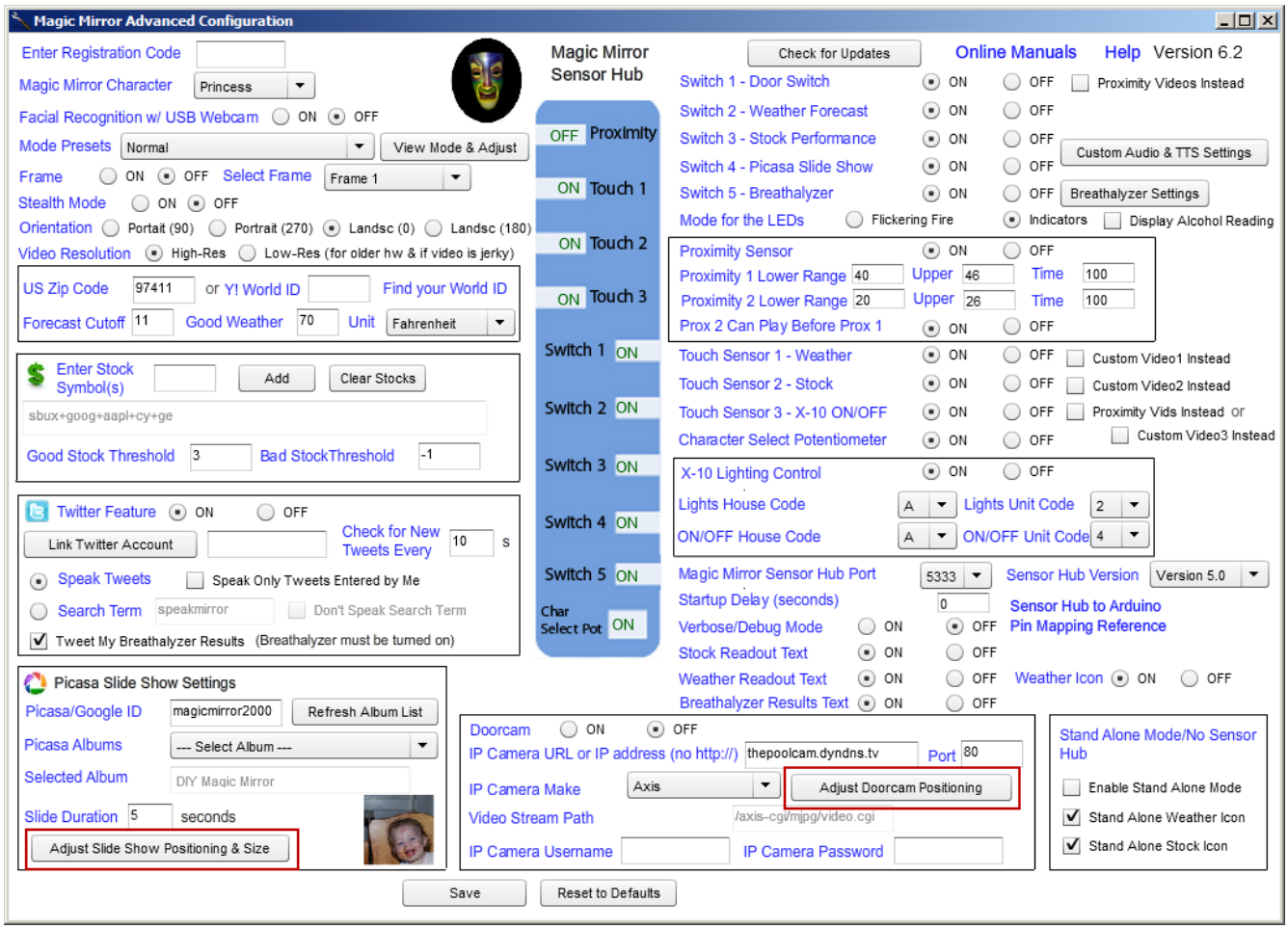
If you need to adjust the size or position of the character, then click the **Adjust Characters** button. Note: If you change the **Orientation** (Portrait or Landscape), then you'll need to re-start the configuration program to continue.



Use the buttons on the left to move and re-size the character. You may also move (drag and drop) and re-size the stock readout text, weather readout text, Breathalyzer text, and weather icon from here.

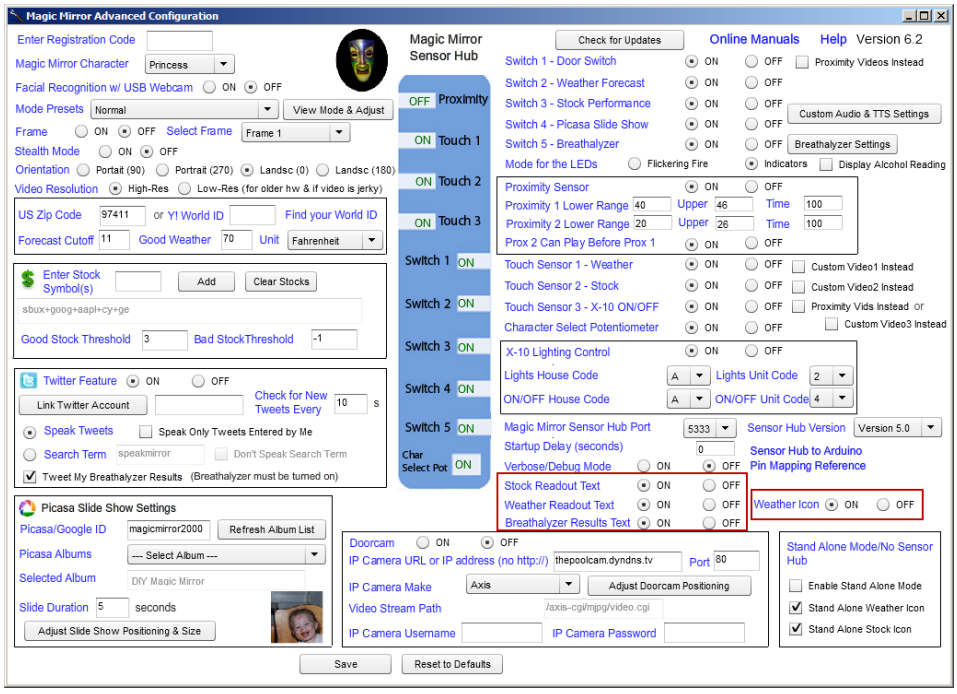


You may also adjust the size and positioning of the Picasa Slide Show and Doorcam in the same manner.

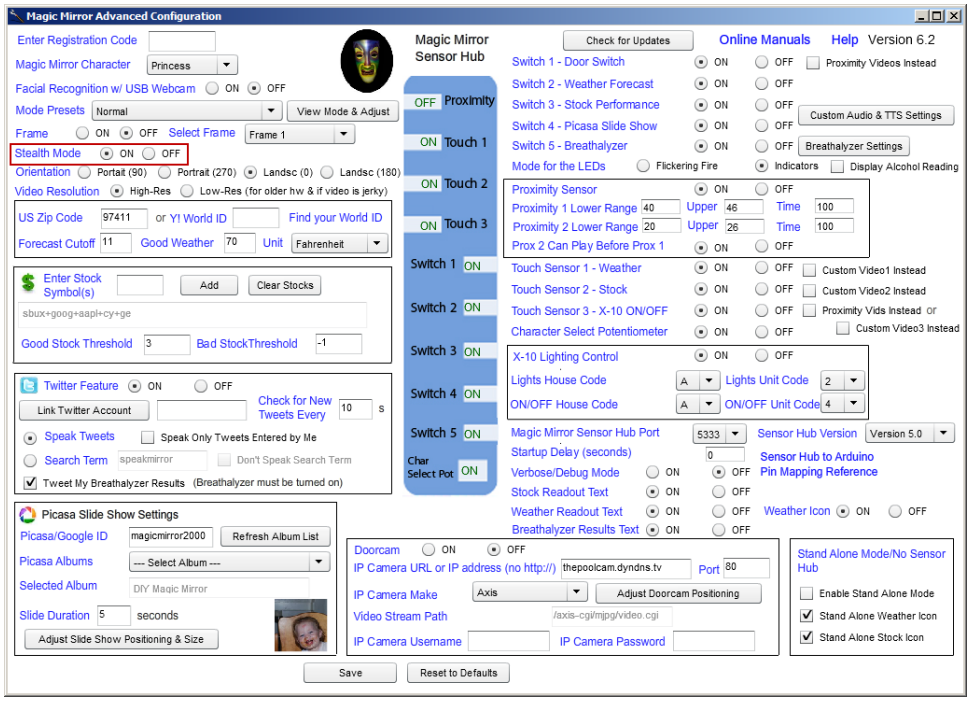

Magic Mirror Advanced Configuration
Enter Registration Code
Magic Mirror Character
Princess
Facial Recognition w/ USB Webcam ON OFF
Mode Presets
Normal
View Mode & Adjust
Frame ON OFF Select Frame
Frame 1
Stealth Mode ON OFF
Orientation Portait (90) Portrait (270) Landsc (0) Landsc (180)
Video Resolution High-Res Low-Res (for older hw & if video is jerky)
US Zip Code
97411
or Y! World ID
Find your World ID
Forecast Cutoff
11
Good Weather
70
Unit
Fahrenheit
Enter Stock Symbol(s)
Add
Clear Stocks
sbux+goog+aapl+cy+ge
Good Stock Threshold
3
Bad StockThreshold
-1
Twitter Feature ON OFF
Link Twitter Account
Check for New Tweets Every
10
s
Speak Tweets
Speak Only Tweets Entered by Me
Search Term
speakmirror
Don't Speak Search Term
Tweet My Breathalyzer Results (Breathalyzer must be turned on)
Picasa Slide Show Settings
Picasa/Google ID
magicmirror2000
Refresh Album List
Picasa Albums
--- Select Album ---
Selected Album
DIY Magic Mirror
Slide Duration
5
seconds
Adjust Slide Show Positioning & Size
Magic Mirror Sensor Hub
OFF Proximity
ON Touch 1
ON Touch 2
ON Touch 3
Switch 1 ON
Switch 2 ON
Switch 3 ON
Switch 4 ON
Switch 5 ON
Char Select Pot ON
Check for Updates
Online Manuals
Help
Version 6.2
Switch 1 - Door Switch ON OFF Proximity Videos Instead
Switch 2 - Weather Forecast ON OFF
Switch 3 - Stock Performance ON OFF
Switch 4 - Picasa Slide Show ON OFF
Custom Audio & TTS Settings
Switch 5 - Breathalyzer ON OFF
Breathalyzer Settings
Mode for the LEDs Flickering Fire Indicators Display Alcohol Reading
Proximity Sensor ON OFF
Proximity 1 Lower Range 40 Upper 46 Time 100
Proximity 2 Lower Range 20 Upper 26 Time 100
Prox 2 Can Play Before Prox 1 ON OFF
Touch Sensor 1 - Weather ON OFF Custom Video1 Instead
Touch Sensor 2 - Stock ON OFF Custom Video2 Instead
Touch Sensor 3 - X-10 ON/OFF ON OFF Proximity Vids Instead or
Character Select Potentiometer ON OFF Custom Video3 Instead
X-10 Lighting Control ON OFF
Lights House Code A Lights Unit Code 2
ON/OFF House Code A ON/OFF Unit Code 4
Magic Mirror Sensor Hub Port 5333
Sensor Hub Version Version 5.0
Startup Delay (seconds) 0
Sensor Hub to Arduino Pin Mapping Reference
Verbose/Debug Mode ON OFF
Stock Readout Text ON OFF
Weather Readout Text ON OFF
Weather Icon ON OFF
Breathalyzer Results Text ON OFF
Doorcam ON OFF
IP Camera URL or IP address (no http://) thepoolcam.dyndns.tv
Port 80
IP Camera Make Axis
Adjust Doorcam Positioning
Video Stream Path /axis-cgi/mjpg/video.cgi
IP Camera Username
IP Camera Password
Stand Alone Mode/No Sensor Hub
Enable Stand Alone Mode
Stand Alone Weather Icon
Stand Alone Stock Icon
Save
Reset to Defaults

Weather, Stock, Breathalyzer Read-Outs & Stealth Mode

If **Stock Readout Text** is set to ON, a numeric display of stock performance will display along with the stock video. **Weather Readout Text** will display a brief text forecast while the weather video plays. **Weather Icon** will display a weather icon corresponding to the weather forecast while the weather video plays. You may turn these ON and OFF here.



Set **Stealth Mode** to ON to run the Magic Mirror in stealth mode meaning that videos will play only when a sensor has been triggered. Use this if you need the element of surprise in your installation.



LED Control

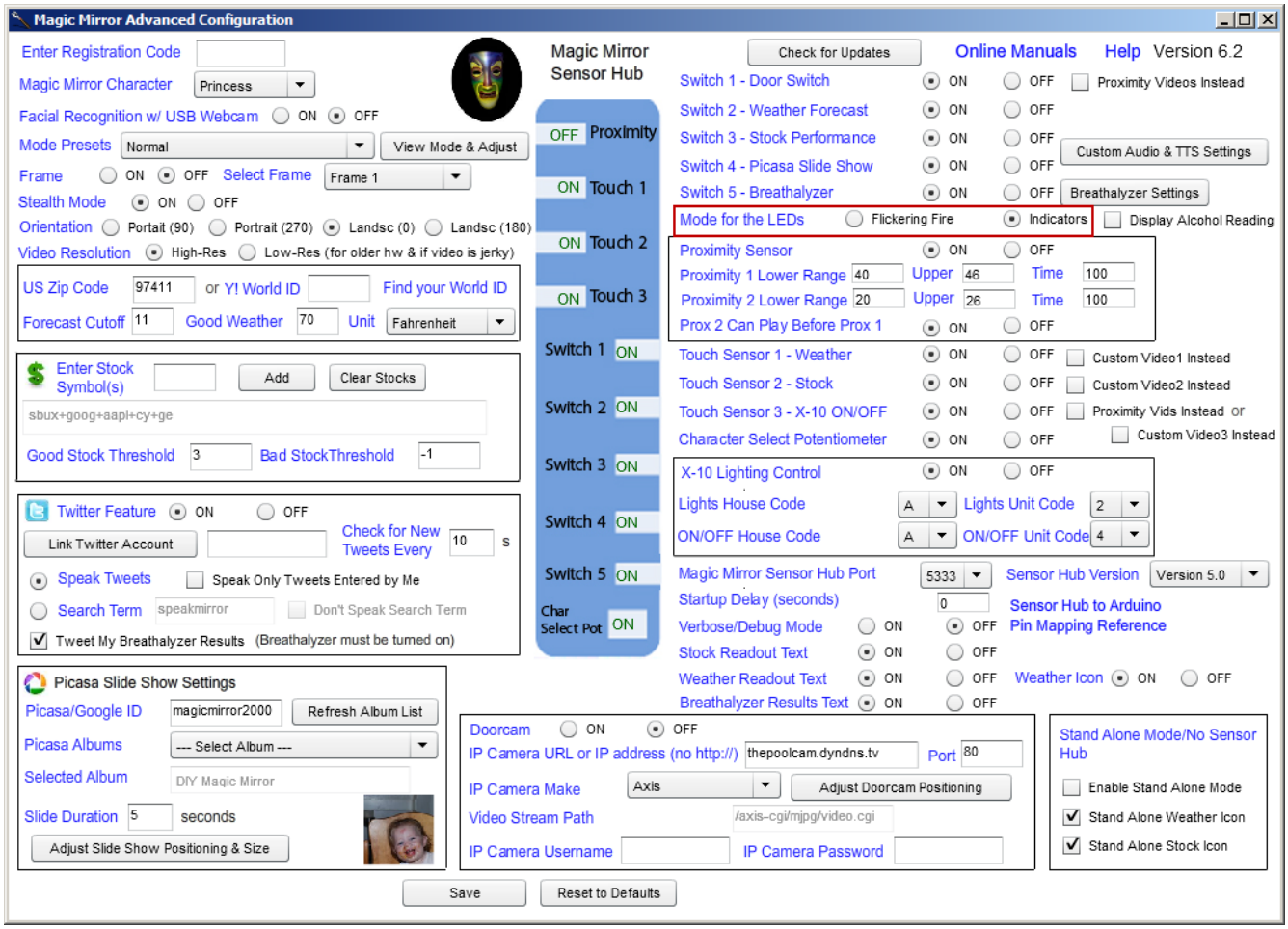
Choose “Indicators” or “Flickering Fire” mode for the LEDs. “Indicators” is the default mode.

“Indicators” Mode

LED1 (Blue) - Lit when Breathalyzer is Ready
LED2 (Green) - Lit when few drinks on Breathalyzer and also for Good Weather and Good Stocks
LED3 (Yellow) – Lit when buzzed on Breathalyzer and also for OK Weather and OK Stock Performance
LED4 (Red) - Lit when flat out drunk on Breathalyzer and also for Bad Weather and Bad Stock Performance

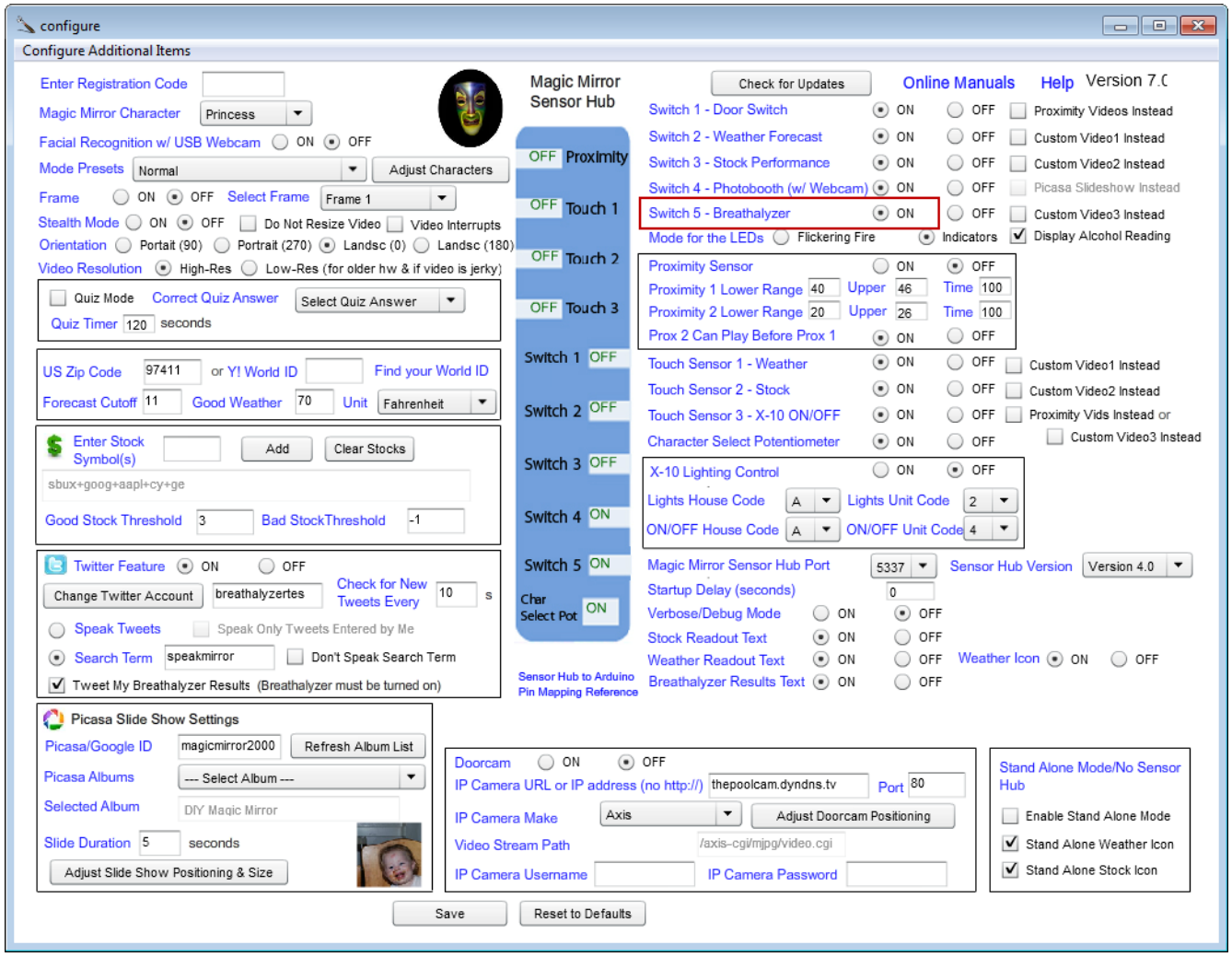
“Flickering Fire” Mode

LED1 – LED4 will flicker for a fake fire effect. Use high brightness red LEDs if using this mode.

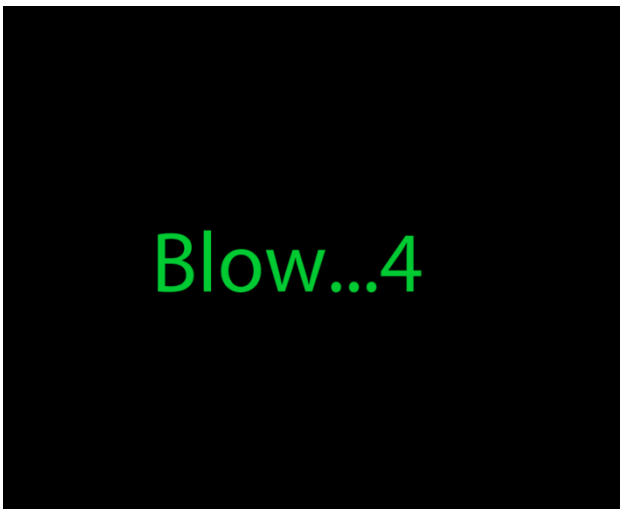


Breathalyzer

After wiring up the Alcohol Sensor and the Breathalyzer Switch (Switch 5), set “Switch 5 – Breathalyzer” to “ON”.



Push the Switch 5 button to start the Breathalyzer. You'll be prompted to blow into the alcohol sensor. The alcohol sensor is hot so just blow on the alcohol sensor without touching it with your mouth. At the end of the countdown, the Magic Mirror will speak one of the responses in figure 5. The responses in figure 5 will be proportional to your alcohol intake but please note that the Magic Mirror Breathalyzer is **not** a professional Breathalyzer (it does not provide a blood alcohol content number) and should be used for novelty purposes only.



