
Building a Car2U Wired Bridge for Security+ 2.0 Garage Door Openers

The Issue:

New Security+ 2.0 door & gate operators are not compatible with either Lear Car2U or older Gentex HomeLink remote opener systems built into many vehicles.

NOTE: HomeLink and Car2U use different protocols. This document focuses on the Car2U system. Results for bridging HomeLink to Security+ 2.0 operator systems are unknown.

Potential Solutions:

1. Install a Chamberlain Car2U wireless bridge.

Upside: Plug-and-Play, so quick and easy installation

Downside: Product discontinued by Chamberlain, reports of poor performance and potential loss of MyQ functionality

2. Fabricate and install a wired bridge device from current LiftMaster parts.

Upside: More reliable, better range, and can be programmed to work with any of the older systems that uses the 390MHz frequency band.

Downside: Electronics soldering skills required, modification of bridge components voids their warranty

The cost for either solution is currently around \$100. The instructions below detail the fabrication of solution # 2.

Parts List:

- LiftMaster 412HM 390MHz Universal Receiver (a 315 MHz Liftmaster Universal Receiver is available for systems that use that frequency)
- Suitable 12VDC power supply having a plug compatible with the receptacle on the 412HM. (I am using an old Microsoft 12V 2A power supply that works fine.)
- LiftMaster 883LMW Pushbutton Door Control

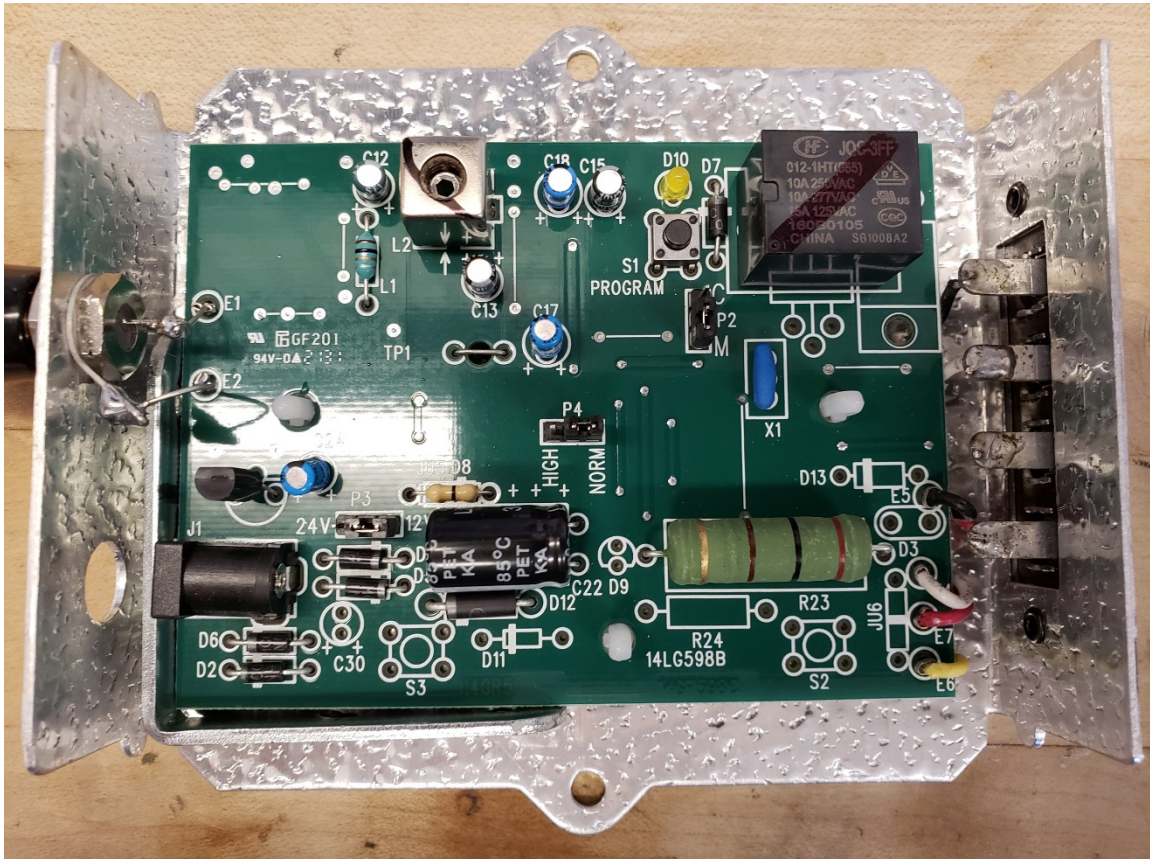
Tool List:

