Project Chicken-Gate

# Description

This project describes an automatic gate for a hen-house. Its features are:

* Automatic open/close at daylight/nightfall
* Manual mode to disable daylight/nightfall mode
* Manual buttons for open/close
* A method to manually disable the gate actuator assembly

# Parts

## Linear actuator - Ordered

ECO-WORTHY 12 Volt 10 Inch Stroke Linear Actuator Heavy Duty 330lbs Maximum Lift with Mounting Brackets

<https://www.amazon.com/dp/B00NM8H5UA/ref=biss_dp_t_asn>

## Arduino motor shield - Ordered

(Must support 3Amp DC motors)

Cytron 10Amp 7V-30V DC Motor Driver Shield for Arduino

<https://www.cytron.io/p-10amp-7v-30v-dc-motor-driver-shield-for-arduino>

<https://www.amazon.com/Cytron-Motor-Driver-Shield-Arduino/dp/B07CW2ZQGP/ref=sr_1_3?keywords=Cytron+Motor+Driver+Shield+for+Arduino&qid=1557191523&s=industrial&sr=1-3-catcorr>

## Light Sensor - Ordered

Grove light sensor

<https://www.seeedstudio.com/Grove-Light-Sensor-v1-2.html>

## Open/Close buttons (2) – Ordered 1

Grove push buttons

<https://www.seeedstudio.com/Grove-Button-p-766.html>

## Grove Switch (For auto/manual) - Ordered

<https://www.seeedstudio.com/category/Grove-c-1003/category/Input-c-21/Grove-Switch-P.html>

<http://wiki.seeedstudio.com/Grove-Switch-P/>

## Electrical Enclosure – Ordered from Amazon

BUD Industries NBF-32018 Plastic ABS NEMA Economy Box with Solid Door, 11-51/64" Length x 7-55/64" Width x 6-9/32" Height, Light Gray Finish

Needs to accommodate

* Circuit boards
* Battery
* LCD display and switches on front panel (Plastic)
* Wall mount
* Hinged front door
* Weather proof

## Standoffs

* For circuit board assembly
* LCD display
* Buttons
* Switches

## 12 V DC Battery (Sealed lead acid, rechargeable)

<https://www.batteriesplus.com/battery/sla-sealed-lead-acid>

## Solar battery charger

For charging the 12V DC battery

<https://www.amazon.com/ECO-WORTHY-Waterproof-Battery-Trickle-Charger/dp/B018VPHOK4/ref=sr_1_3?gclid=EAIaIQobChMI_vXsiLaI4gIVhbxkCh3_kApdEAAYASAAEgKLZvD_BwE&hvadid=176951326556&hvdev=c&hvlocphy=9032142&hvnetw=g&hvpos=1t1&hvqmt=e&hvrand=13773267760986129701&hvtargid=aud-647846986441%3Akwd-4315436595&hydadcr=7802_9761239&keywords=12v+battery+solar+charger&qid=1557197971&s=gateway&sr=8-3>

# Component Diagram

Motor Controller

Light Sensor

Button bank

* Open
* Close
* Manual/Auto

Arduino controller

LCD Display

Door Open Switch ?

Door Closed Switch ?

Motorized gate assembly

12 V Solar panel

12 V DC battery

# Wiring Diagram

Motorized gate assembly (2 wire red/back DC)

LCD Display

LCD I2C Address 0X3E

RGB I2C Address 0X62

Motor Controller

PWM = Pin D3, DIR = Pin D4.

12 V Solar panel trickle charger

12 V DC battery

Reverse push button

D8 - Input

Forward push button

D7 - Input

Auto/Manual Switch

D7 - Input

Light Sensor

Connect to A0 (or any analog port)

Arduino controller – Power is through 12 VDC jack

Algorithm:

Loop:

Test Manual/Auto mode:

If changed:

Initialize Motor

Initialize LED Sensor

Initialize open button

Initialize close button

Update Manual/Auto Button

Else if Manual

Loop Manual

Else Loop Auto

Loop\_Manual

If Motor running:

Test Stop motor

If NOT open.pressed AND close.pressed

If open.pressed AND NOT motor.opening

Motor.open

If close.pressed AND NOT close.close

Motor.close

Loop\_Auto

If Motor running:

Test Stop motor

If NOT open.pressed AND close.pressed

If open.pressed AND NOT motor.opening

Motor.open

If close.pressed AND NOT motor.closing

Motor.close

If lightSensor.NewState NE lightSensor.OldState

If lightSensor.NewState EQ DAY AND NOT motor.opening

Motor.open

If lightSensor.NewState EQ NIGHT AND NOT motor.closing

Motor.close

Update light Sensor