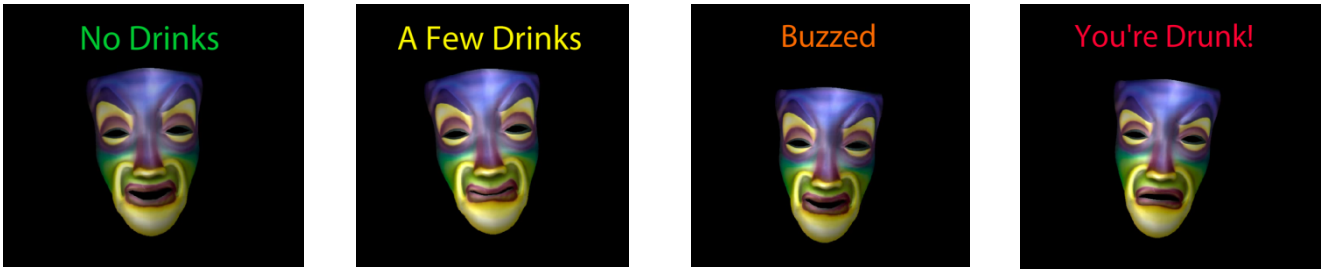
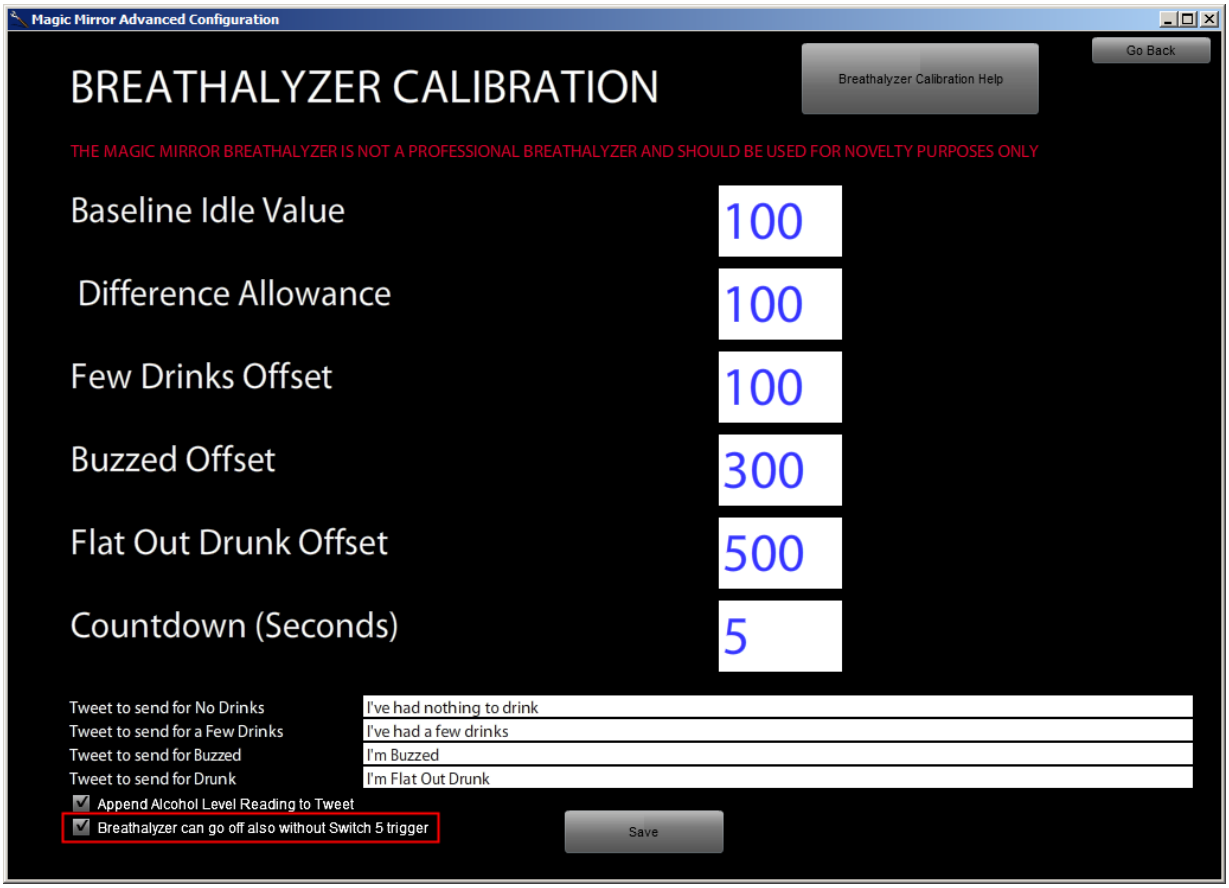
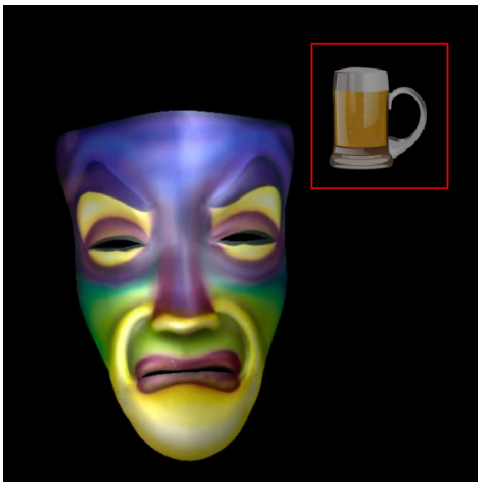


Figure 5 – Breathalyzer Responses

To trigger the Breathalyzer automatically by just blowing on the alcohol sensor and not having to push a button, check "**Breathalyzer can go off also without Swtich 5 trigger**". In this mode, the Breathalyzer will trigger if a change in alcohol level is detected.

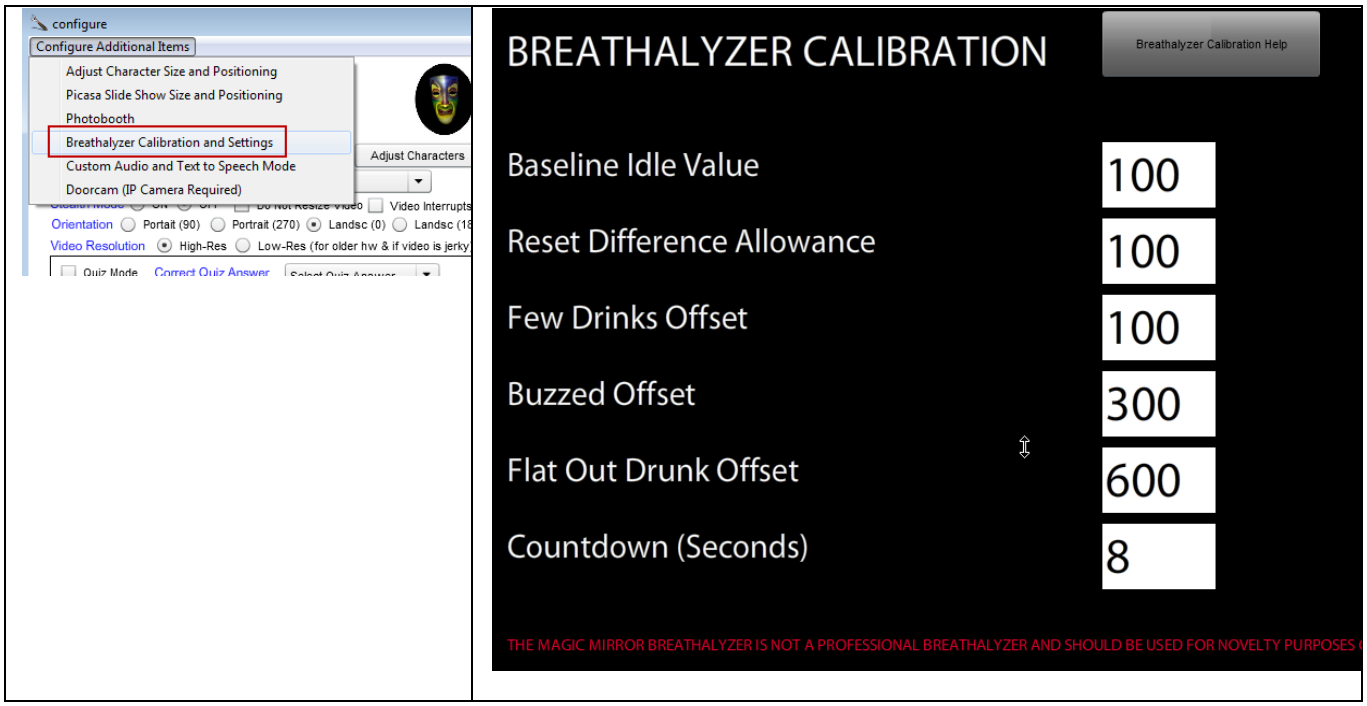


With this selection, the beer icon will appear when a change in alcohol level has been detected. The beer icon will fade for the number of seconds as specified in the "**Countdown (Seconds)**" above settings during which time the user should continue blowing until the beer icon has faded away and then the Magic Mirror will give the alcohol level reading in figure 5.

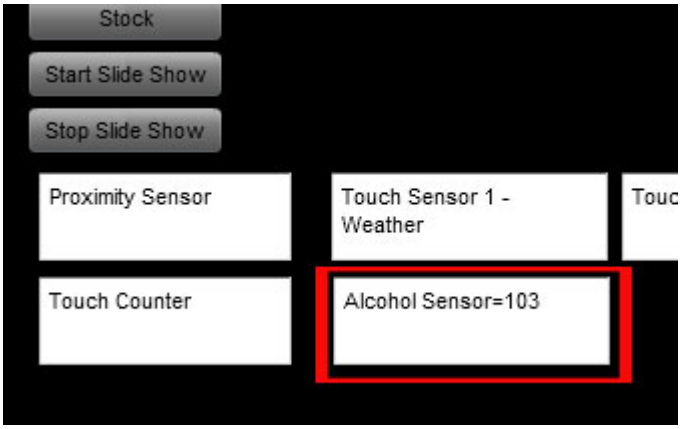


Breathalyzer Calibration Settings

You may also calibrate the thresholds of the responses. To change the default settings, click "Configure Additional Items" and then "Breathalyzer Calibration and Settings".



Baseline Idle Value: After hooking up the Breathalyzer, set the configuration program and run the Magic Mirror in verbose mode. While in verbose mode, look for the Alcohol Sensor box and then enter the idle/steady state value when no alcohol is near the Breathalyzer. The value you enter does not need to be exact. When the Breathalyzer run each time, it will obtain a new baseline value (when no alcohol is present) dynamically. Default: 100



Reset Difference Allowance: When the Breathalyzer has detected alcohol, it can take some time for the alcohol sensor to reset back to the original Baseline Idle Value. To save time and because the Breathalyzer will obtain a new baseline value dynamically each time, it is not necessary that the alcohol sensor reset all the way back to the Baseline Idle Value. This setting determines how close the alcohol sensor readings needs to be before the next Breathalyzer reading can take place. For example, with the default Baseline Idle Value set to 100 and if the Reset Difference Allowance is set to 100, then the Breathalyzer will be ready for the next reading when the value is 200 or below. Default: 100

This text will appear while the Breathalyzer is resetting (has not reached the Reset Difference Allowance yet).

This text will appear when the Breathalyzer is within the Reset Difference Allowance and ready for the next reading.

Few Drinks Offset: Default: 100

Buzzed Offset: Default: 200

Flat Out Drunk Offset: Default: 300

Countdown (Seconds): Duration in seconds for the subject to blow into the Breathalyzer. Default: 5s

Example:

The Idle Baseline Value is 100, the Reset Difference Allownace is 100, and the dynamic baseline reading before the user blows into the Breathalyzer is 200.

Few Drinks: Dynamic Alcohol Basline (200) + 100 = 300

Buzzed: Few Drinks Value (200) + 300 = 500

Flat Out Drunk: Buzzed Value (200) + 600 = 800

If the actual reading is between 300 and 500, the Few Drinks video will play

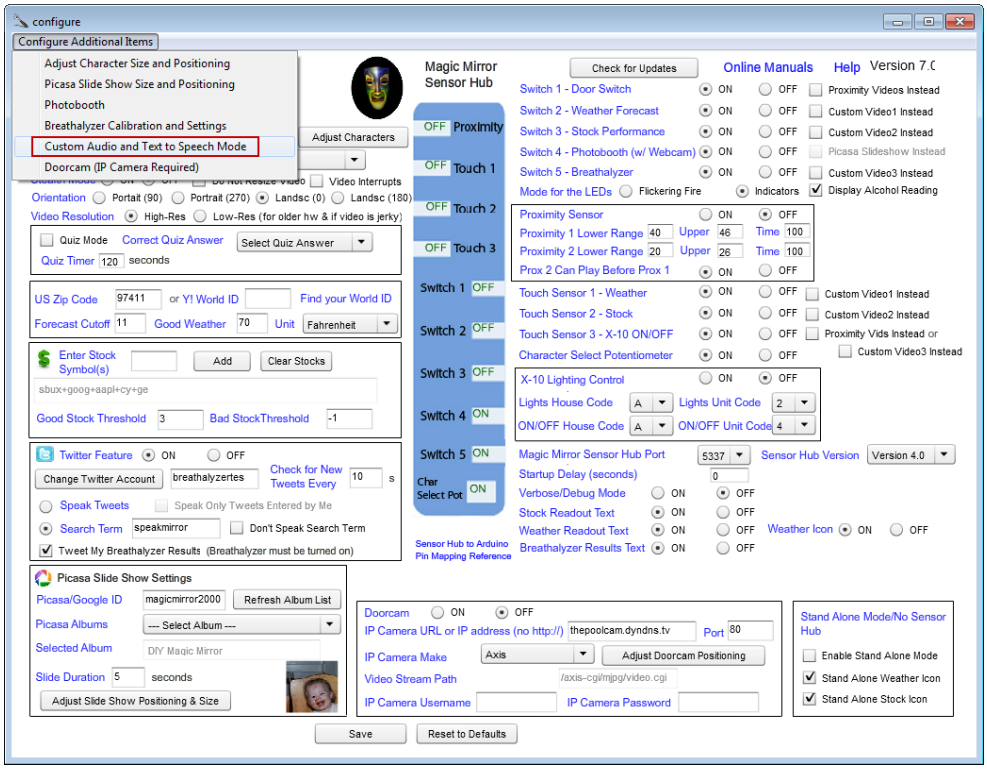
If the actual reading is between 500 and 800, the Buzzed video will play

If the actual reading is over 800, the Flat Out Drunk video will play

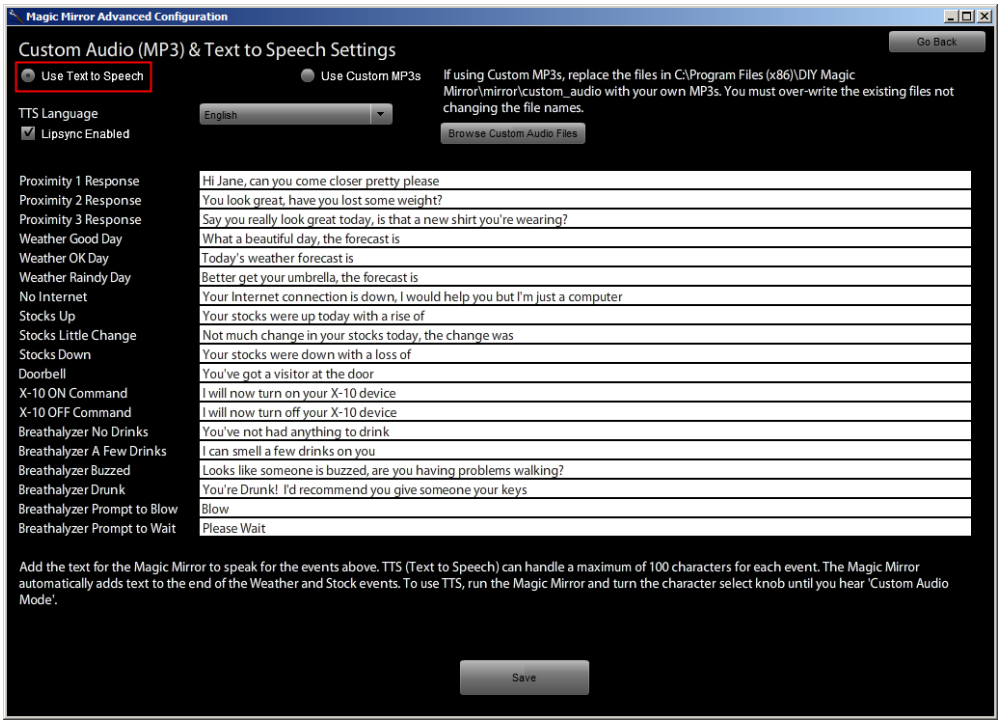
Once the actual reading has returned to 200 or less, the Breathalyzer will be reading for the next reading.

Custom Audio Mode (Text to Speech and User Supplied MP3s)

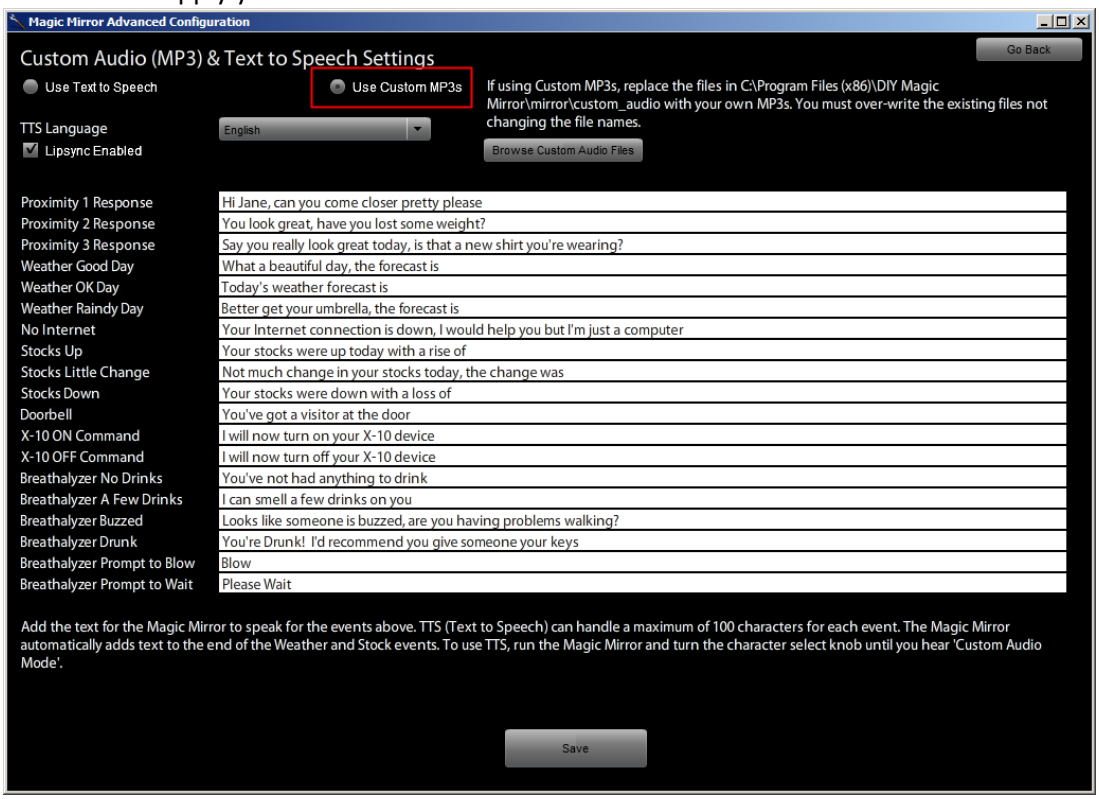
The Magic Mirror features a Text to Speech mode that allows you to define your own responses to the sensor events. Click “Configure Additional Items” and then “Custom Audio & Text to Speech Mode”.



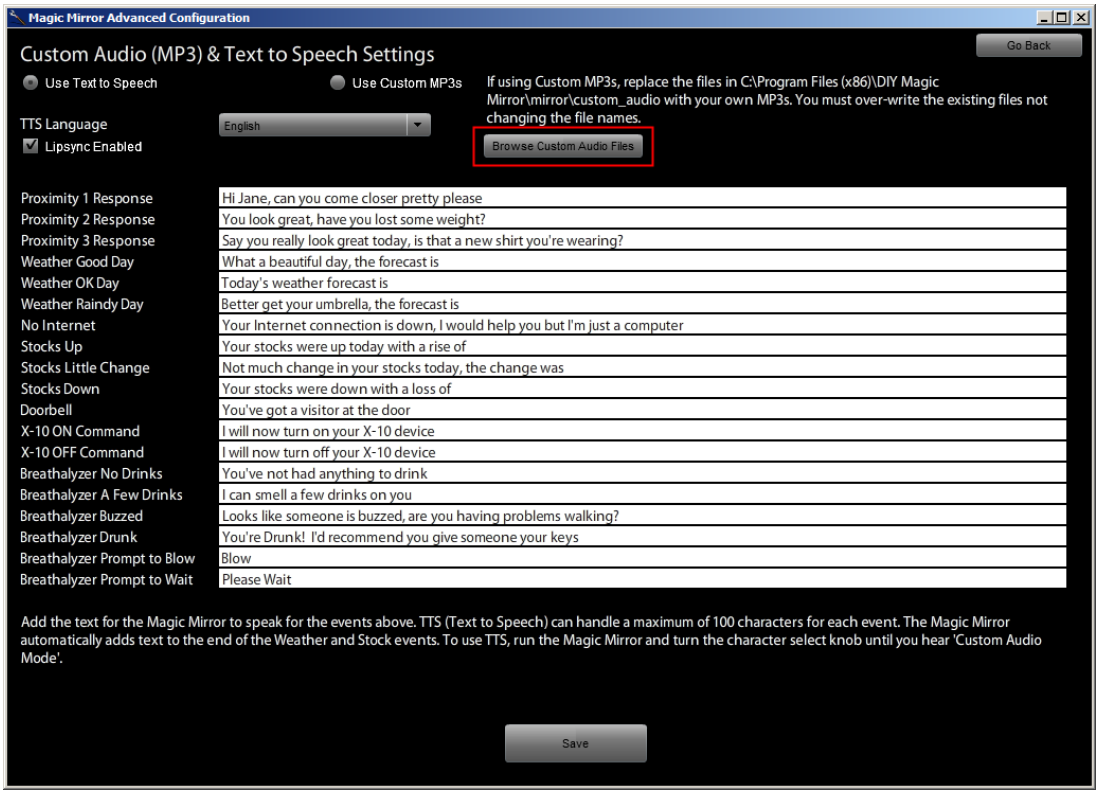
Select “Use Text to Speech”. Enter your desired responses for each sensor event and click “Save”.



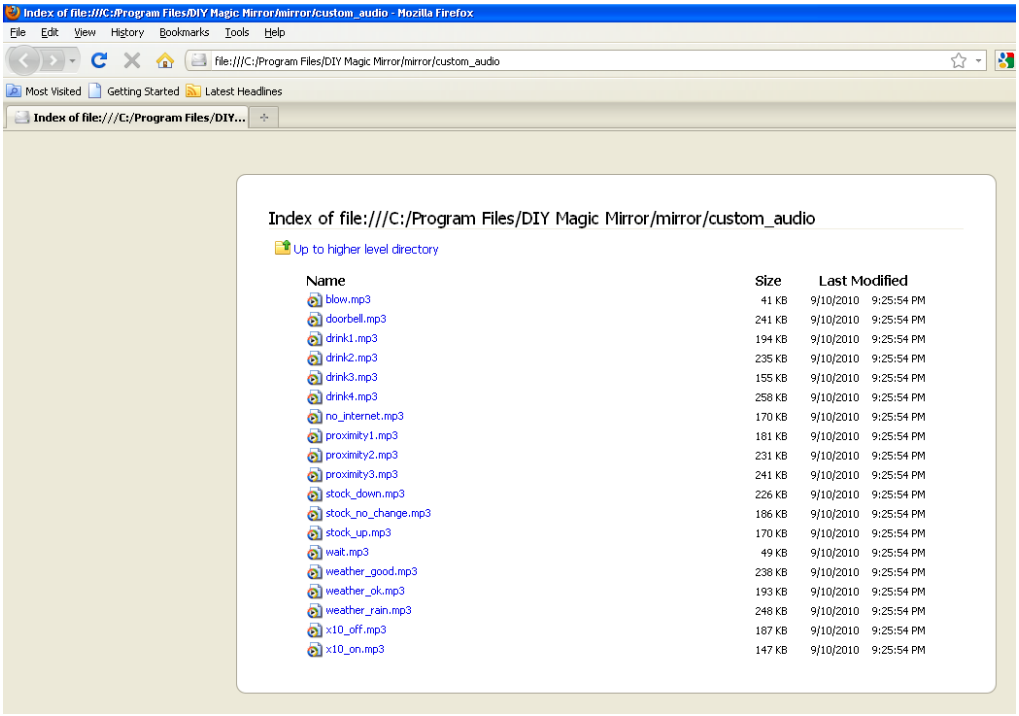
You can also supply your own MP3 file. Select "**Use Custom MP3s**".