- Solder and soldering tools (pencil, SMD fine tip, standard tip)
- Side-cutters, wire strippers, crimpers, and various other hand tools
- Multimeter

- Hot glue gun
- Optional: Digital inspection microscope

The Procedure:

1. Obtain all necessary parts.
2. Set the jumpers on the circuit board of the 412HM as follows (The cover just pries off):
 - Set P2 to the “M” position (this is factory default)
 - Set P3 to the “12V” position (this is NOT default)
 - Set P4 to the “NORM” position (this is NOT default)



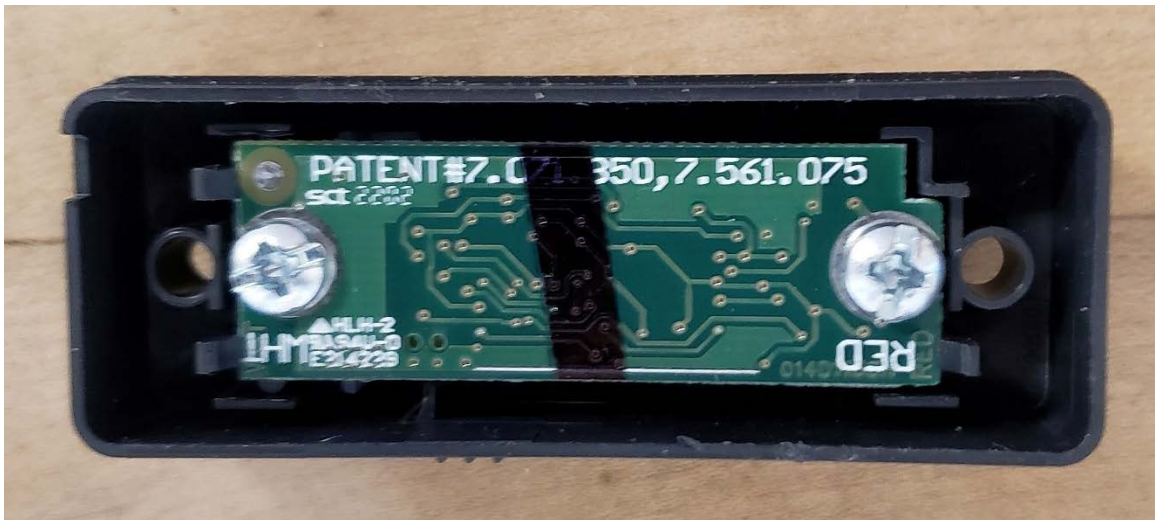
3. Connect the 412HM to your 12VDC power supply and plug that into 120VAC power. Pair your Car2U remote buttons(s) and/or the buttons on the remotes from your previous door operator with the 412HM. Pairing instructions are provided in the box with the unit. The photo above is of the circuit board inside the 412HM. An audible click from the relay (upper right corner of board above) when pressing a remote button paired with the 412HM confirms pairing success.

If the new Security+ 2.0 system had used a simple contact closure circuit for wall controls, you could just connect terminals 3 and 4 to the correct terminals on the operator unit, and you'd be finished, BUT IT DOESN'T! In order to support all of the enhanced functionality, this system employs digital pulse codes to transmit commands. This is why we also need the 883LMC (shown at the right),



which contains a little board with circuitry to convert your button press into the correct digital pulse code for toggling your door's Open/Close operation.

