Garage Door Controller

Build and

Installation Instructions

By: Jim Schrempp and Bob Glicksman; v1, 7/22/2020

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https://github.com/TeamPracticalProjects/Garage\_Door\_Controller/blob/master/Terms\_of\_Use\_License\_and\_Disclaimer.pdf

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# OVERVIEW.

This document provides step-by-step instructions for assembling and installing a Garage Door Controller. Before proceeding with this project, you must read and accept the “*Terms\_of\_Use\_License\_and\_Disclaimer*” document which is located in the root level of this repository.

The following parts are needed to build this project:

* Wireless I/O Board with components needed for the project. See section 2 of this document for details.
* Garage Door Opener Remote Control Unit. Our garage door opener uses remote control unit “Liftmaster 371LM”, available at: <https://smile.amazon.com/gp/product/B075MQCH2P/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&psc=1>. Your garage door opener may require a different remote control unit. The remote control unit needs to be modified and mounted in the project enclosure. See sections 3 and 4 of this document for details.
* Ultrasonic Distance Sensor, SR-HC04. These are very commonly found, for example: <https://smile.amazon.com/ELEGOO-HC-SR04-Ultrasonic-Distance-MEGA2560/dp/B01COSN7O6/ref=pd_bxgy_3/137-6812788-8746123?_encoding=UTF8&pd_rd_i=B01COSN7O6&pd_rd_r=cd21824f-1050-44c8-8e2f-b261e16cf05a&pd_rd_w=oLoDZ&pd_rd_wg=nKuOW&pf_rd_p=ce6c479b-ef53-49a6-845b-bbbf35c28dd3&pf_rd_r=F9BXN7BAX9TP8ED9SY81&psc=1&refRID=F9BXN7BAX9TP8ED9SY81>
* Mounting bracket for HC-SR04 sensor. If your sensor did not come with a suitable mounting bracket, you can purchase these: <https://smile.amazon.com/HC-SR04-Cartoon-Ultrasonic-Distance-Mounting/dp/B01FDGU0GY/ref=sxts_sxwds-bia-wc-nc-drs1_0?crid=1HS1W1659L4XW&cv_ct_cx=hc-sr04&dchild=1&keywords=hc-sr04&pd_rd_i=B01FDGU0GY&pd_rd_r=d8101316-87b4-4755-9f9f-a978dcfc9433&pd_rd_w=zuloG&pd_rd_wg=ulQPE&pf_rd_p=43f4b3f0-0b04-46ba-8a08-2e851d035e17&pf_rd_r=2DJESSE197W2F6GX3W0G&psc=1&qid=1595356387&sprefix=HC-SR04%2Caps%2C215&sr=1-1-f3947b35-9c59-4d7a-9603-b751e6eed25b>
* USB “Wall Wart” Power supply. A 5 volt, 1 amp (min) power supply. For example: <https://www.adafruit.com/product/501>
* USB A/B Cable. The length will depend upon where the project is mounted with respect to the nearest convenient AC power source. Here is a 10 foot cable that we used: <https://smile.amazon.com/gp/product/B00NH13DV2/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&psc=1>
* Project enclosure. We used the following “pencil box”: <https://smile.amazon.com/Really-Useful-Plastic-Storage-Liter/dp/B003H790JU/ref=sr_1_2?dchild=1&keywords=really+useful+boxes+pencil+box&qid=1595357131&sr=8-2>
* Female-Female Jumper Cables. If these didn’t come with the HC-SR04 ultrasonic sensors, you can purchase these: <https://smile.amazon.com/Really-Useful-Plastic-Storage-Liter/dp/B003H790JU/ref=sr_1_2?dchild=1&keywords=really+useful+boxes+pencil+box&qid=1595357131&sr=8-2>
* Mounting Hardware.
  + 2 ea. ½ inch 4-40 nylon standoffs, female-female, threaded.
  + 4 ea. ¼ inch 4-40 nylon screws.
  + 4 ea. ½ inch 4-40 nylon screws.
  + 6 ea. 1 inch, #6 wood screw.

The following tools and materials are needed to build this project. Make sure that you know how to use these before undertaking this project!

* Small tip soldering iron.
* Electrical solder.
* A few feet of #26 solid, insulated wire. It will be helpful to use three different colors – red, black, any other color.
* Wire stripper.
* Diagonal wire cutter.
* Needle nose pliers.
* Various screwdrivers.
* Electric drill, ¼” or larger, with a set of bits 1/32” to ¼” minumin
* Electrical tape.
* Hot glue gun with glue sticks.
* Nibbling tool (optional)
* Set of small files (optional).

Our recommended order of assembly is as follows.

* Assemble a Wireless I/O Board with the necessary components for this project – see section 2 of this document.
* Modify the remote control unit for use in this project – see section 3 of this document.
* Drill mounting holes in the remote control unit enclosure – see section 4 of this document.
* Drill/cut the project enclosure and HC-SR-4 mounting bracket – see section 4 of this document.
* Assemble parts in project enclosure bracket – see section 4 of this document.
* Wire up all parts of the project bracket – see section 4 of this document.
* Install Photon firmware and test that the parts work – see section 5 of this document.
* Mount the project in its final location – see section 4 of this document.
* Install the App on your smartphone – see section 6 of this document.

# WIRELESS I/O BOARD ASSEMBLY INSTRUCTIONS.

# GARAGE DOOR REMOTE MODIFICATION INSTRUCTIONS.

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A circuit board

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# ENCLOSURE FABRICATION AND INSTALLATION INSTRUCTIONS.

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A close up of electronics

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A picture containing wooden, indoor, table, sitting

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# FIRMWARE INSTALLATION AND TESTING INSTRUCTIONS.

# ANDROID APP INSTALLATION INSTRUCTIONS.