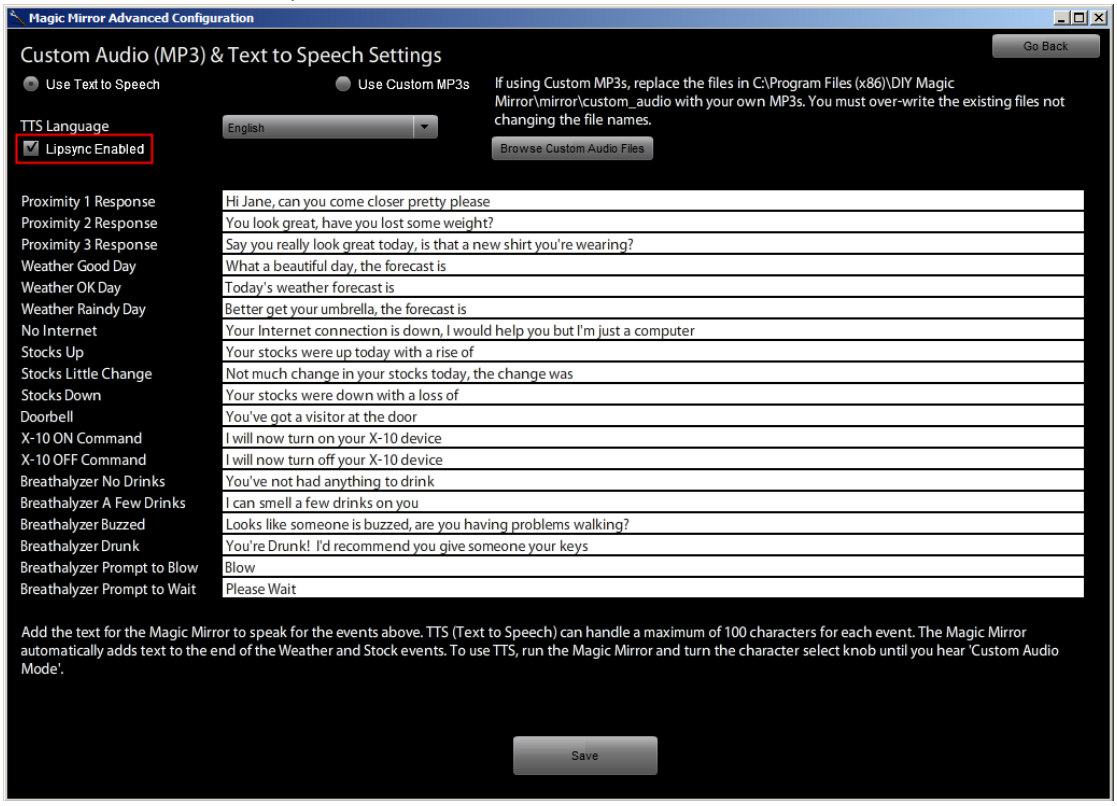
Click "**Browse Custom Audio Files**" to listen to the current sound files.



Over-write the desired MP3 files with your own.



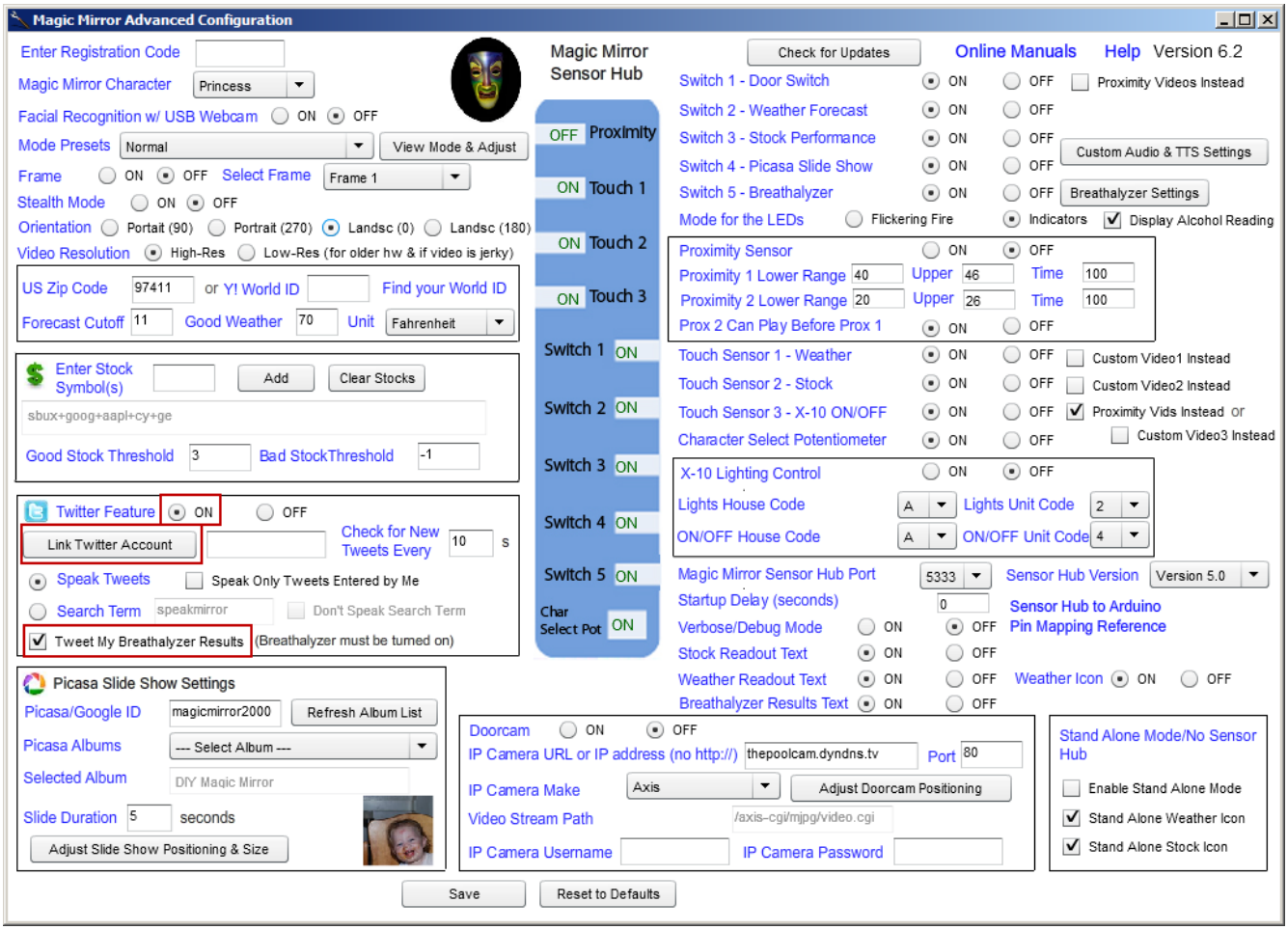
Check “Lipsync Enabled” to enable the lipsync feature. If this is not checked, a video will play but the lipsync movements will not be synced to the audio.

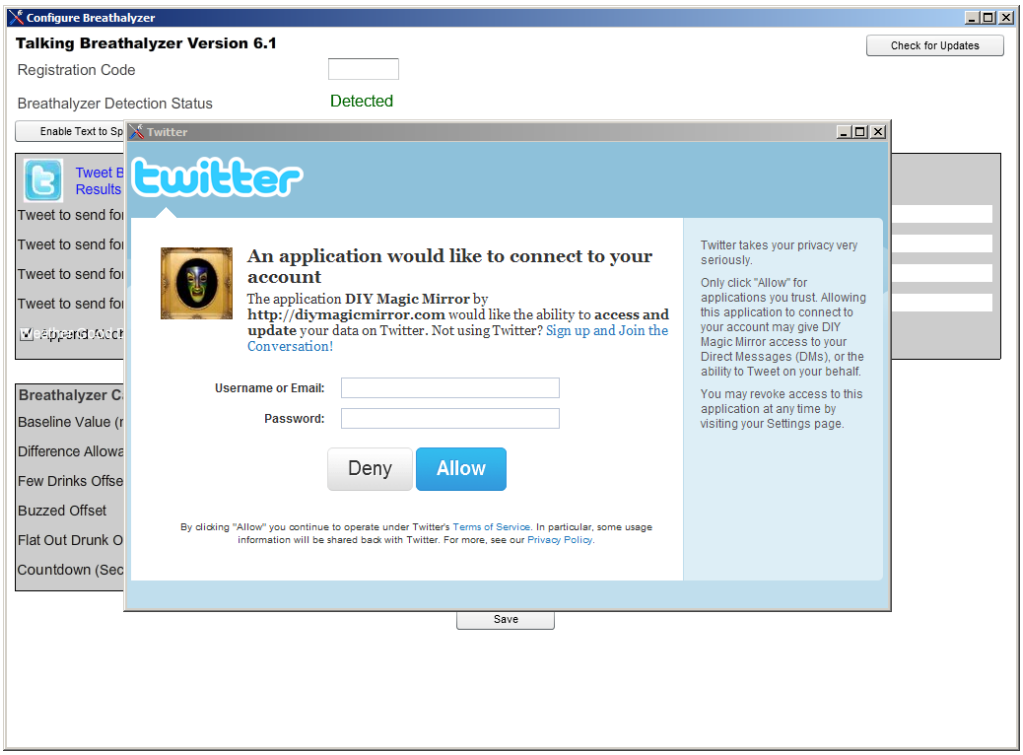


Using the Twitter Feature

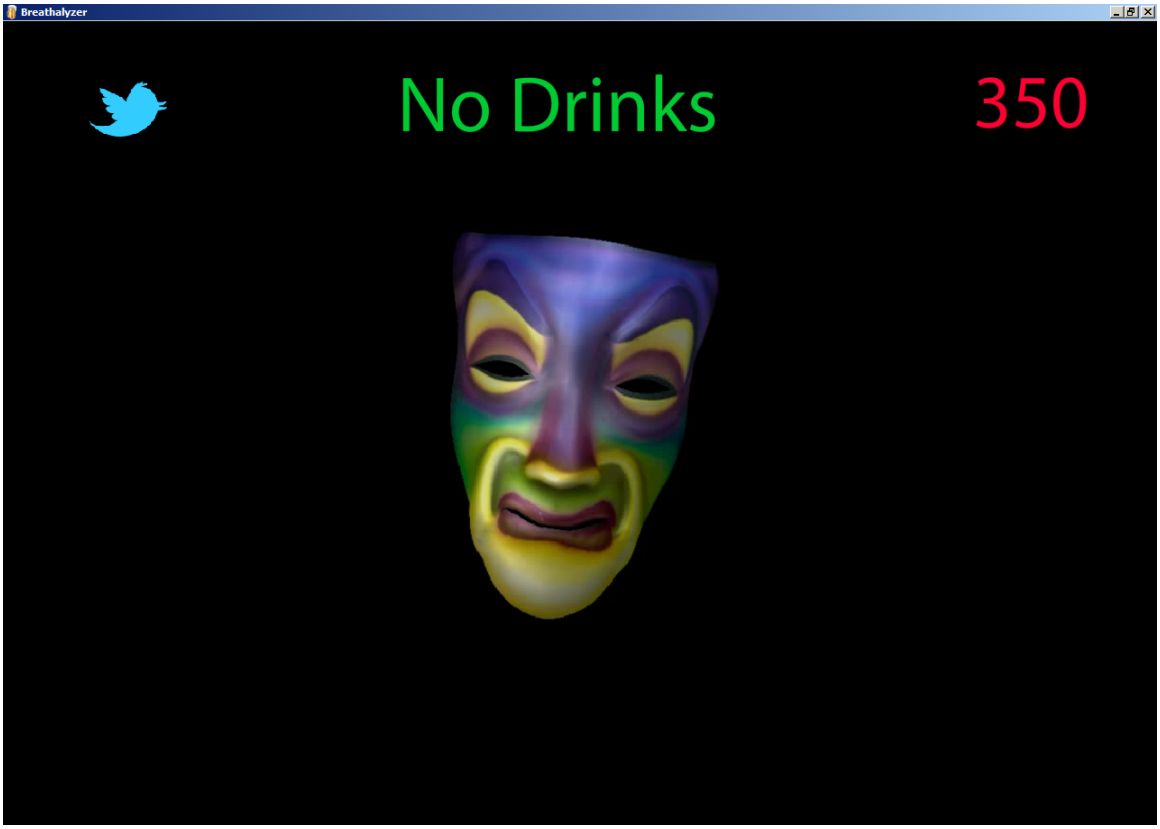
Using the Twitter feature, you can automatically Tweet your Breathalyzer results and/or have the Magic Mirror speak your Tweets. This feature is by default turned off.

Select "**ON**" next to Twitter Feature and then link your Twitter account by clicking "Link Twitter Account". Follow the prompts entering your Twitter username and password.

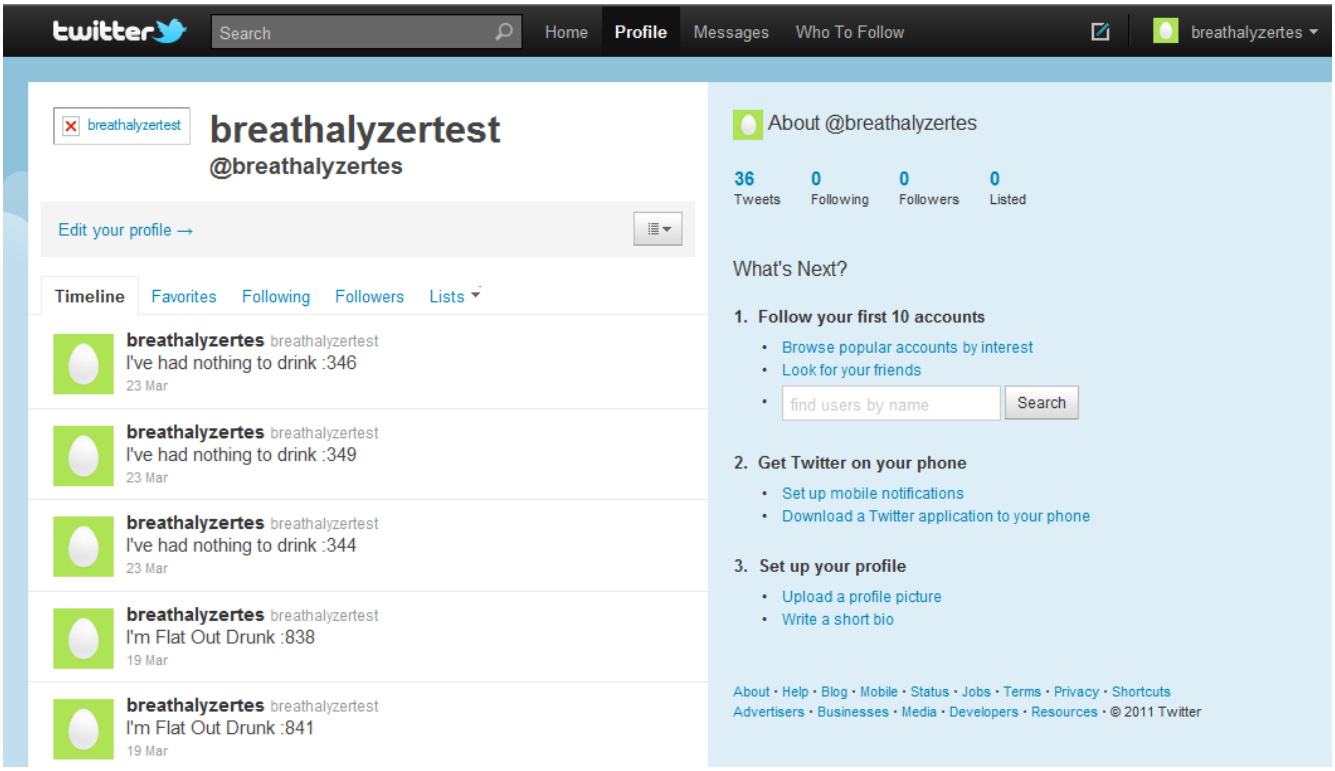




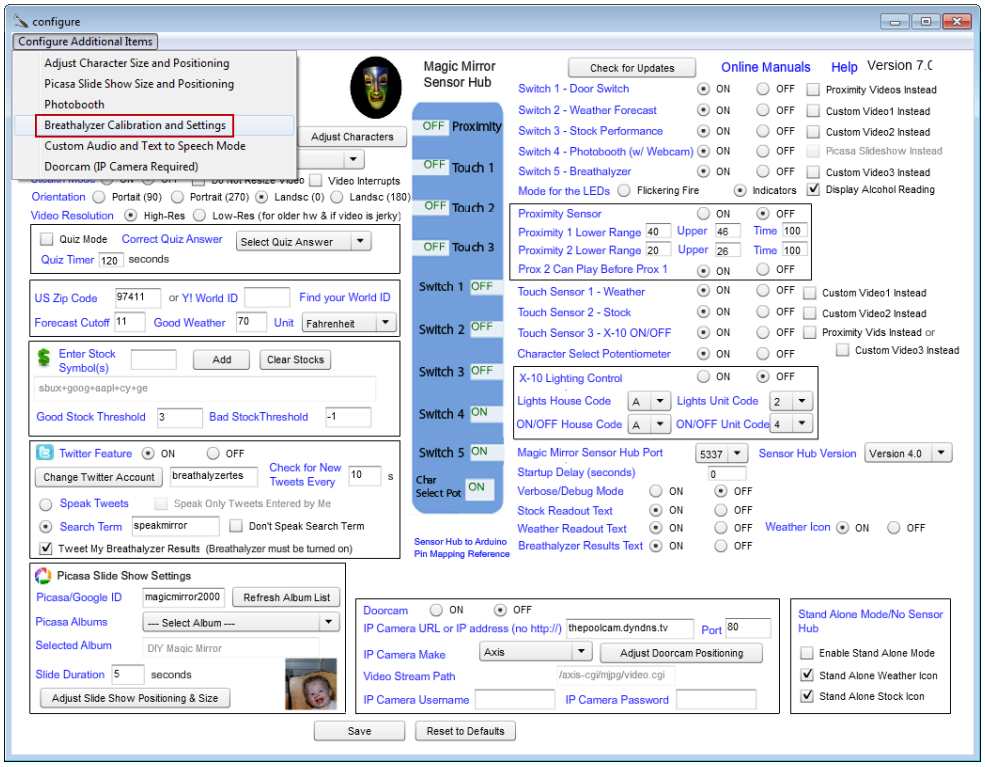
If Twitter is turned on, your Twitter account has been linked, and “Tweet My Breathalyzer Results” is checked, the Magic Mirror will send a Tweet of your results each time the Breathalyzer button is pressed. The Twitter bird will appear momentarily along with a notification sound letting you know the Tweet has been sent.



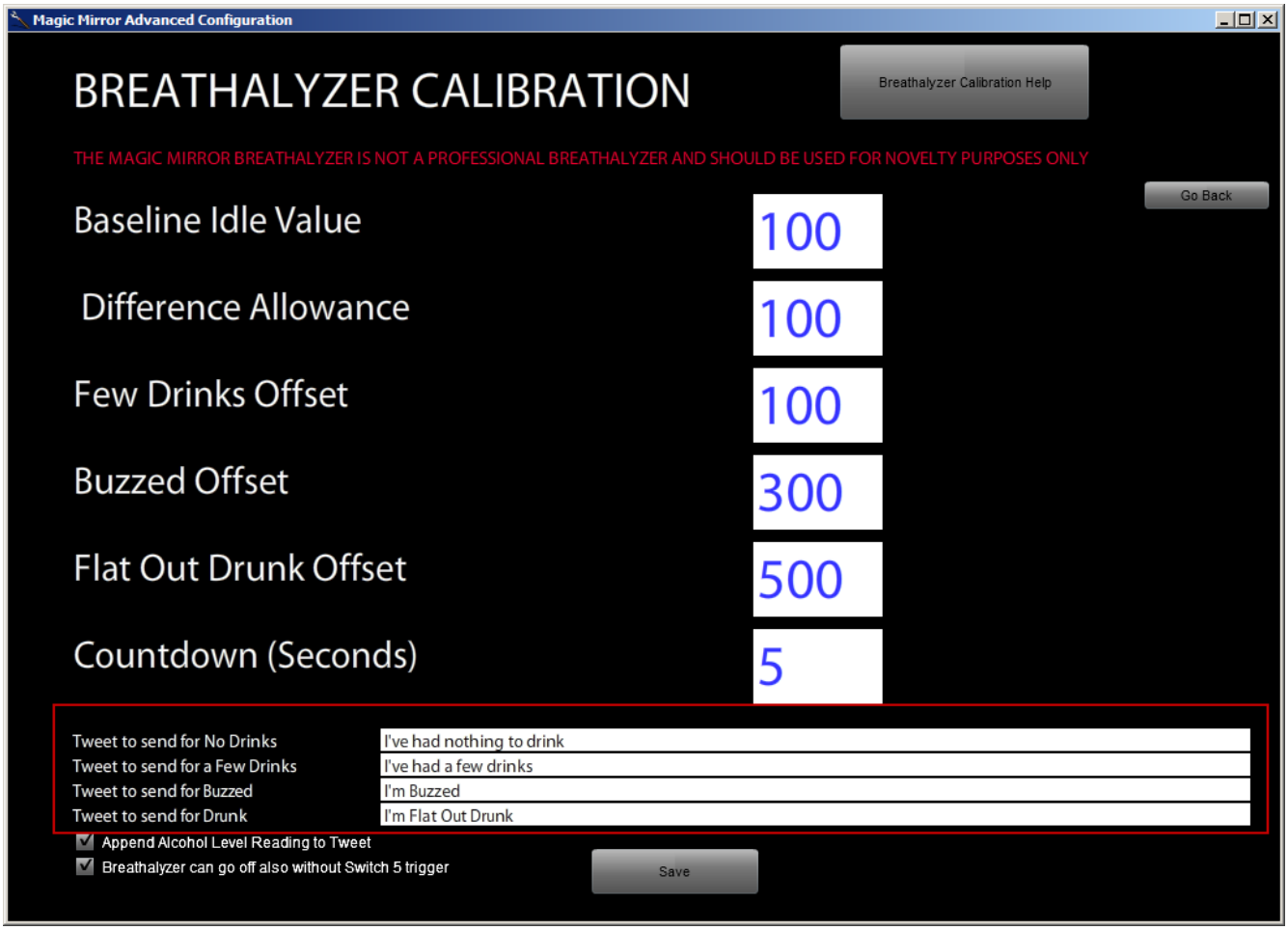
Tweets posted to your Twitter home page. You can customize the Tweet text and also decide whether or not to include the alcohol sensor value in the Tweet.



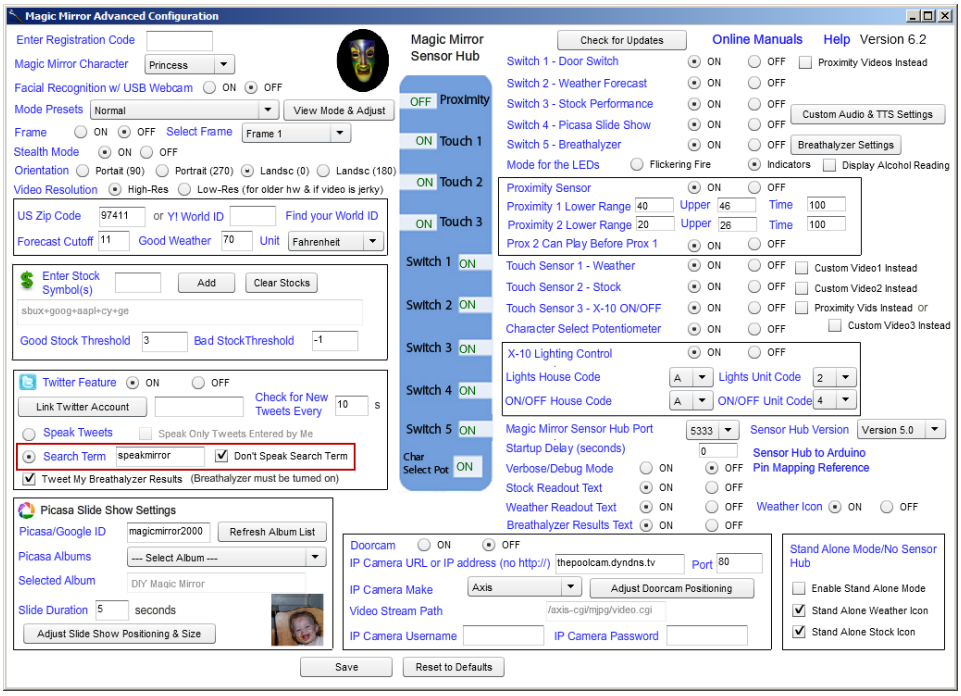
You may also customize the verbage of the Breathalyzer Tweets. Click "Configure Additional Items" and "**Breathalyzer Calibration and Settings**".