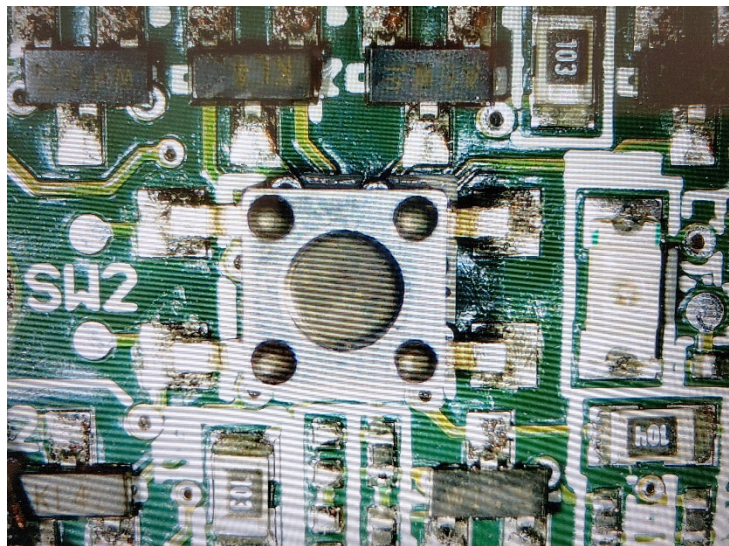
Note the ring terminals on the circuit board beneath the screws. You will need to solder Output leads to these ring terminals



4. Completely remove the screws, and pry the circuit board out of the button housing. The component side of the circuit board is shown in the photo below

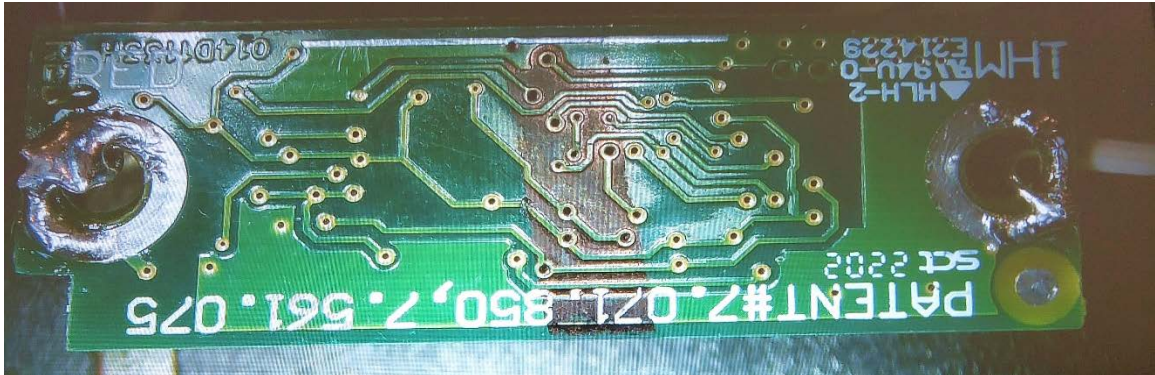


At the right is an extreme closeup of the circuit's surface-mount Open/Close button and its mounting pads. You will later be soldering a pair of input wires from the 412HM's contact closure outputs to two of these pads. More details further on.