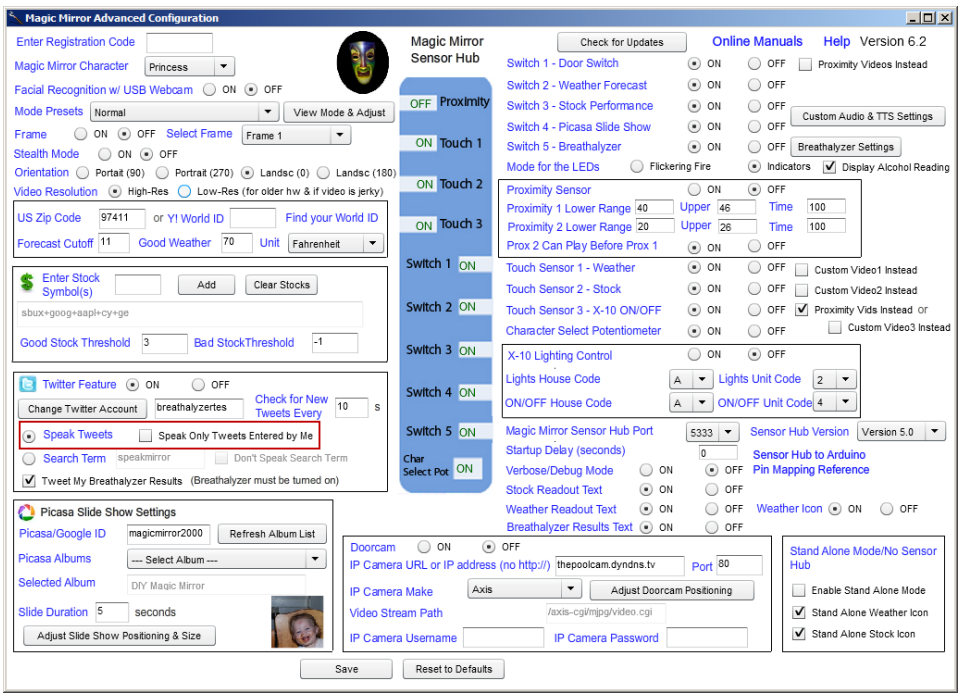
Modify the text as desired.



Using the default settings, the Magic Mirror will speak (using Text to Speech) any Tweet containing "speakmirror" while checking Twitter every 10 seconds. For example, the Tweet "speakmirror hello from the Magic Mirror" will result in the Magic Mirror speaking "hello from the Magic Mirror". You may also change the search term to any keyword you like. The Magic Mirror automatically filters out any word containing http:// so URLs are not spoken. Uncheck "Don't Speak Search Term" to have the Magic Mirror also speak the search term.

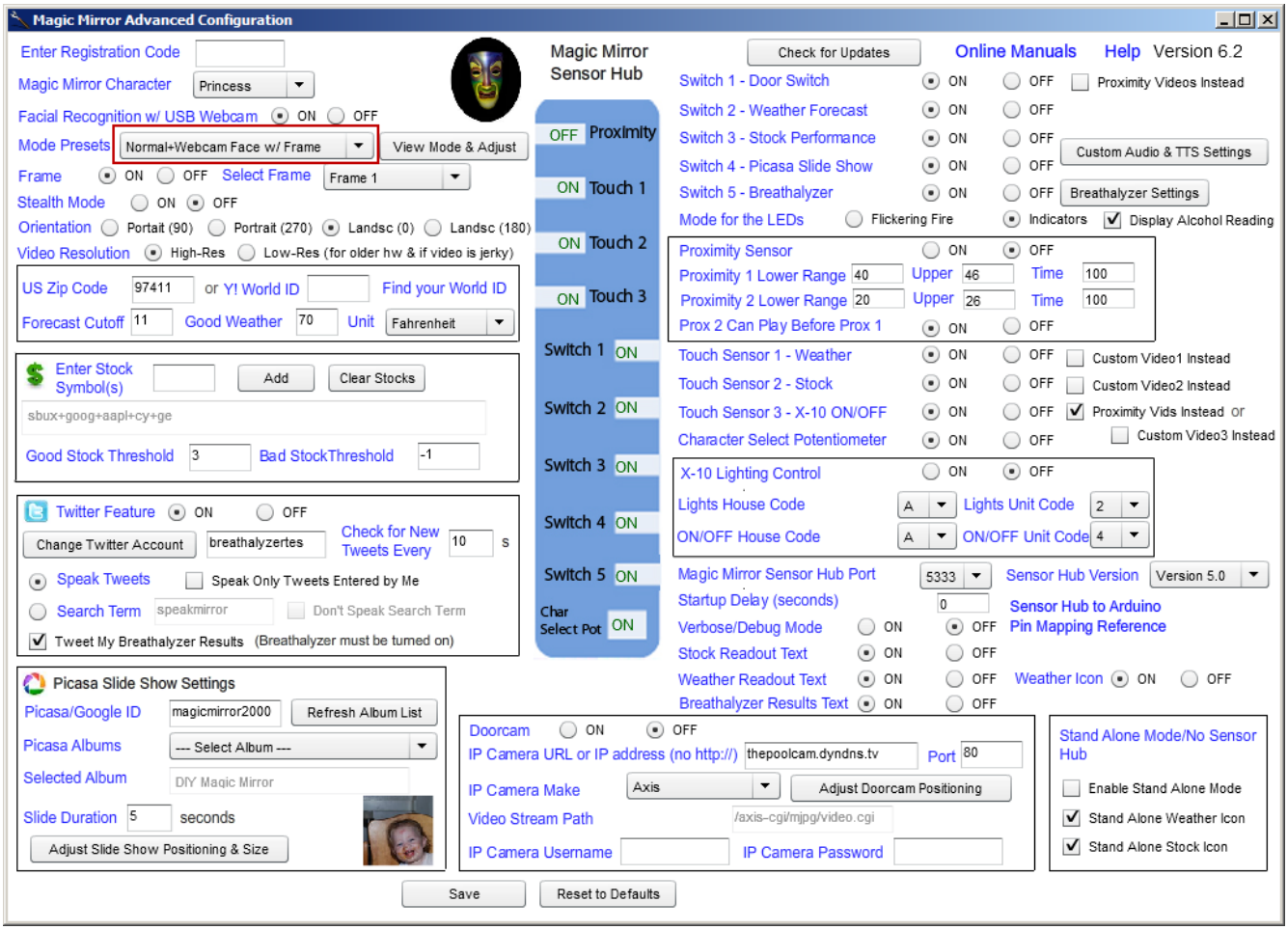


Alternatively, you may also enter your username and password to have the Magic Mirror speak Tweets from your Twitter account. Upon starting up, the Magic Mirror will speak your most recent Tweet and then per the "Check for New Tweets Every" setting (default is 10 seconds), speak any new Tweet. Checking "Announce Only My Tweets" will limits responses to just Tweets authored by you.

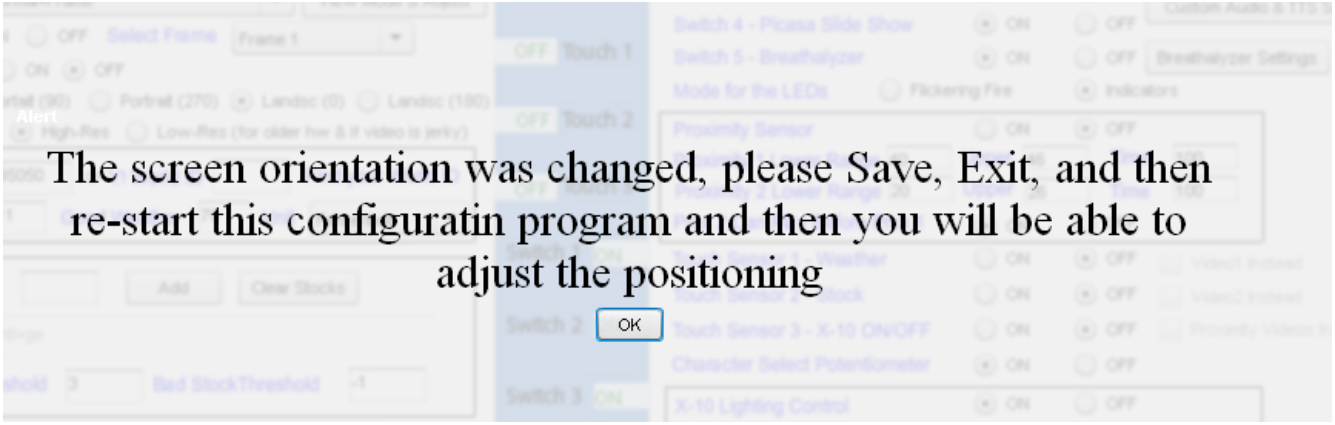


Webcam Facial Recognition

Using the feature, the Magic Mirror will play the same videos as it would from the proximity sensor when a face is detected from a USB connected webcam. From the Mode Presets dropdown, select "**Normal +Webcam Face w/ Frame**" to turn on this feature.

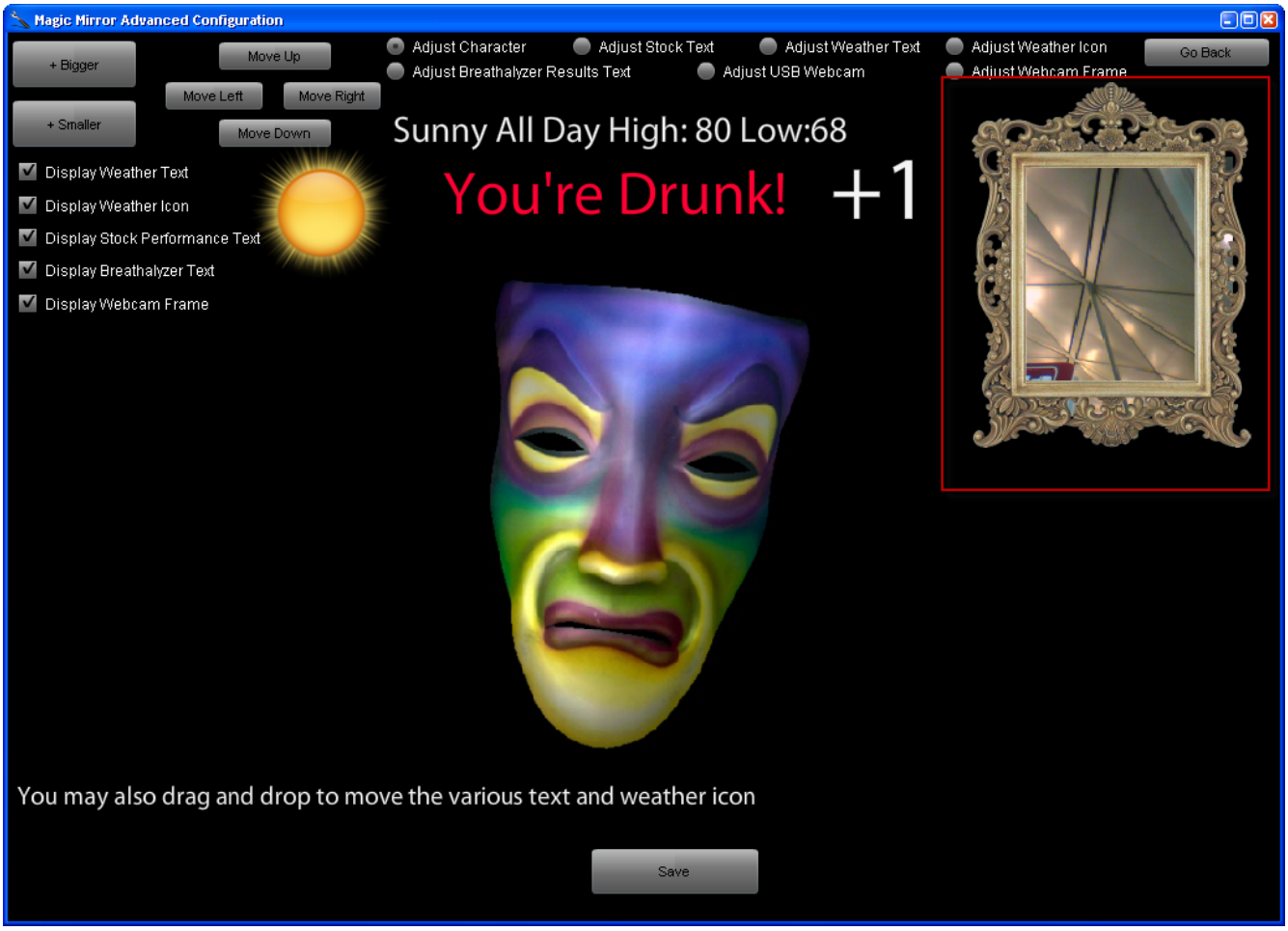


Then click the "**View Mode & Adjust" button**". You'll be prompted to re-start the configuration program.



Exit out and re-launch and click "**View Mode & Adjust**" again.

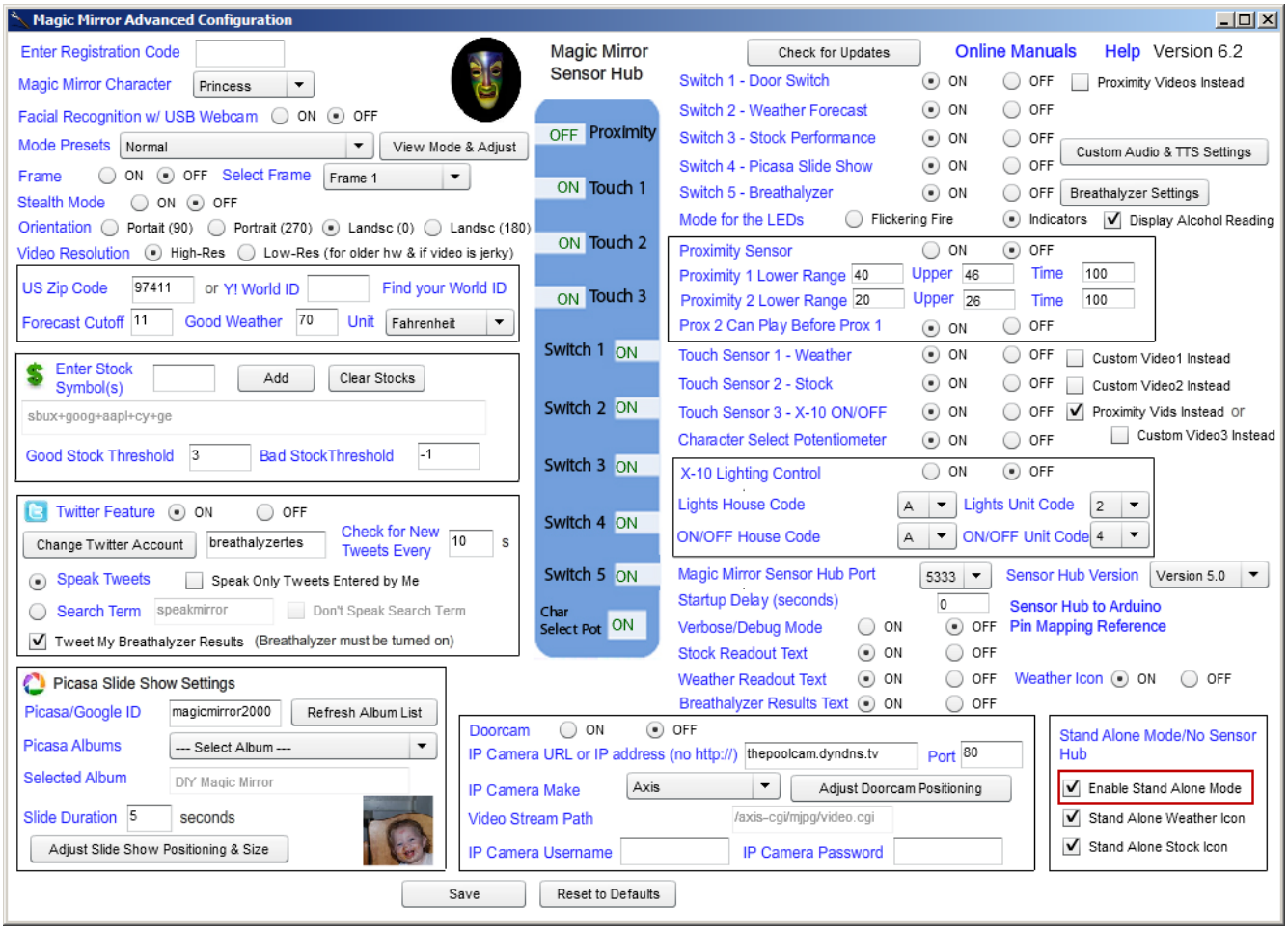
You should now see the webcam feed. You may also change the graphic for the picture frame or turn it off by unchecking "**Display Webcam Frame**".



Adjust the size and position of the webcam feed & frame to your liking and then save. When you run the Magic Mirror program, the proximity videos will now play when a face has been detected by the webcam.

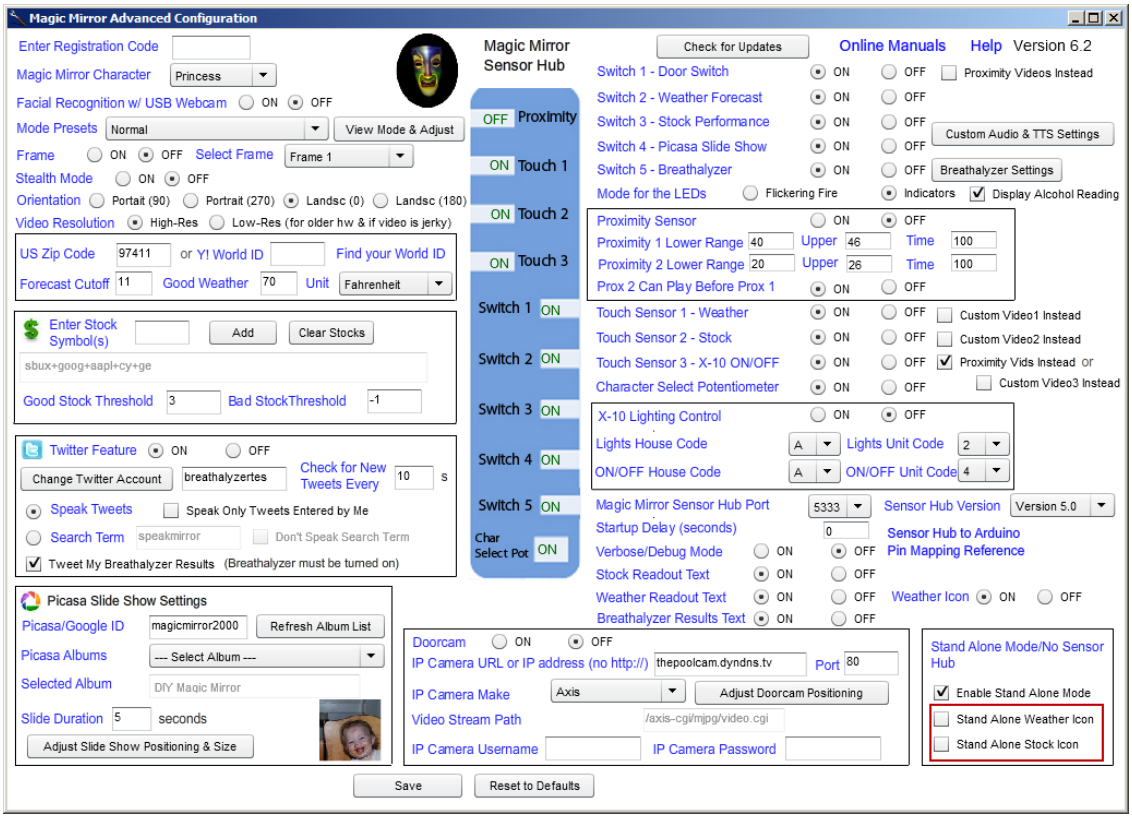
Stand Alone Mode

Check the “Enable Stand Alone Mode” box to run the Magic Mirror in stand alone mode meaning without a Sensor Hub/Arduino. None of the sensors (switches, touch, breathalyzer, proximity…) will function in this mode. You will however be able to use the webcam facial recognition feature, Twitter feature, and mouse clicks for Weather and Stock.



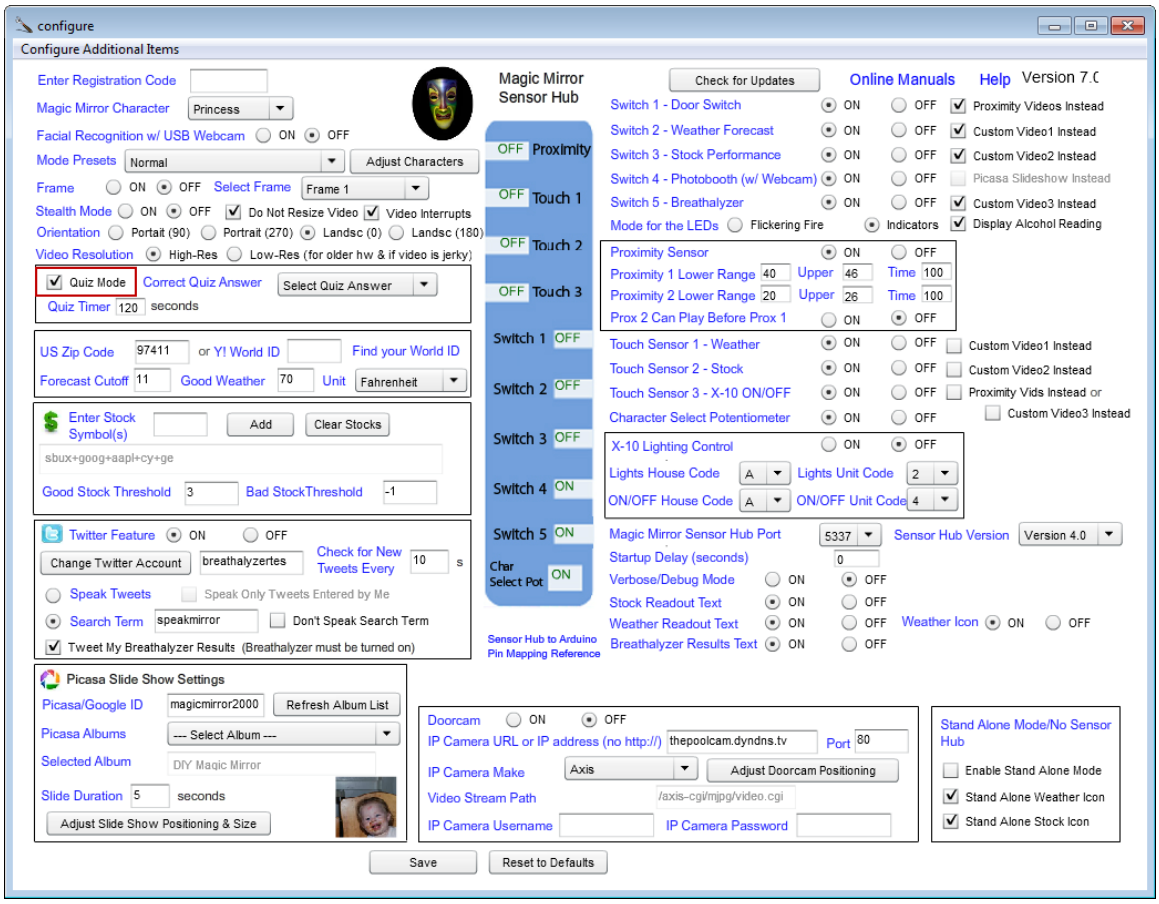
The Magic Mirror running in stand alone mode.

You may also turn off the stock and weather icons from the configuration program.