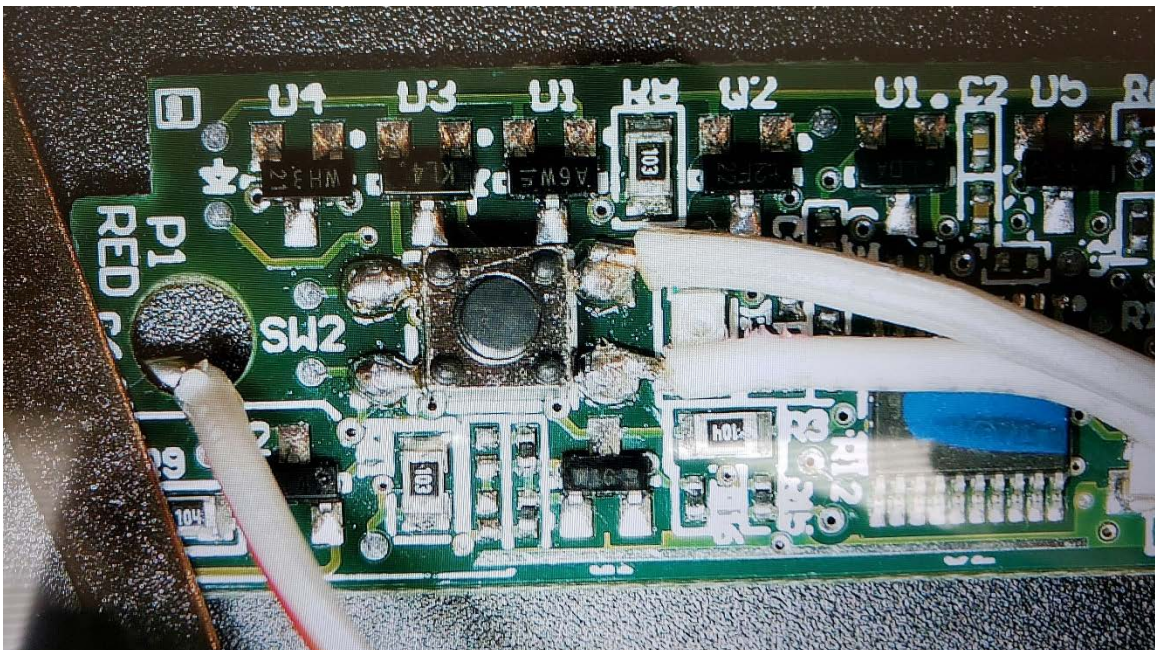


NOTE: Soldering to any SMD is delicate work. Too much heat can destroy these parts, so ensure that you use a very fine SMD soldering tip on your soldering pencil when connecting the leads. I set the temperature on my soldering station to 620F degrees. This provided good results. Performing this work under an inspection microscope, if you happen to have one, will also help make this work somewhat less tedious.

5. You will later mount this circuit board onto a suitable riser that you'll add to the circuit board in the 412HM, so solder a 10" pair of leads onto the ring terminals such that they exit through the holes, as shown below, so the bottom remains fairly flat. Note that polarity must be maintained for these output leads. You need to maintain polarity all the way to the operator unit, so use two different color wires. and remember which color is soldered to which terminal (RED vs. WHT).



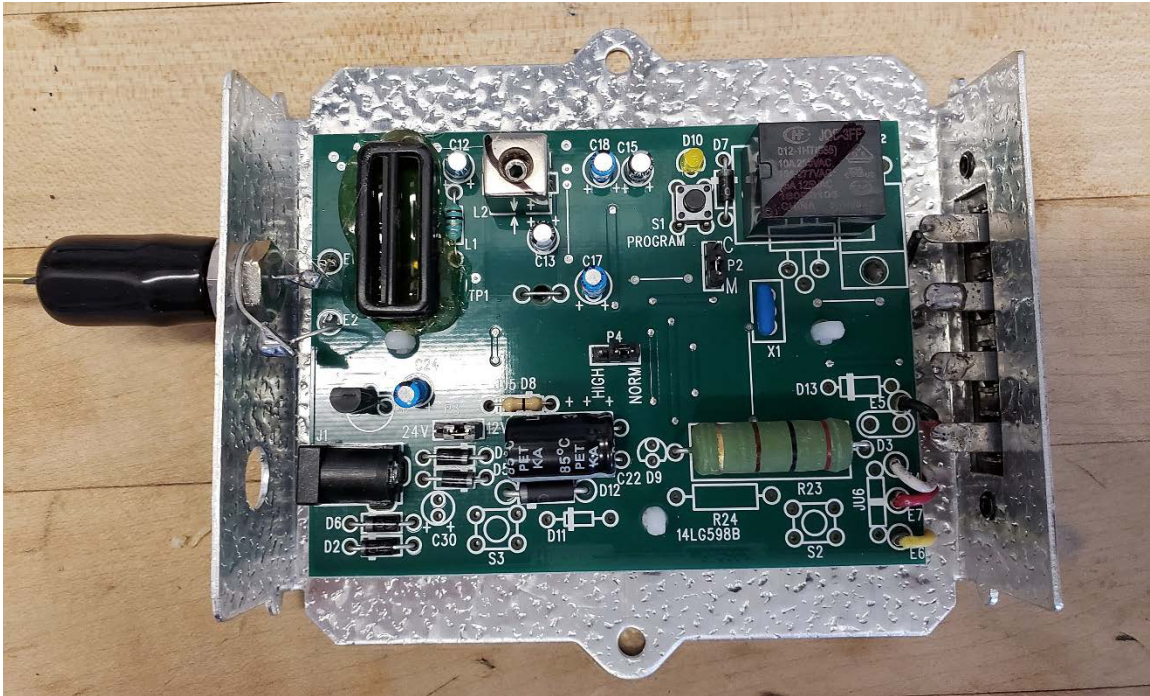
6. Solder a 10" pair of input leads to the circuit board's pushbutton pads, as shown below. This input circuit is a simple relay contact closure to translate a mechanical press of the button into an electrical voltage to the ADC circuitry, so it isn't necessary to maintain polarity end to end.