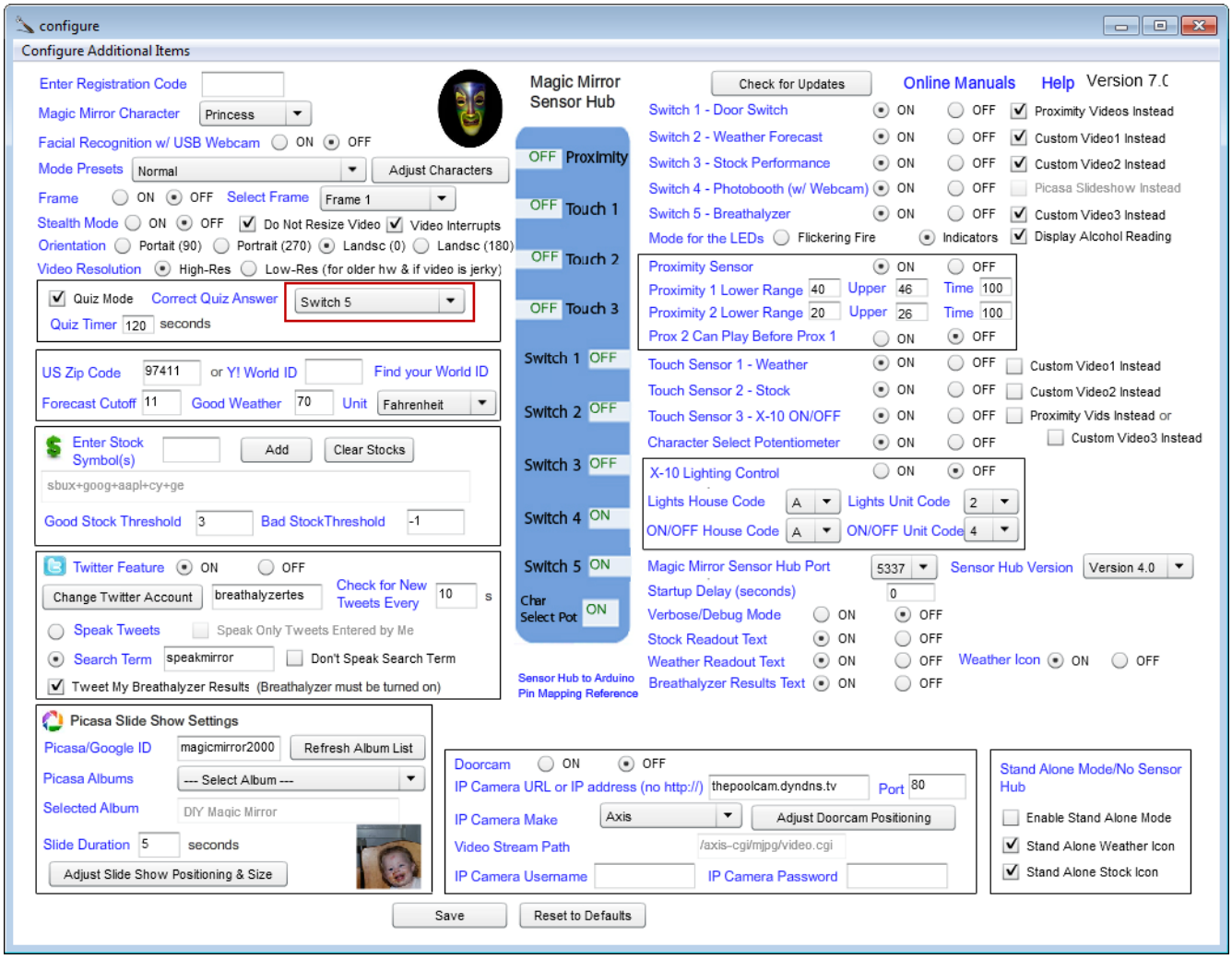
Quiz Mode

Quiz mode can be used for a question and answer scenario. Quiz mode support one question and three possible answers. Turn on quiz mode from the Advanced Configuration program.



Once quiz mode has been selected, the following configurations are made automatically, do not change these configurations while in quiz mode.

The answers are triggered by the inputs from Switch 2, Switch 3, and Switch 5. Now select which switch input should correspond to the correct answer. In the example below, Switch 5 is the correct answer.



Before you can use quiz mode, you'll need to copy some additional .flv video files into the "Install Directory\mirror\videos" directory following the file naming convention below. The videos directory for a Windows installation is: **C:\Program Files\DIY Magic Mirror\mirror\videos** or **C:\Program Files (x86)\DIY Magic Mirror\mirror\videos** for 64-bit Windows.

Mode	File Name	Function
Princess	video1_princess.flv video2_princess.flv video3_princess.flv proximity1_princess.flv video4_princess.flv quizloop_princess.flv *	Correct answer or incorrect answer Correct answer or incorrect answer Correct answer or incorrect answer Clue Question Ready to Answer question Video that loops after question has been asked and after wrong answer
Pirate	video1_pirate.flv video2_pirate.flv video3_pirate.flv proximity1_ pirate.flv video4_pirate.flv quizloop_pirate.flv *	Correct answer or incorrect answer Correct answer or incorrect answer Correct answer or incorrect answer Clue Question Ready to Answer question Video that loops after question has been asked and after wrong answer
Halloween	video1_halloween.flv video2_halloween.flv video3_halloween.flv proximity1_ halloween.flv video4_halloween.flv quizloop_halloween.flv *	Correct answer or incorrect answer Correct answer or incorrect answer Correct answer or incorrect answer Clue Question Ready to Answer question Video that loops after question has been asked and after wrong answer
Insult	video1_insult.flv video2_insult.flv video3_insult.flv proximity1_ insult.flv video4_insult.flv quizloop_insult.flv *	Correct answer or incorrect answer Correct answer or incorrect answer Correct answer or incorrect answer Clue Question Ready to Answer Question Video that loops after question has been asked and after wrong answer
Custom Audio	video1_tts.flv video2_tts.flv video3_tts.flv proximity1_tts.flv video4_tts.flv quizloop_tts.flv *	Correct answer or incorrect answer Correct answer or incorrect answer Correct answer or incorrect answer Clue Question Ready to Answer Question Video that loops after question has been asked and after wrong answer

IMPORTANT: The quizloop_*character.flv videos must have a navigation cue point called idle_end or these videos will not loop. See the section "**Customizing the Magic Mirror with your own Videos**" for instructions to create this cue point.

The proximity2_*character*.flv and proximity3_*character*.flv video files are not used in quiz mode so you don't need to over-write those.

Note: If you are using one particular character only, then you'll need to just over-write the video files for just that character.

The flowchart below illustrates the flow of quiz mode and which video files play corresponding to which sensor inputs. In this example flow, **Switch 5** was selected in the Advanced Configuration program as the correct answer.

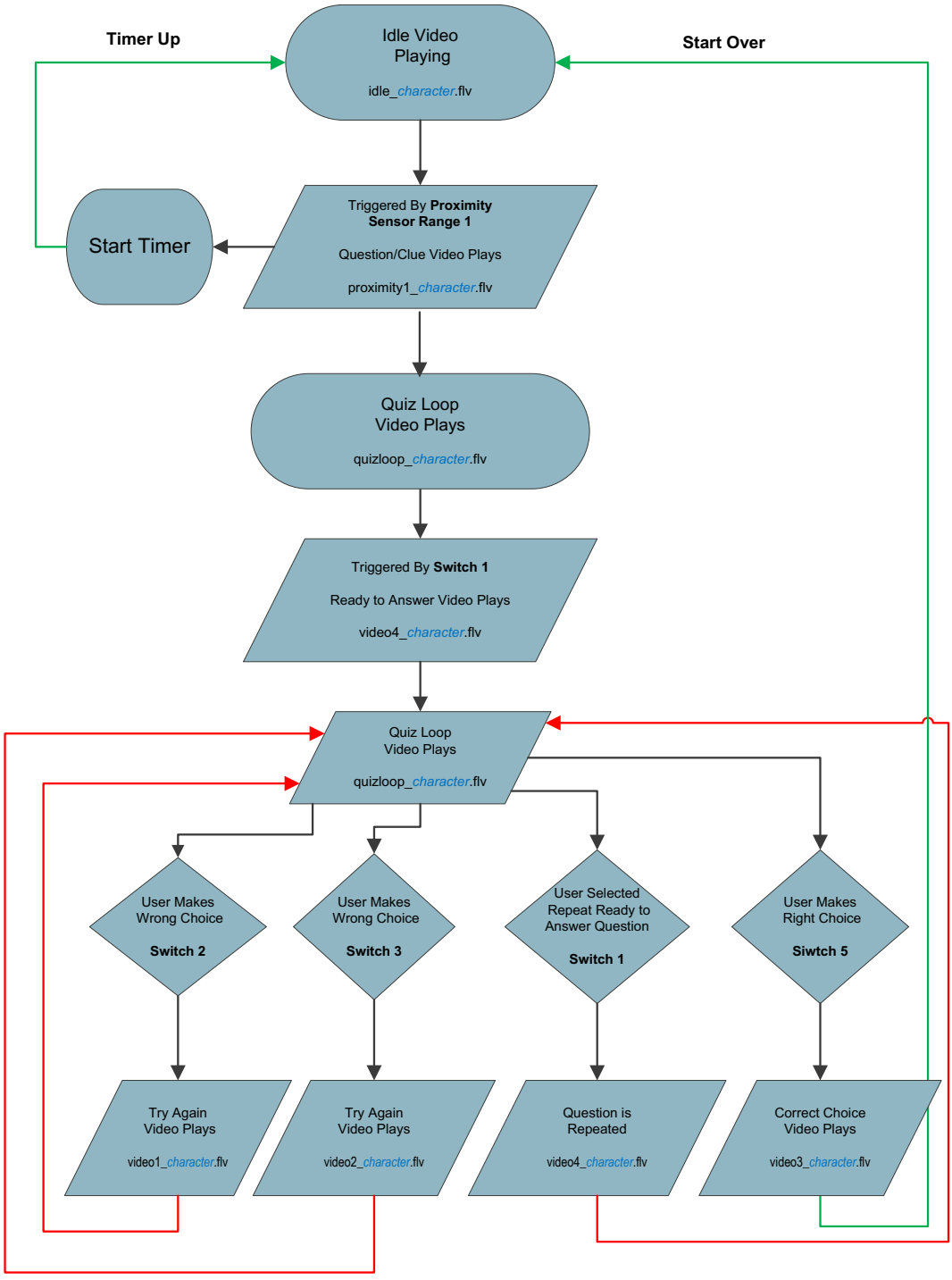


Figure 6 – Quiz Mode Flow

Proximity Sensor Range 2 is not used for quiz mode, only proximity sensor range 1 triggers the quiz question video.

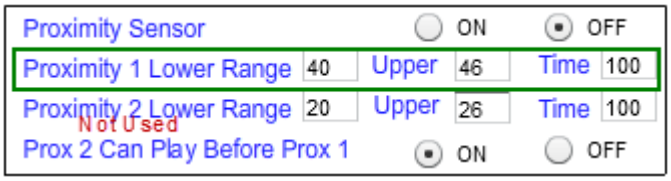
In the example shown in Figure 6 with the correct answer set to **Switch 5**, the following file names should be used:

Video Function	**Video File Name**
Initial Quiz/Clue Question Video (From Proximity Sensor)	proximity1_*character*.flv
Ready to Answer Question Video (From Switch 1)	video4_*character*.flv
Correct Answer Video	video3_*character*.flv
Wrong Answer Video	video1_*character*.flv and video2_*character*.flv
Video loop that plays while waiting for the user to select the correct answer	quizloop_*character*.flv

character = princess, pirate, halloween, insult, and tts

While in quiz mode, the answer videos will not play until the question has played the "Ready to Answer Question Video" from **Switch 1**.

Only proximity range 1 is used in quiz mode, proximity range 2 is not used.



While in quiz mode, the answer videos will not play until the "Ready to Answer Question Video" has finished playing.

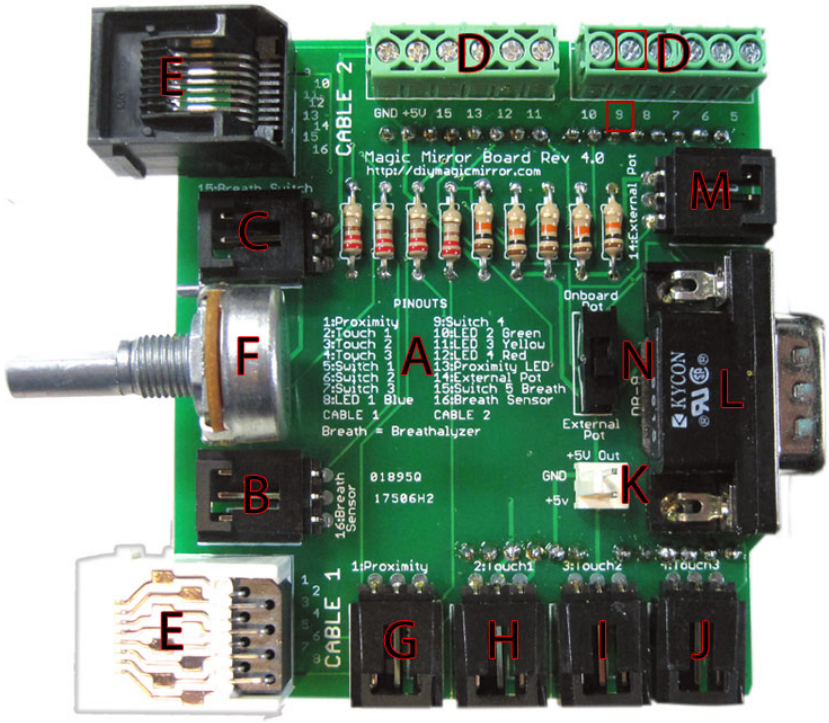
There is no text to speech or customer MP3 capability for quiz mode, only custom videos can be used.

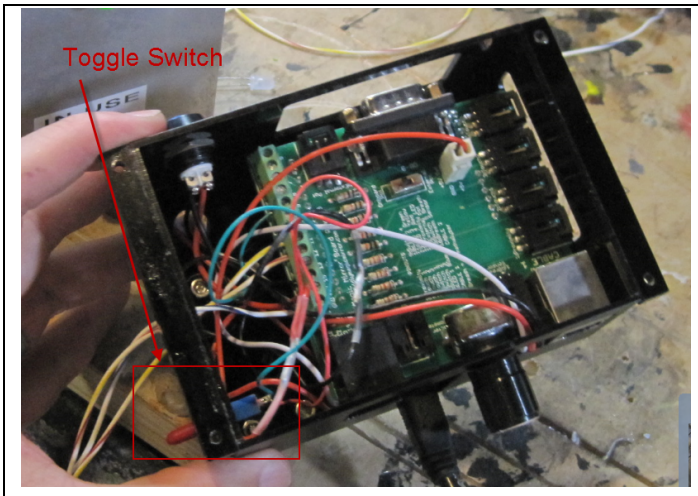
While the "Ready to Answer Question Video" can be repeatedly triggered via **Switch 1**, the quiz question video triggered by the proximity sensor plays only once. This is so the question video does not keep playing over and over while the user is standing in front of the proximity sensor thinking about the answer.

The touch sensors will functional as normal during quiz mode.

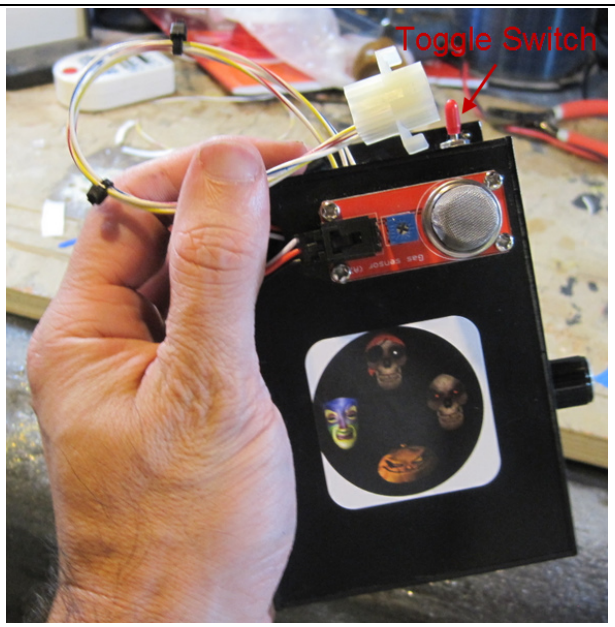
Photobooth Feature

To use the Photobooth feature, a toggle switch (not a momentary switch) must be wired up to the Magic Mirror Sensor Hub. The easiest way to do this is to use the screw terminals connections and wire one end of the toggle switch to Pin 9 on the screw terminal block (D in the diagram below) and the other end of the toggle swtich to +5V on the screw terminal.

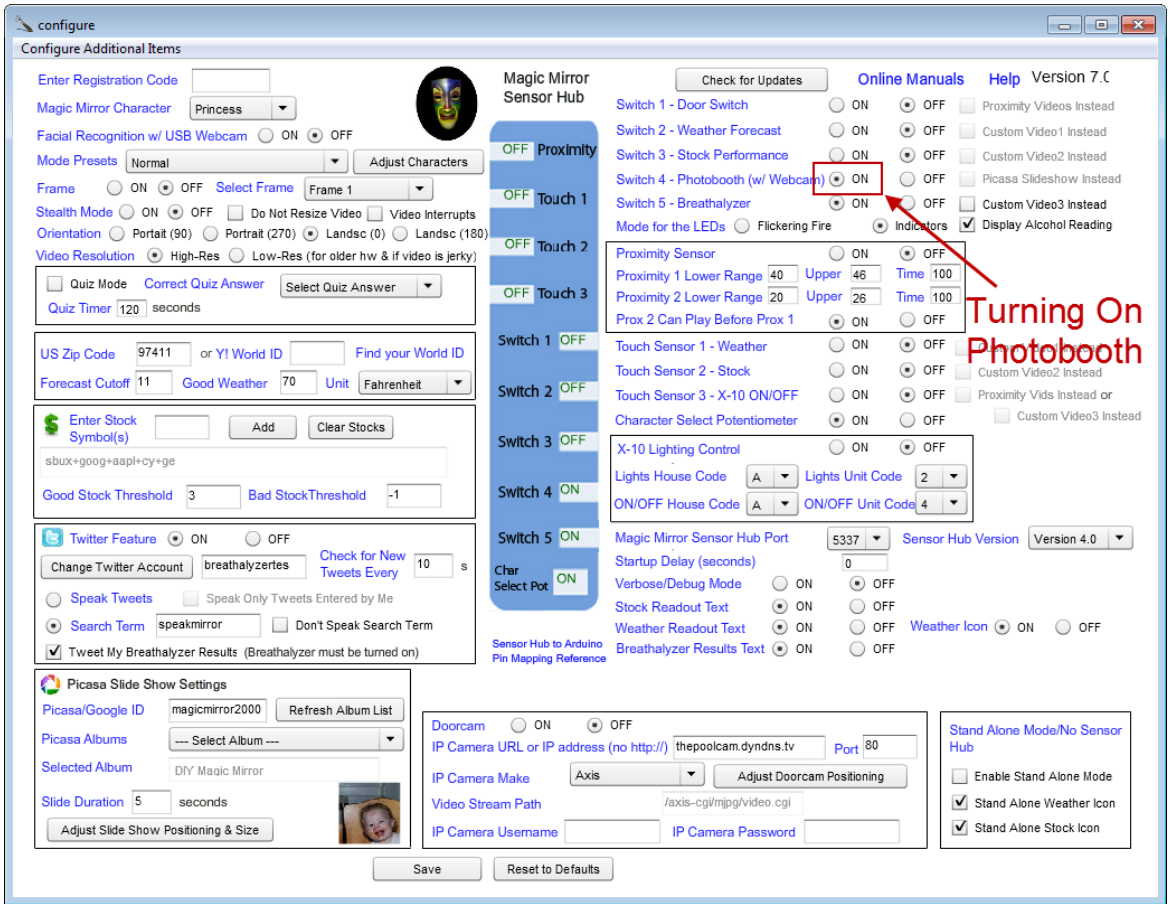




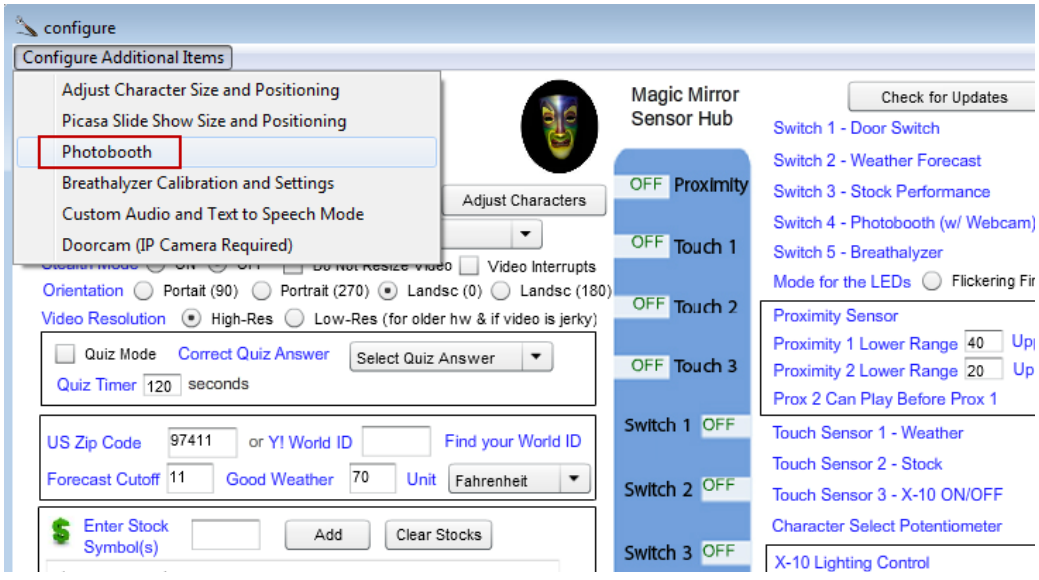
In this example, the toggle switch is attached to the Magic Mirror Sensor Hub case but it can also be mounted somewhere else externally in your installation.

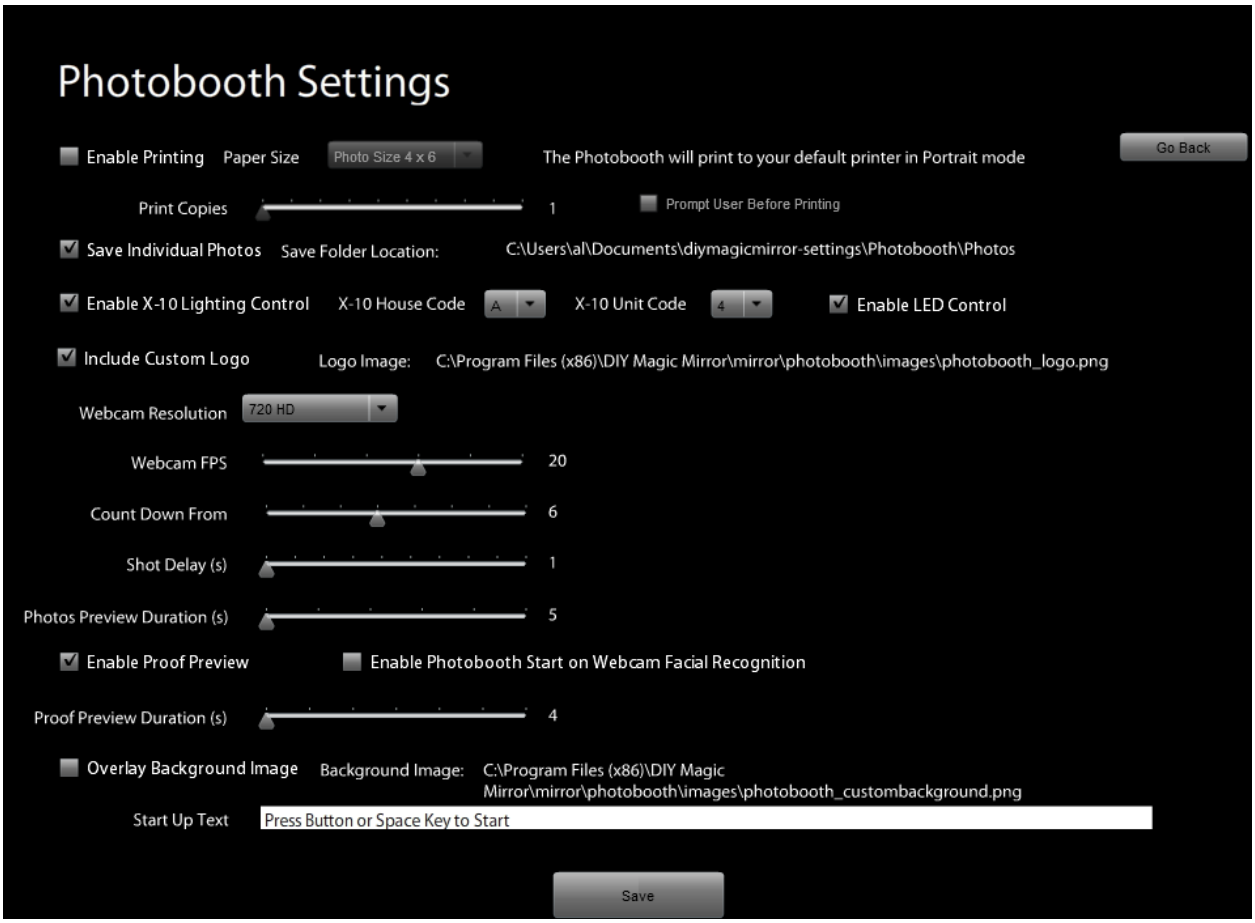


To turn on the Photobooth feature, launch the Advanced Configuration program and select “ON” for “Switch 4 – Photobooth (w/ Webcam)”. The Photobooth requires a webcam to take the pictures, you’ll get the best results with an HD Webcam.



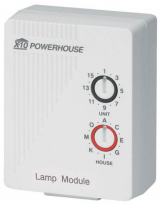
To customize the Photobooth, select “Configure Additional Items”, and then click “Photobooth”.





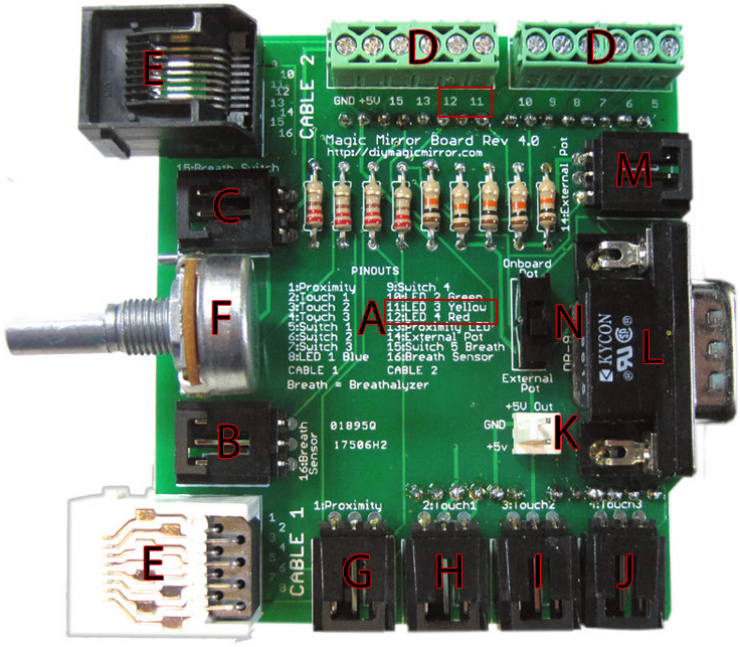
Check “Enable X-10 Lighting Control” to turn on the lighting control feature. For this feature, you’ll need the X-10 components below (purchased separately). Be sure and also match the X10 house and unit code address on the X-10 modules with the “X-10 House Code” and “X-10 Unit Code” in the configuration program. The default address is A4.

With the lighting control feature enabled, the lamp plugged into the LM465 Lamp Module will turn on when the Photobooth start button has been pressed (during the countdown) and then when the last picture has been taken, the lamp will automatically turn off.

X-10 Plug-in RF Base	X-10 Firecracker CM17A	X-10 LM465 Lamp Module
		
Receives the X-10 commands over RF from the Sensor Hub.	Plugs into the Magic Mirror Sensor Hub, sends X-10 RF commands to the X-10 Plug-in RF Base	Plug a lamp into the LM465

Check “Enable LED control” to turn on the LED control feature. Two LEDs can be wired to indicate when the Photobooth is idle and when it is in use. The idle LED is LED 3 (pin 11 on the screw terminal block) and the in use LED is LED 4 (pin 12 on the screw terminal block).

Example LED indicator box for the Photobooth. The green LED means the Photobooth is in idle mode and the red LED means the Photobooth is in use.



Wire the long lead of the idle LED to Pin 11 and the long lead of the In Use LED to Pin 12 on the screw terminal block. Then wire the two short leads of the LEDs together and then connect to the GND connection on the screw terminal block.

If “Enable Printing” is checked, the Photobooth will print to your default printer. Paper sizes of 4 x 6 inches and 8.5 x 11 inches are supported.

If “Saved Individual Photos” is checked, the Photobooth will save pictures to the indicated file path.

If “Include Custom Logo” is checked, the Photobooth will display the logo in the upper left hand corner. To add your own logo, simply over-write this file with your own logo. Ensure the replacement file is exactly the same image dimensions.

Select the Webcam Resolution corresponding to your webcam. The higher the resolution will produce better pictures and prints.

Webcam FPS is the frames per second. Leave the default of 20 unless you are experiencing sluggish webcam video in which case you can reduce.

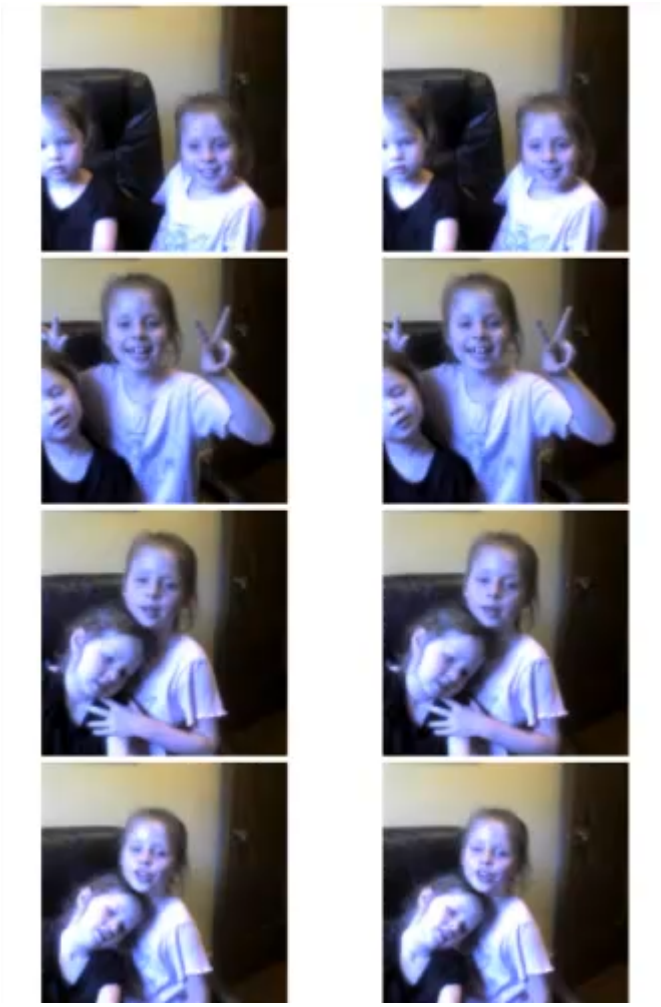
“Count Down From” is the countdown time in seconds after the keyboard or button has been pressed to start the Photobooth.

Increase “Shot Delay” if you want an additional delay in between photo takes.

“Photos Preview Duration” is the length of time the Photobooth will display the all photos together after they’ve been taken.

“Enable Photobooth Start on Webcam Facial Recognition” will set the Photobooth to start when the Webcam recognizes a face. Note this feature is still a bit experimental, someones it will trigger when there is no face. “Proof Preview Duration” is how long the photostrip proof is displayed.

If you’d like to add a custom image to the phtostrip print, then check “Overlay Background Image”. Replace the background overlay image with your own file and ensure to keep exactly the same image size dimensions.

If “Overlay Background Image” is checked, the printout will look like this:	If “Overlay Background Image” is not checked, the printout will look like this:
	

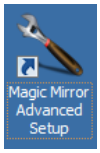
You may customize the start up text that is displayed in the Photobooth by editing the “Start Up Text” field.

Simply flip the toggle switch to change to Photobooth mode. When done, flip the toggle switch again to return to Magic Mirror mode. There are four characters also in the Photobooth. Select the desired character while in Magic Mirror mode and then toggle the switch for Photobooth mode and that character will be selected in Photobooth mode.

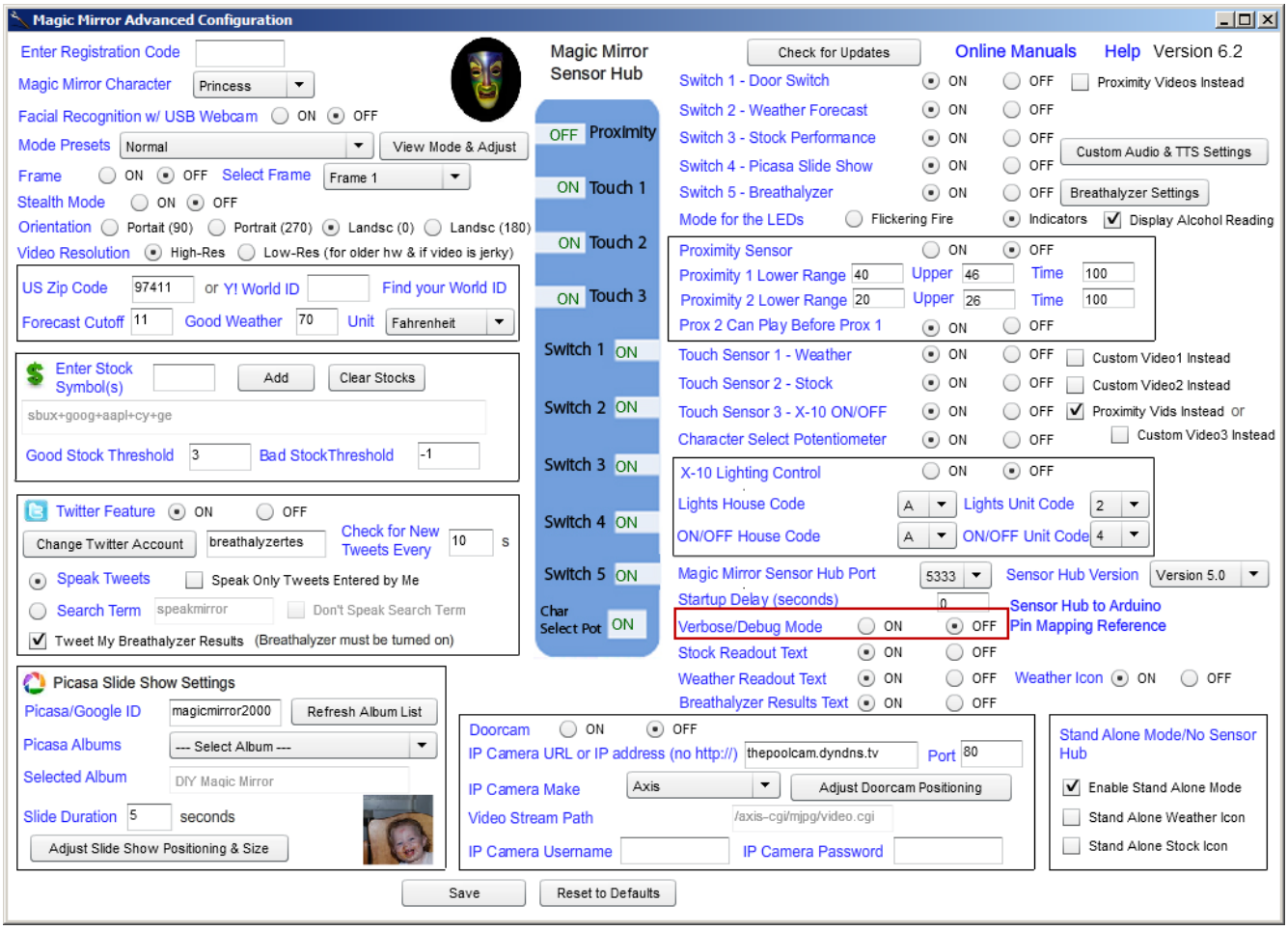
Either press the space key on your keyboard or the Breathalyzer button to initiate the Photobooth.

Setting the Magic Mirror for Permanent Operation

You are now ready to set the Magic Mirror for permanent operation.

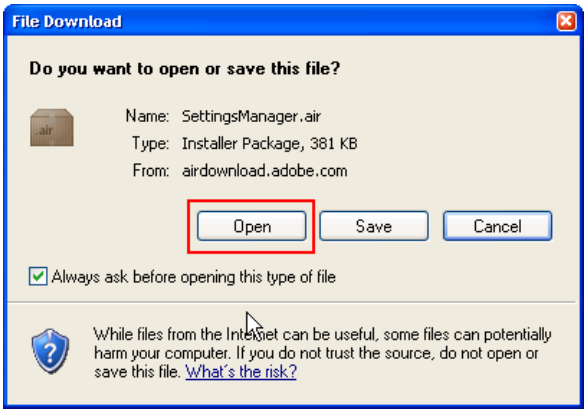
Launch “Magic Mirror Advanced Setup” 

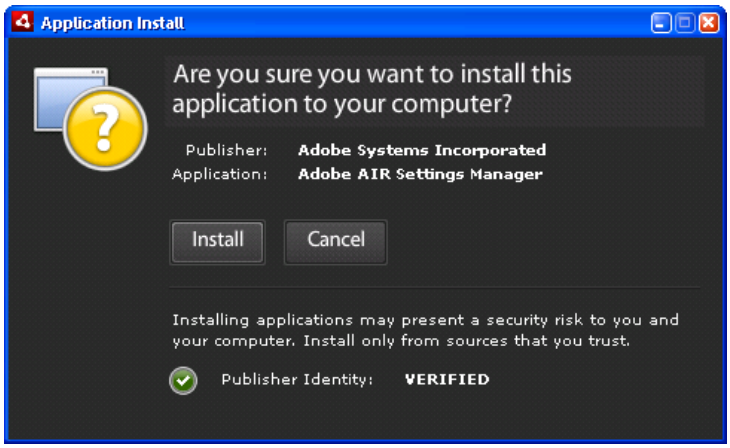
and set Verbose Mode to **OFF**.

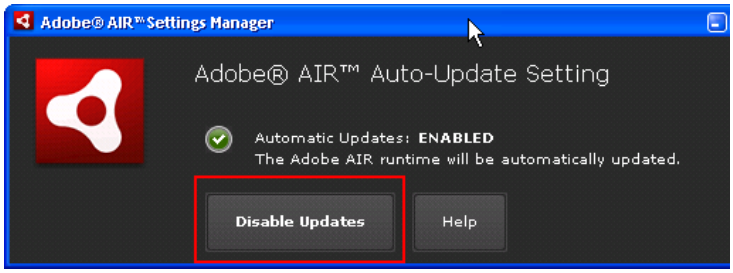


Add a shortcut to “Run Mirror.exe” on the PC or to “mirror” on the Mac and Linux to your Start-Up Folder and then Re-Boot.

If you haven’t already done so, turn off Adobe AIR automatic updates by installing http://airdownload.adobe.com/air/applications/SettingsManager/SettingsManager.air and then clicking “Disable Updates”. If you do not do this, you’ll get an annoying Adobe AIR upgrade prompt every so often.







Chapter 4

Configuration Settings

Configuration Settings

Enter Registration Code: Enter your registration code here to clear the demo box.

Sensor Hub Version: If you built the Sensor Hub yourself, then leave the default. Default: Version 3.0

Arduino Version: Set to ATMega168 if your Arduino uses the ATMega168 chip or ATMega328 if your Arduino uses the ATMega328 chip. Purchased Magic Mirror Sensor Hubs use the ATMega328.

Magic Mirror Mode: Sets the Magic Mirror to Princess, Pirate, Halloween, or Insult Mode. If wired up, the Character Select Potentiometer will over-ride this setting.

Idle Videos: Set Idle Videos to OFF to run the Magic Mirror in stealth mode meaning that videos will play only when a sensor has been triggered. Use this if you need the element of surprise in your installation. Default: ON

Weather Zip Code: Enter your zip code to be used for the weather forecast.

Unit of Measure: Weather unit of measure, pick Fahrenheit or Celsius. Default: Fahrenheit

Forecast Cutoff: If the current time is before this time (military 24 hr), the current day forecast is used and if the current time is after, tomorrow's forecast is used. For the default of 11, if the current time is before 11:00 AM, the current day forecast will be used. If the current time is after 11:00 AM, then tomorrow's forecast will be used. Default: 11

Good Weather Threshold: The temperature that defines a sunny day which triggers the good weather video. With the default settings of 70, the good weather video will play if the temperature forecast is 70 or above. Default: 70

Video Resolution: Set to low-res if you are running on older PC hardware and the video is sluggish. Default: High-Res

Orientation: Sets the Magic Mirror to Portrait or Landscape mode. Default: Portrait 90

Enter Stock Symbol: Enter as many stock symbols as you like, you can also enter just one stock too.

Good Stock Threshold: Threshold for good stock performance. If set to 3, then the good stock video will play if the sum gain of your portfolio is 3 or greater.

Bad Stock Threshold: Threshold for bad stock performance. If set to -1, the bad stock video will play if the sum decrease of your portfolio is -1 or less. If it's in between this and the good stock threshold, then the ok stock video will play.

Picasa/Google ID: If using the Slide Show Feature (Digital Switch 4), enter your Picasa/Google username

Picasa Albums: Displays your Picasa Albums, pick one to use for the Slide Show Mode

Slide Duration: Amount of time in seconds before the next Picasa picture is displayed. Default: 10

Switch 1 - Door Video: Hook up to any on/off switch. Plays a video letting you know someone is at the door.

Switch 2 - Weather Forecast: Hook up to any on/off switch (toggle or momentary), plays the weather forecast

Switch 3 - Stocks: Hook up to any on/off switch (toggle or momentary), reports stock performance

Switch 4 - Picasa Slide Show: Turn On if using the Picasa Slide Show feature. This switch must be a toggle on/off switch (standard light switch, reed switch) and cannot be a momentary on/off switch. The slide show will play when the switch is off and will return to normal Magic Mirror mode when the switch is on.

Switch 5 - Breathalyzer: Turn On if using the Breathalyzer function, both the alcohol sensor and this switch must be connected

X-10 Lighting Control: On Turns on the X-10 lighting control, Off turns off

Lights House Code: Select a letter between A and P that matches the X-10 house code on your X-10 device.

Lights Unit Code: Select a number between 1 and 16 that matches the X-10 unit code on your X-10 device. The combination of house code and unit code is the device X-10 address (Ex. A2).

ON/OFF House Code: Touch Sensor 3 triggers this. Select a number between 1 and 16 that matches the X-10 unit code on your X-10 device. The combination of house code and unit code is the device X-10 address (Ex. A4).

ON/OFF Unit Code: Touch Sensor 3 triggers this. Select a number between 1 and 16 that matches the X-10 unit code on your X-10 device. The combination of house code and unit code is the device X-10 address (Ex. A4).

Proximity Sensor: On turns on the Proximity Sensor. Set to Off if the proximity sensor is not hooked up.

Proximity 1 Lower Range: The lower distance range in roughly inches for the proximity sensor to trigger the first proximity video.

Proximity 1 Upper Range: The upper distance range in roughly inches for the proximity sensor to trigger the first proximity video.

Proximity 1 Time: How long the subject stands within the lower and upper distance limit before triggering the proximity 1 video, 100 is approx. 3 seconds. If 6 seconds is desired, then use 200. Default: 100

Proximity 2 Lower Range: The lower distance range in roughly inches for the proximity sensor to trigger the second proximity video.

Proximity 2 Upper Range: The upper distance range in roughly inches for the proximity sensor to trigger the second proximity video.

Proximity 2 Time: How long the subject stands within the lower and upper distance limit before triggering the proximity 2 video, 100 is approx. 3 seconds. If 6 seconds is desired, then use 200. Default: 100

Prox 2 Can Play Before Prox 1: If set to ON, either proximity video will play depending on which distance range was triggered. If set to OFF, the first proximity video must play before the second proximity video. Default: ON

Touch Sensor 1 – Weather Forecast: On turns on Touch Sensor 1. Set to Off if this input is not hooked up to a Touch Sensor.

Touch Sensor 2 - Stocks: On turns on Touch Sensor 2. Set to Off if this input is not hooked up to a Touch Sensor.

Touch Sensor 3 – X10 ON/OFF: On turns on Touch Sensor 3. Set to Off if this input is not hooked up to a Touch Sensor. This will send an X-10 command to the X-10 ON/OFF address.

Character Select Potentiometer: Yes enables the mirror mode (Princess, Pirate, Halloween, or Insult) to be selected on the fly via the potentiometer which will override the above mirror mode software setting. If set to no, then the mirror mode is selected via the above mirror mode software setting and cannot be changed on the fly.

Magic Mirror Sensor Hub Port: The Sensor Hub network/com port. PC users use 5332 for com2, 5333 for com3, 5334 for com4 and so on. Mac and Linux users will always set to 5333. IMPORTANT: YOU MUST ENTER THIS CORRECTLY

Startup Delay (seconds): Delays program execution. Only change in case of sensor timing issues. Default: 0

Verbose: Yes turns on verbose mode which shows the sensor readings, you'll use this during installation and sensor calibration. Once done, set to no for normal operation.

Stock Readout Text: Displays a numeric stock performance readout with the stock video. For example, if your stock portfolio was up +3.2 for the day, then 3.2 will display when the stock video plays. The text will be in green if the gain/loss was in the Good Stock Threshold range, white for little or no change, and red if within the Bad Stock Threshold range. Default: On

Weather Readout Text: Displays a brief text forecast while the weather video plays. Default: On

Weather Icon: Displays a weather icon corresponding to the weather forecast while the weather video plays. Default: On

Doorcam: If set to On and Switch 1 – Door Switch is also set to On, an IP camera video feed will appear along with the door switch video.

IP Camera URL or IP address: Enter the web address of the desired IP camera feed. IMPORTANT: Do not enter "http://" in front of the address.

Port: The network port of the IP camera feed.

IP Camera Make: The manufacturer of the IP camera. The webcam feed varies by manufacturer so you must set this correctly.

Video Stream Path: You will only need to enter this if the IP Camera Make is set to "Other"

IP Camera Username: Only if the IP Camera requires a username and password to view.

IP Camera Password: Only if the IP Camera requires a username and password to view.

Baseline Idle Value: After hooking up the Breathalyzer, set the configuration program and run the Magic Mirror in verbose mode. While in verbose mode, look for the Alcohol Sensor box and then enter the idle/steady state value when no alcohol is near the Breathalyzer. The value you enter does not need to be exact. When the Breathalyzer run each time, it will obtain a new baseline value (when no alcohol is present) dynamically. Default: 100

Reset Difference Allowance: When the Breathalyzer has detected alcohol, it can take awhile (more than 5 minutes in some cases) for the alcohol sensor to reset back to the original Baseline Idle Value. To save time and because the Breathalyzer will obtain a new baseline value dynamically each time, it is not necessary that the alcohol sensor reset all the way back to the Baseline Idle Value. This setting determines how close the alcohol sensor readings needs to be before the next Breathalyzer reading can take place. For example, with the default Baseline Idle Value set to 100 and if the Reset Difference Allowance is set to 100, then the Breathalyzer will be ready for the next reading when the value is 200 or below. Default: 100

Few Drinks Offset: Default: 100

Buzzed Offset: Default: 300

Flat Out Drunk Offset: Default: 600

Countdown (Seconds): Amount of time in seconds for the subject to blow into the Breathalyzer. Default: 8

Output LEDs (Optional)

LED	Sensor Hub Pin	Indicator Mode	Flickering Fire Mode
LED 1	8	Lit when Breathalyzer is Ready	Flickering Fire
LED 2	10	Lit when few drinks on Breathalyzer and also for Good Weather and Good Stocks	Flickering Fire
LED 3	11	Lit when buzzed on Breathalyzer and also for OK Weather and OK Stock Performance	Flickering Fire
LED 2	12	Lit when flat out drunk on Breathalyzer and also for Bad Weather and Bad Stock Performance	Flickering Fire
Proximity LED	13	This LED will blink providing a visual indicator that the subject is within the proximity range defined by the configuration program. It will then turn solid when the Proximity Videos are playing and turn off when the Proximity Videos have stopped playing.	This LED will blink providing a visual indicator that the subject is within the proximity range defined by the configuration program. It will then turn solid when the Proximity Videos are playing and turn off when the Proximity Videos have stopped playing.

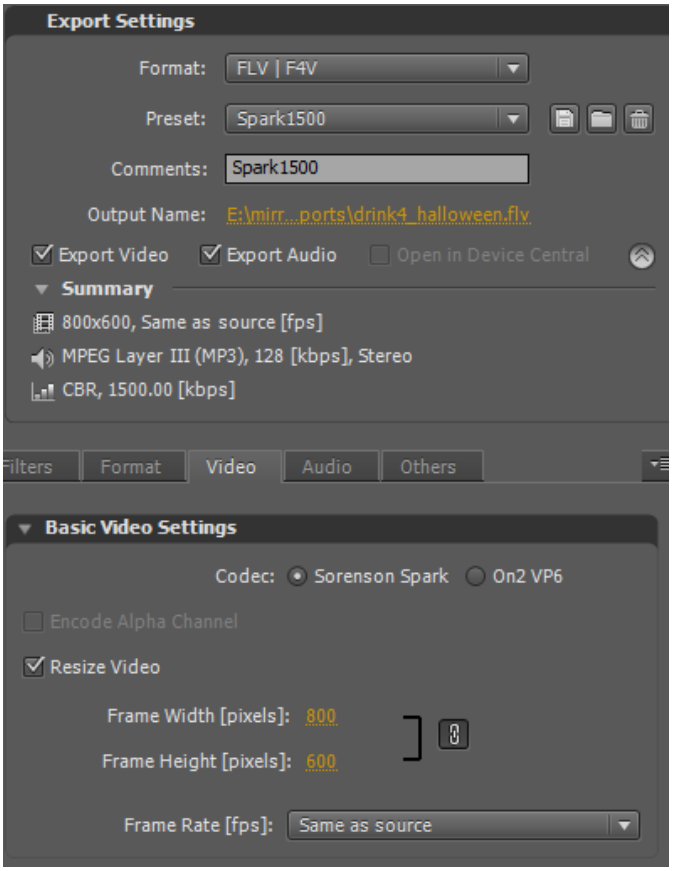
Customizing the Magic Mirror with your own Videos

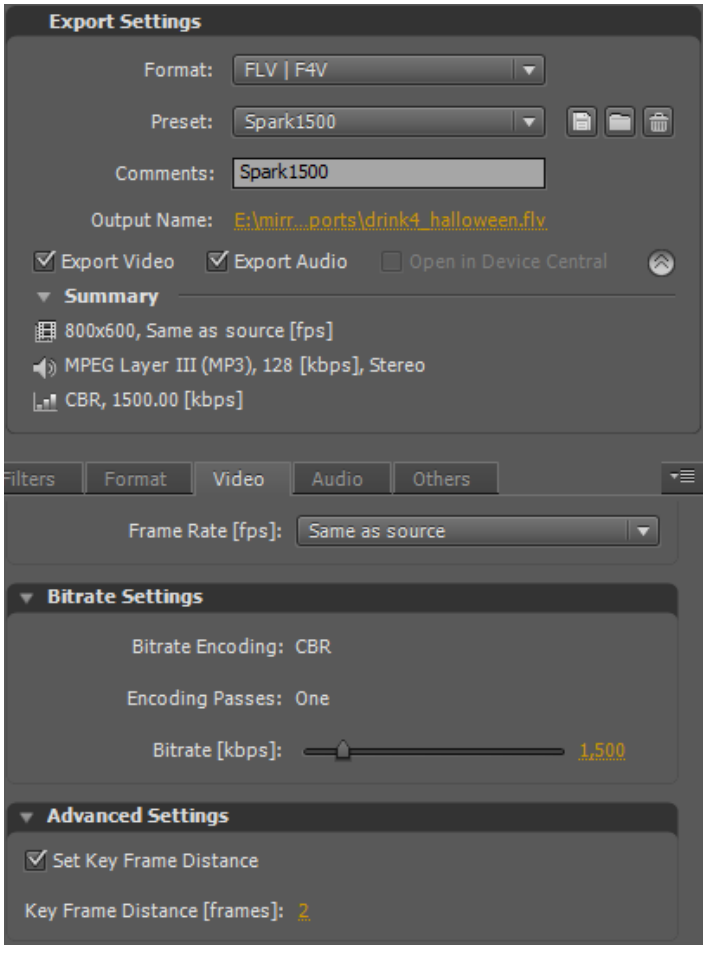
The DIY Magic Mirror was designed to allow the animations/videos to be personalized. To add your own videos:

1 You can use any video you like for the animations. If you'd like to add your own audio to the existing characters, purchase the character (each character is $15) you would like to personalize from http://www.imagineerieing.com/

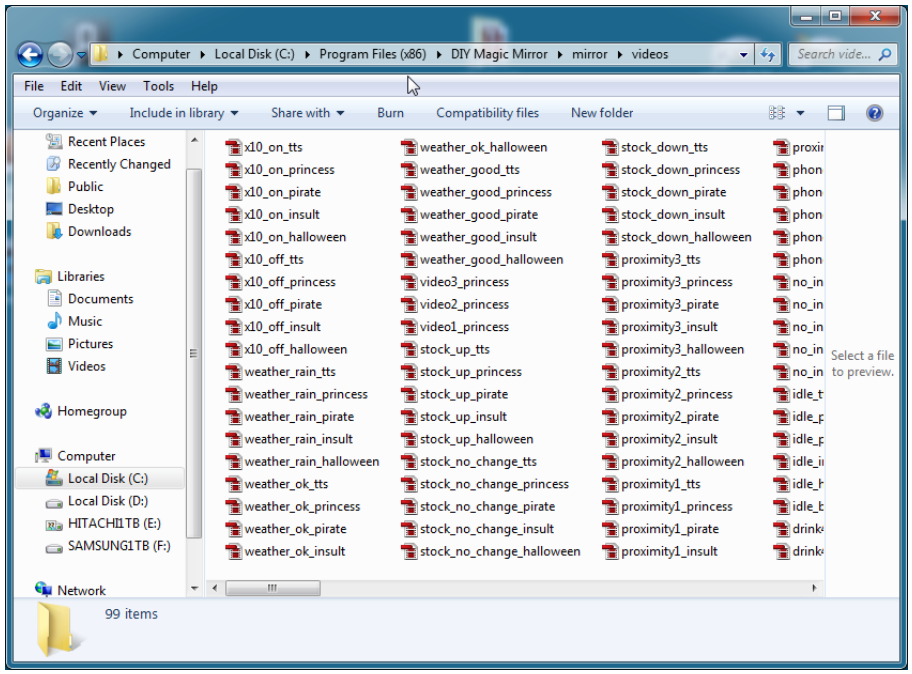
2 Record the audio separately. Then manually move the mouth movements of the digital puppet from imagineerieing using your keyboard to sync the audio. Use a video capture program (FRAPS works well for Windows users) to record the performance. Then assemble the audio and video together in your favorite video editing program. Rotate the character 90 degrees as per Pirate screen shot on the next page.

3 Encode the video in Adobe .FLV format using the settings below. Do not use the .F4V format.

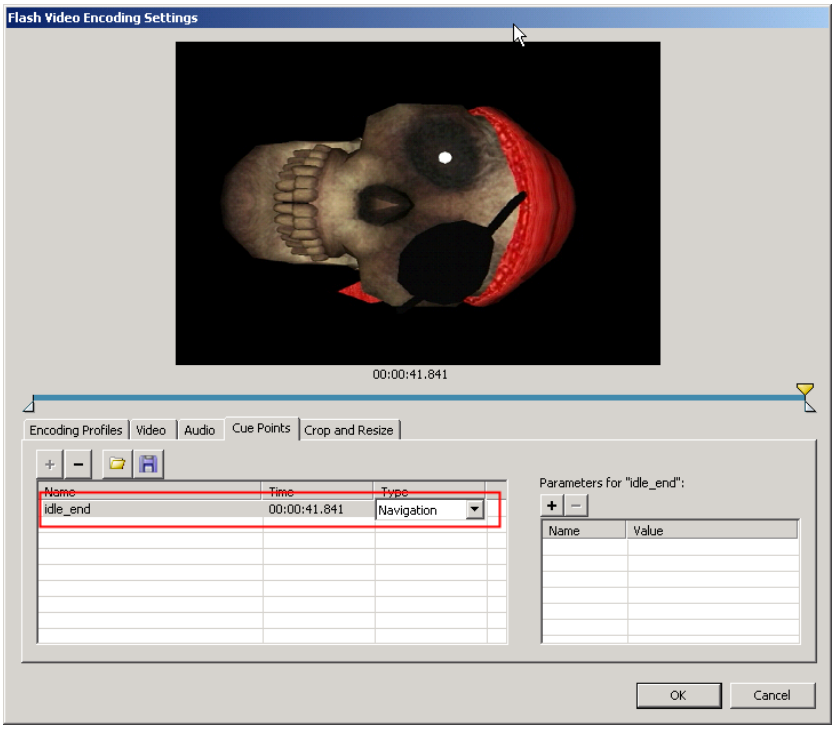




4 Overwrite the desired videos in “Install Directory\mirror\videos” with your own. See the “Sensor to Video Mapping” section for the function of each video file.



If you replace one of the idle videos (these are the ones that loop when the mirror is idle), you must also create a Navigation cue point (not Event type cue point) called “idle_end” towards the end of your idle video. If you don’t do this, your idle video will play just once and not loop. IMPORTANT: Create the navigation cue point at least 10 seconds before the end of the video.

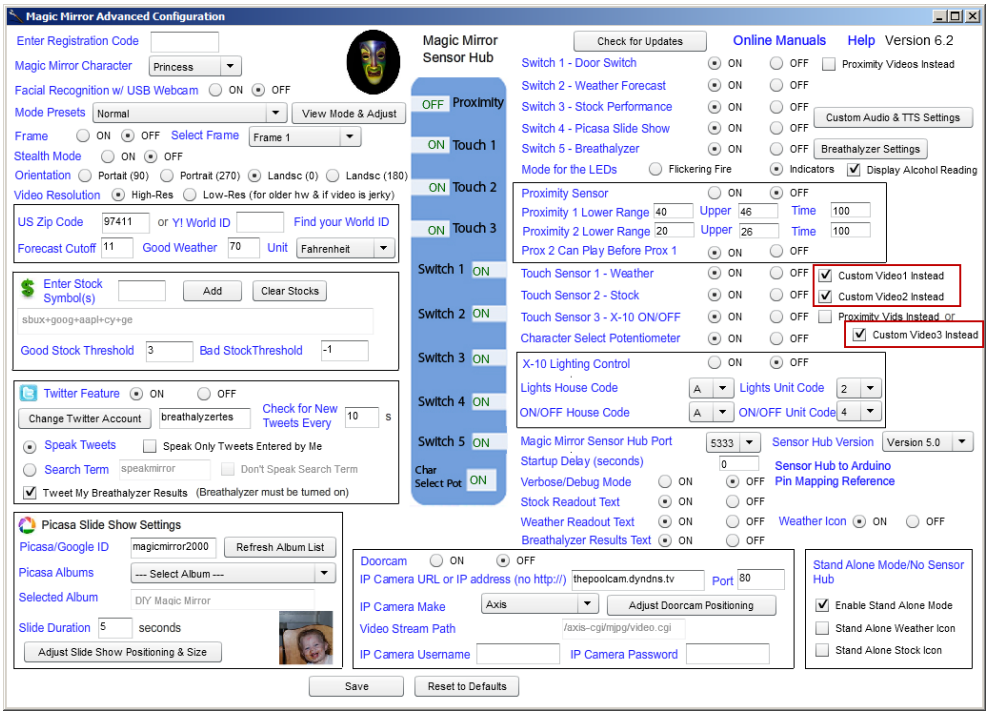


In addition, you may also change the touch sensor inputs to play custom videos you supply instead of the weather, stock, and x10 functions. Check the respective “Custom VideoX Instead” boxes in the Magic Mirror Advanced Configuration program to use this feature.

And then copy your custom .flv videos into “Install Directory\mirror\videos” following the naming convention below.

Mode	File Name
Princess	video1_princess.flv video2_princess.flv video3_princess.flv
Pirate	video1_pirate.flv video2_pirate.flv video3_pirate.flv
Halloween	video1_halloween.flv video2_halloween.flv video3_halloween.flv
Insult	video1_insult.flv video2_insult.flv video3_insult.flv
Custom Audio	video1_tts.flv video2_tts.flv video3_tts.flv

As an example, while in Princess Mode (selected by turning the character select knob/potentiometer) and Touch 1 is pressed, the “video1_princess.flv” video will play. While in Insult mode and Touch 3 is pressed, the “video3_insult.flv” video will play.



Sensors to Video Mapping (Videos must be in Adobe .FLV format)

For all videos except Touch Sensor 3 – X10/ON/OFF , switch 4 – Picasa slideshow, and the Breathalyzer videos, the lights will turn off when the video first begins to play and then turn back on when the video has completed if X-10 lighting control has been turned on.

Sensor	Triggered Video	Filename
Proximity	Proximity 1, Proximity 2, and Proximity 3 Videos	proximity1_princess.flv proximity2_princess.flv proximity3_princess.flv proximity1_halloween.flv proximity2_halloween.flv proximity3_halloween.flv proximity1_pirate.flv proximity2_pirate.flv proximity3_pirate.flv proximity1_insult.flv proximity2_insult.flv proximity3_insult.flv
Touch 1 - Weather	Plays one of three videos depending on the weather forecast	weather_good_princess.flv weather_ok_princess.flv weather_rain_princess.flv weather_good_halloween.flv weather_ok_halloween.flv weather_rain_halloween.flv weather_good_pirate.flv weather_ok_pirate.flv weather_rain_pirate.flv weather_good_insult.flv weather_ok_insult.flv weather_rain_insult.flv
Touch 2 - Stock	Plays one of three stock videos depending on your stock portfolio performance for the day	stock_up_princess.flv stock_no_change_princess.flv stock_down_princess.flv stock_up_halloween.flv stock_no_change_halloween.flv stock_down_halloween.flv stock_up_pirate.flv stock_no_change_pirate.flv stock_down_pirate.flv stock_up_insult.flv stock_no_change_insult.flv stock_down_insult.flv
Touch 3	X-10 Generic ON/OFF	x10_off_princess.flv x10_on_princess.flv x10_off_halloween.flv x10_on_halloween.flv x10_off_pirate.flv x10_on_pirate.flv x10_off_insult.flv x10_on_insult.flv
Switch 1	Door Video	doorbell_princess.flv doorbell_halloween.flv doorbell_pirate.flv doorbell_insult.flv
Switch 2	Weather	weather_good_princess.flv weather_ok_princess.flv weather_rain_princess.flv weather_good_halloween.flv weather_ok_halloween.flv weather_rain_halloween.flv weather_good_pirate.flv weather_ok_pirate.flv

		weather_rain_pirate.flv weather_good_insult.flv weather_ok_insult.flv weather_rain_insult.flv
Switch 3	Stock	stock_up_princess.flv stock_no_change_princess.flv stock_down_princess.flv stock_up_halloween.flv stock_no_change_halloween.flv stock_down_halloween.flv stock_up_pirate.flv stock_no_change_pirate.flv stock_down_pirate.flv stock_up_insult.flv stock_no_change_insult.flv stock_down_insult.flv
Switch 4	Picasa Slide Show	Picasa Slide Show
Switch 5	Breathalyzer	drink1_princess.flv drink2_princess.flv drink3_princess.flv drink4_princess.flv drink1_halloween.flv drink2_halloween.flv drink3_halloween.flv drink4_halloween.flv drink1_pirate.flv drink2_pirate.flv drink3_pirate.flv drink4_pirate.flv drink1_insult.flv drink2_insult.flv drink3_insult.flv drink4_insult.flv

Chapter 5

Hardware Installation Tips

Magic Mirror Installation Examples

Playhouse Installation

Halloween Party Running in stealth mode, the Magic Mirror appears as a normal bathroom mirror. Guests get a surprise when approaching the sink to wash their hands.	
Haunted House Prop The Magic Mirror at the bottom of a well.	 

Hotel Installation The Magic Mirror speaks the weather forecast to hotel guests.	
Maker Faire Exhibit	 

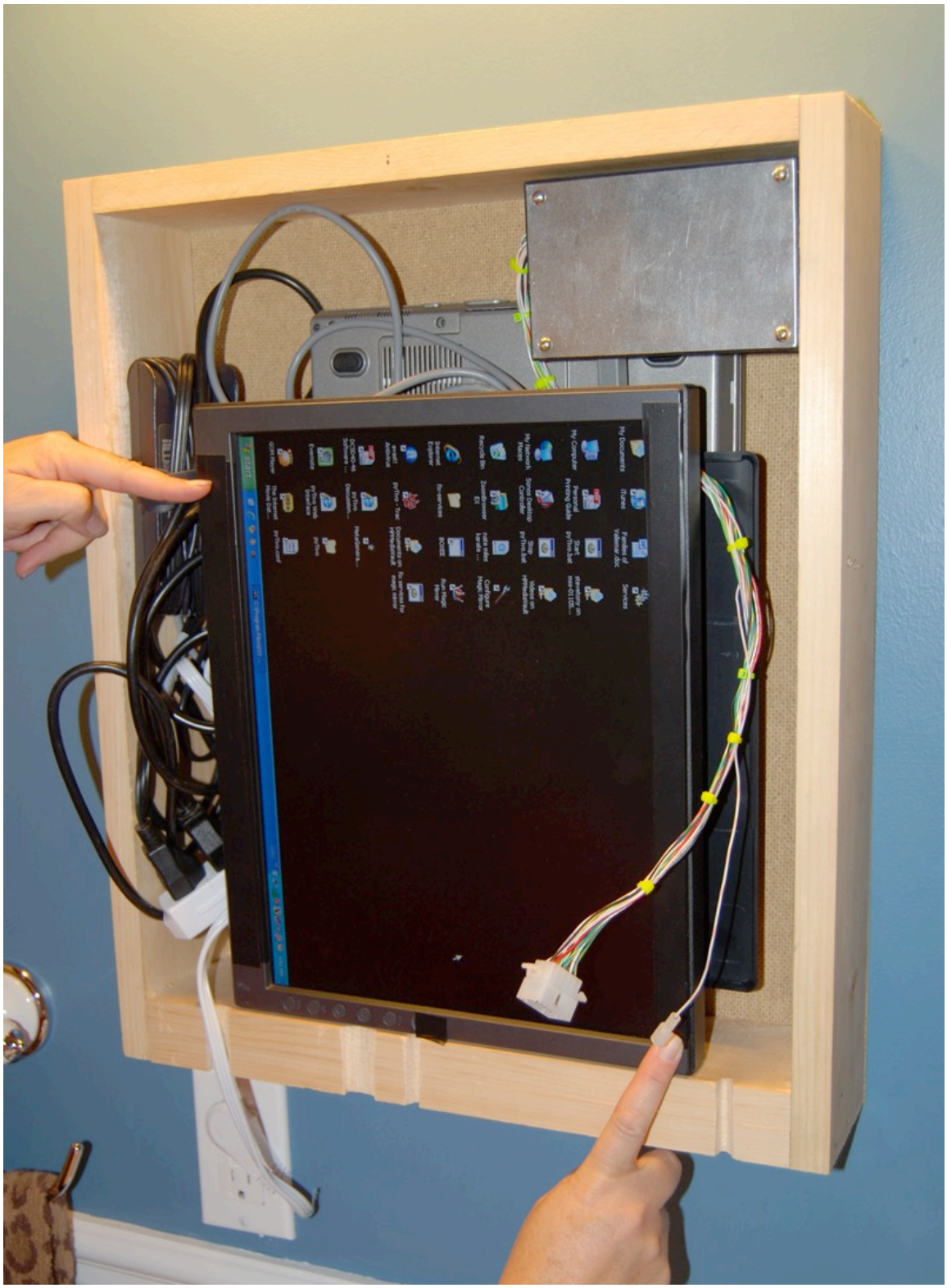
Breathalyzer Housing

1. Hot glue the Seeedstudio MQ-5 alcohol sensor to a 1 ½" ABS T-Pipe. Caution: Don't use anything smaller than 1 ½" and use ABS for this part, not PVC. The alcohol sensor works based on a chemical reaction and gets fairly hot. PVC emits a gas when heated which causes the alcohol sensor to give a false reading.	
2. Attach the PVC reducers to reduce the top opening from 1 ½" to ½" (1 ½ " to 1 reducer and 1 to ½" reducer).	
3. Hand out ½" PVC risers as mouth pieces for your guests.	
4. Connect your new Breathalyzer to the Magic Mirror Arduino Shield and blow into the mouth piece.	

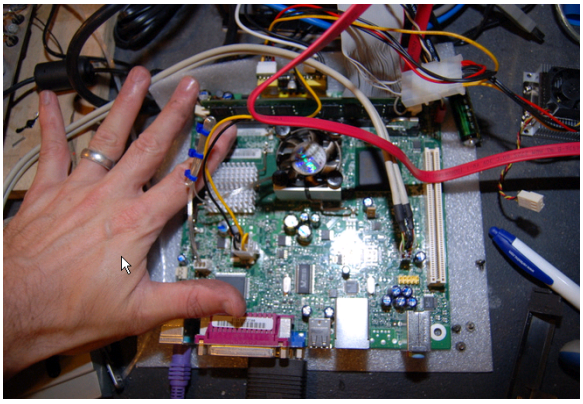
Recessing the Monitor With-in the Wall

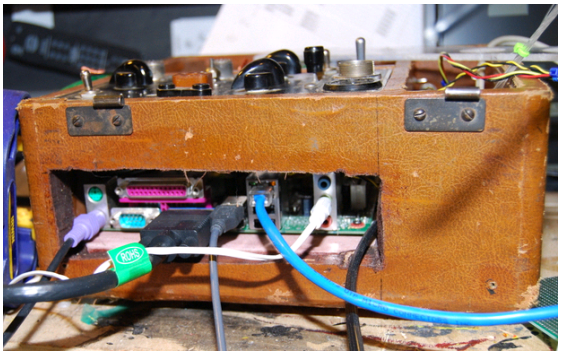
Frame out an opening per the picture frame dimensions. Be sure to leave some room within the monitor and wall for air circulation. Use a monitor that is VESA mount compatible, use a flush mount VESA mount to mount the monitor to the wall. Rotate the monitor 90 degrees and be sure to make which side is up. Drill necessary holes and route the monitor cable and power to the location of the Magic Mirror PC.

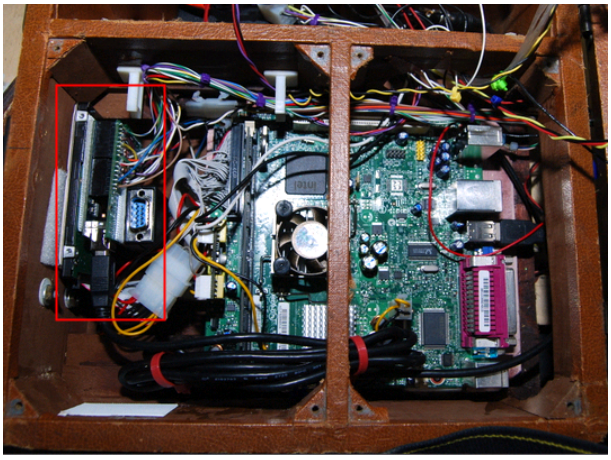
Build a Custom Box if In-Wall is not an Option



Mount the PC in an Old Case



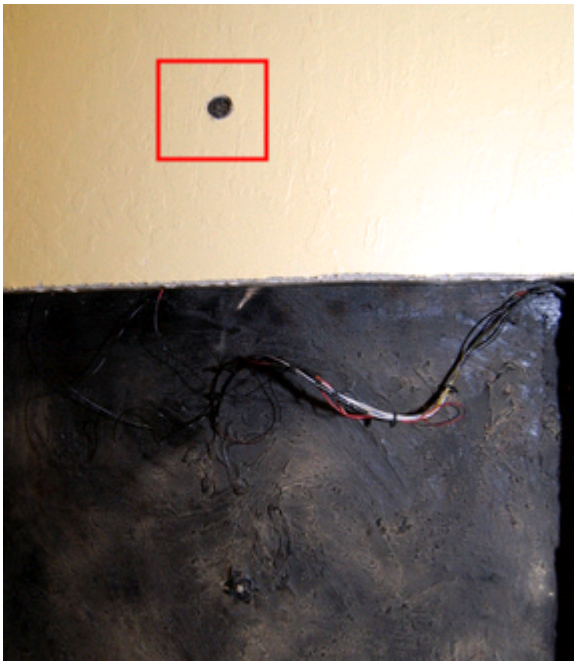


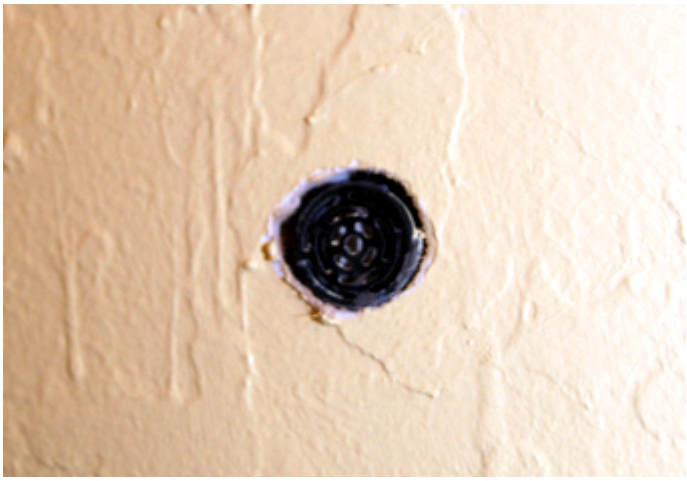


Mount the X-10 Firecracker and Arduino inside the PC case to save space

Recess the Proximity Sensor in the Drywall

Use RTV Silicone Adhesive or Epoxy to secure the proximity sensor to the back of the drywall.





For a Real Mirror Look, Use a Two-Way Mirror

http://www.mirropane.com is one supplier of two way mirrors.

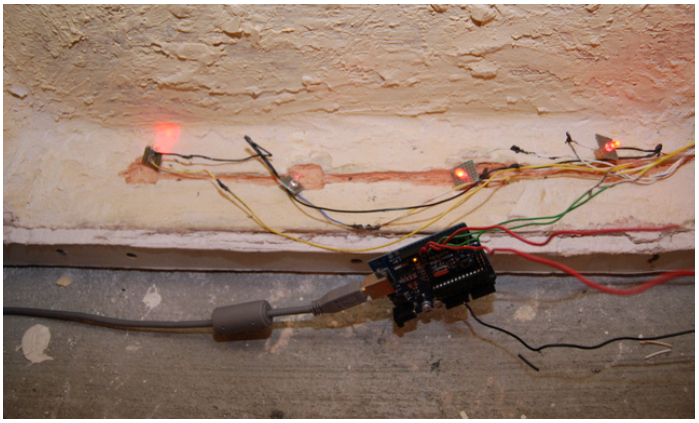
DIY Magic Mirror Off

DIY Magic Mirror On

Backside of the two-way mirror

Fake Fireplace

Build a fake fireplace below the DIY Magic Mirror. Per Appendix 1, the LEDs should be wired to Fire LED 1, 2, 3, and 4. They will all flicker at different intervals to simulate a fake fire.



Use drywall joint compound or wood puddy for the firebox texture and then black spray paint

Mounting the Touch Sensors in Drywall

Don’t forget to measure exactly the location of the sensor so you know where it is when the drywall is up. The Touch Sensor cable length can be extended up to 100 feet.

Cut hole in drywall, 1.5 inches x 1.5 inches

Cover hole with a thin piece of plastic/acrylic (less than 1/8” thick), glue touch sensor to plastic/acrylic piece

(do not use a metal drywall patch kit)

Cover with drywall fiberglass mesh

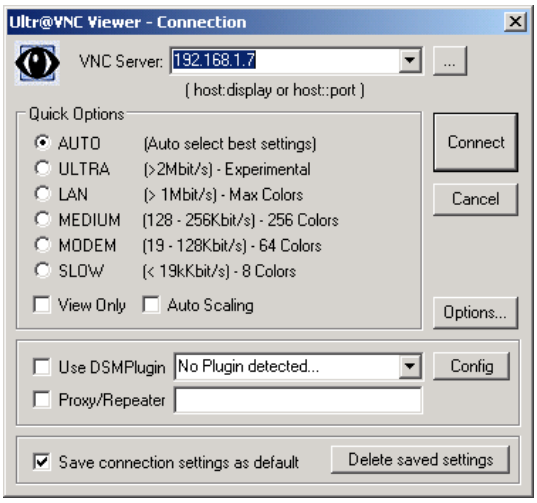
Cover with drywall joint compound

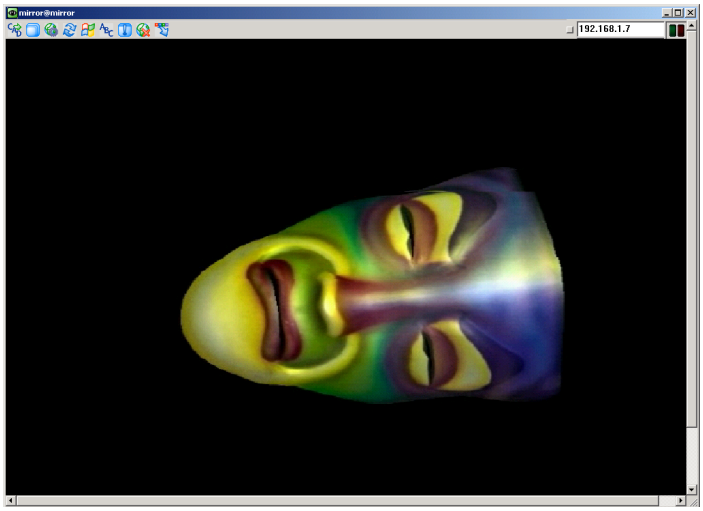
Sand with 150 grit sandpaper. Re-apply joint compound, sand again, and paint.

Add a sticker

Remote PC Maintenance

For remote maintenance to the magic mirror PC, VNC is free and works great. Tightvnc.com is one version. Note: VNC runs on Windows XP but not on Windows Vista. You'll need to install VNC server on the magic mirror PC and then the VNC client on the remote controlling PC. If using LINUX Ubuntu for the magic mirror PC, the VNC server is already installed by default.





Chapter 6

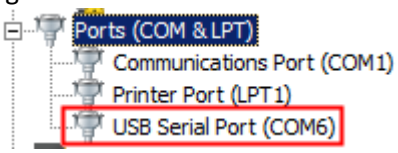
Troubleshooting

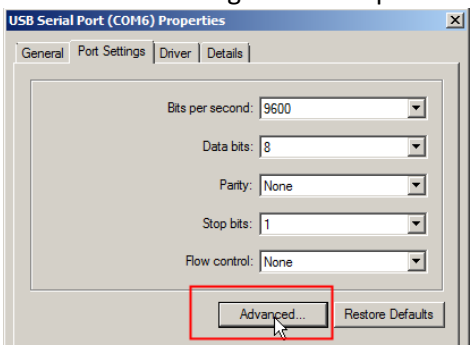
If you see this message when starting the Magic Mirror, this means the Sensor Hub/Arduino was not found.

The Magic Mirror did not initialize. Please check the following: 1. The Sensor Hub is plugged into your USB port 2. The Sensor Hub port number is set correctly in the configuration program 3. The serial proxy is running (serproxy on Windows & Mac, ser2net on Linux) 4. If you assembled your own Sensor Hub, ensure you did the one time upload of Firmata to the Arduino.

Please check the following:

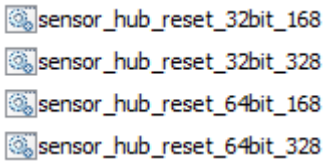
1. The Sensor Hub/Arduino is plugged into your USB port.
2. The OS driver has been installed for the Magic Mirror Sensor Hub/Arduino
3. If you built/assembled your own Sensor Hub, you did the one time upload of the Firmata firmware to the Arduino
4.You've entered the correct Magic Mirror Sensor Hub port in the configuration program
5. For Windows and Mac, serproxy is running (On windows, you have to instruct your firewall not to block). For Linux, ser2net is running.
6. On Windows, the COM port must be less than COM9. It will not work if it's set to COM10 or higher. If this is the case, right click on < USB Serial Port > and click the < Advanced > button to change the COM port.



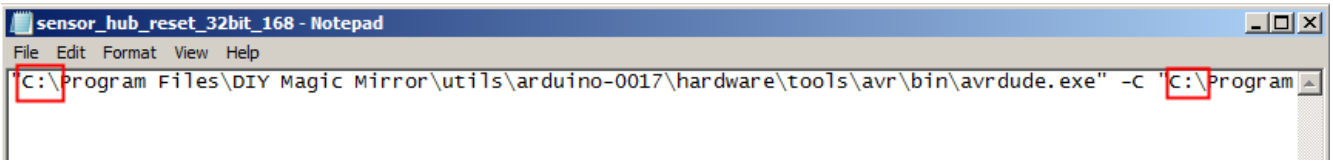


7. Restart and choose "Run Magic Mirror with Board Reset"

On Windows, if your installation directory is not on drive C, then you'll need to edit these four files to your installation drive. The four files are located in Program Files\DIY Magic Mirror.



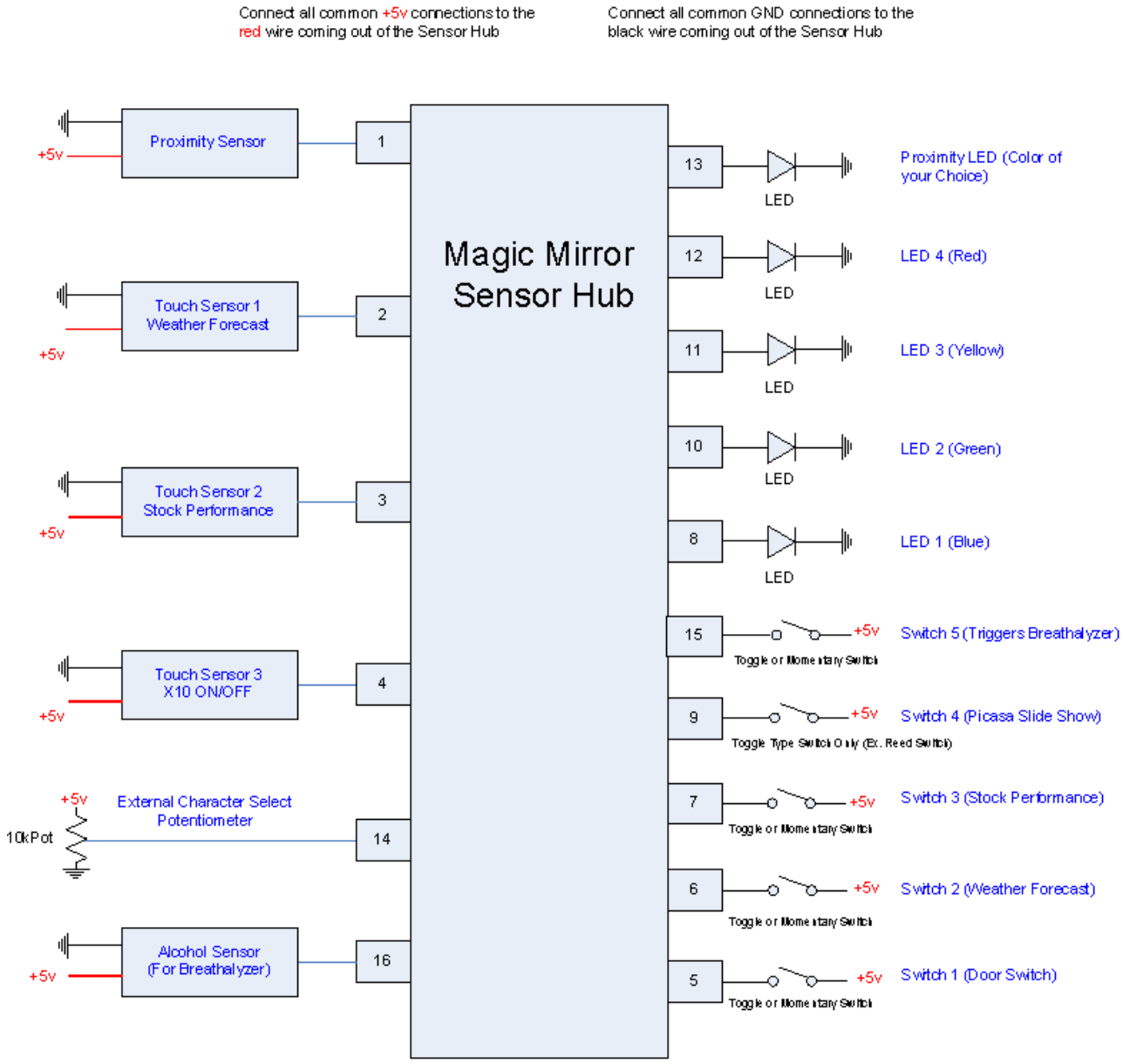
For example, if your installation drive is E:\Program Files\DIY Magic Mirror, then change C:\ to E:\ in each of the 4 files.



Problem	Solution
While in verbose mode, the proximity sensor is spitting out random distances	Your proximity sensor is not hooked up correctly. Check your wiring and also ensure the proximity sensor is getting power.
Weather, stock, door videos play randomly during normal operation when no sensor was triggered	You've got a sensor turned on in the configuration program that does not have a physical sensor hooked up to it. Run the configuration program and enable only inputs with physical sensors hooked up. Check your wiring if you have the configuration set correctly but still have the problem.
The Magic Mirror software is crashing	If you are not using the Touch Sensor/Analog inputs, ensure those are turned off from the Configuration program. If an analog input is left on with no sensor, the input will spit out random data overloading the Magic Mirror software causing it to crash.
The proximity videos are going off when no one is standing in front of the proximity sensor.	Either the proximity sensor is not getting +5V/not wired correctly or the distance returned from the proximity sensor when no one is in the room falls between the Proximity Lower Limit and Proximity Upper Limit settings. Start the Magic Mirror software in verbose mode and see what distance settings are returned with no one in front of the proximity sensor. Then run the configuration program and modify the Proximity Lower Limit and Proximity Upper Limit settings ensuring they are out of this range.
Everything else works but the the stock video does not play.	Most likely you have entered an invalid stock symbol. Start the configuration program and ensure all your stock symbols are valid.

Problem	Solution
The Magic Mirror is not turning off and on my X-10 lights.	First ensure you have X-10 turned on in the configuration program. Then ensure your X-10 Plug-in RF Base is plugged in and on the same AC circuit as your X-10 lamp module or switch. Ensure the X-10 address set on your X-10 module matches the X-10 address in the configuration program. You can hook up the Touch Sensors to the digital inputs (Switches 1-4) which will turn off and on the X-10 lights.
The Magic Mirror software is running fine, how do I stop and exit out?	The mouse cursor is hidden while the Magic Mirror software is running. On Windows, do an ALT-F4 to exit out of the Magic Mirror software.
Turning the mode select knob does not change the mode (Princess, Pirate, or Halloween).	Ensure that the Character Select Potentiometer is turned on in the configuration program. Also note the Character Select Potentiometer setting over-rides the software mode select setting from the configuration program. So simply turn the knob to the desired mode and the Magic Mirror will start in this mode every time.

Appendix A – Magic Mirror Sensor Hub Wiring Schematic



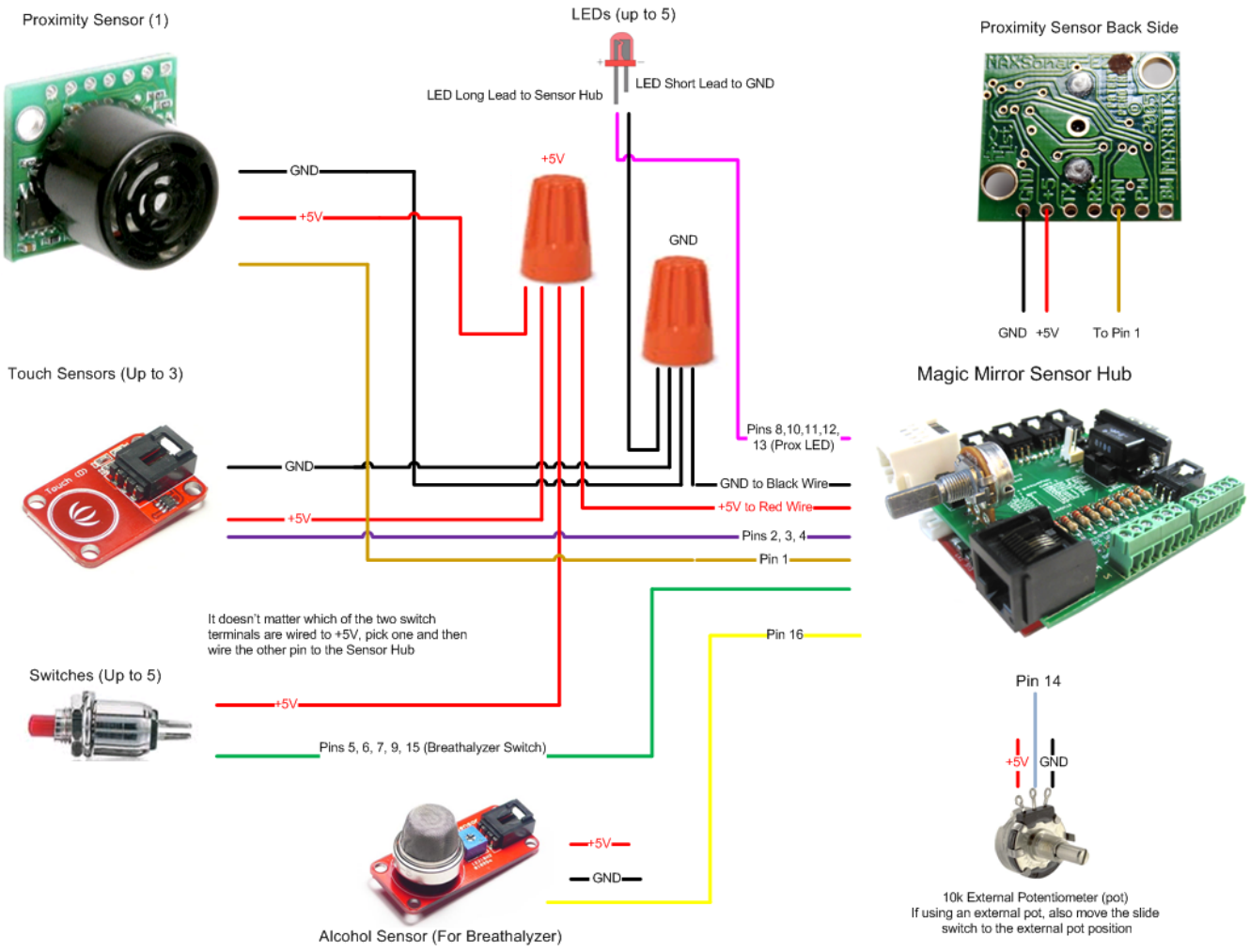
Pin	*Cat5e Cable1 (White)*
1 - Proximity	Cable 1 - White w/ Orange
2 - Touch 1	Cable 1 - Orange
3 - Touch 2	Cable 1 - White w/ Green
4 - Touch 3	Cable 1 - Blue
5 - Switch 1	Cable 1 - White w/ Blue
6 - Switch 2	Cable 1 - Green
7 - Switch 3	Cable 1 - White w/ Brown
8 - LED 1	Cable 1 - Brown

Pin	*Cat5e Cable 2 (Black)*
9 - Switch 4	Cable 2 - White w/ Orange
10 - LED 2	Cable 2 - Orange
11 - LED 3	Cable 2 - White w/ Green
12 - LED 4	Cable 2 - Blue
13 - Proximity LED	Cable 2 - White w/ Blue
14 - External Pot	Cable 2 - Green
15 - Switch 5 - Triggers Breathalyzer	Cable 2 - White w/ Brown
16 - Alcohol Sensor (For Breathalyzer)	Cable 2 - Brown

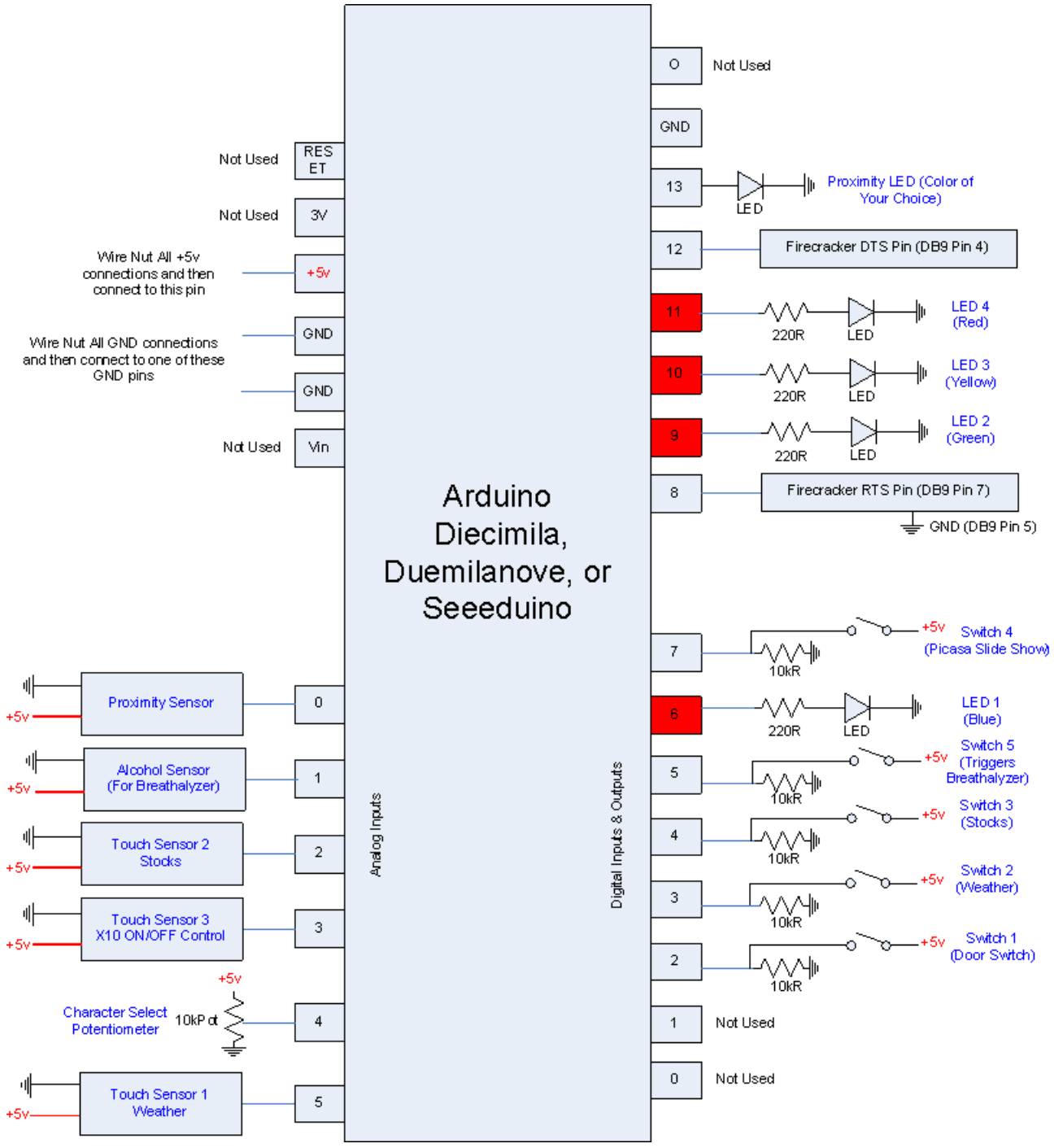
IMPORTANT: Cat5e cables must use the T-568B wiring color convention and not T-568A

Appendix B – Sensor Wiring Diagram Visual View

Note: The Magic Mirror shield is compatible with certain Grove sensors from Seeedstudio.com



Appendix C – Sensor Hub Internal Schematic



X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Educational Kits ***category:***

Click to view products by Seeed Studio ***manufacturer:***

Other Similar products are found below :

1805 4771 CS-SNEKBOARD-03 1116 1465 1834 1972 1999 2474 2798 DFR0089 DFR0107 FIT0004 FIT0045 FIT0046 FIT0415 KIT0019 KIT0020 SER0030 KIT-14501 3356 KIT0117 STEM-01 KIT-12963 KIT-14515 TOL-11784 KIT-10212 3417 3602 3850 419 572 801 1135 1148 1171 1842 1844 1968 2310 2668 3036 3093 3343 3791 3928 3957 4013 4103 4253