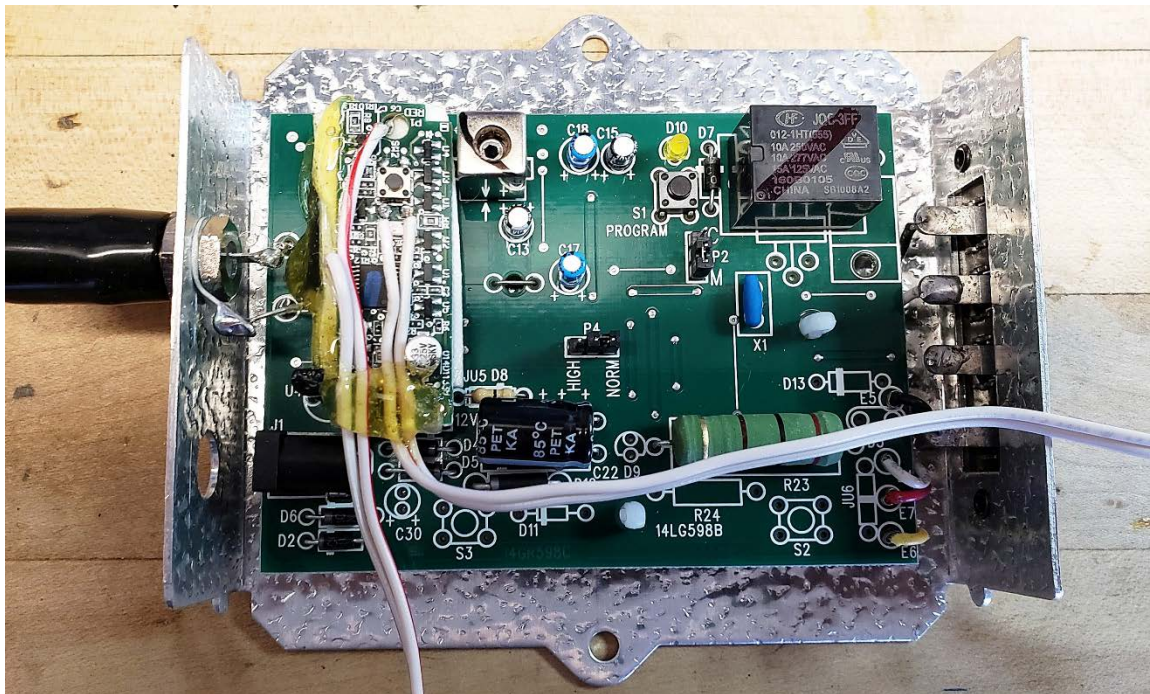
NOTE: I noticed that there wasn't enough solder on the button pads when I inspected the photo above, so I resoldered them.

7. Using a hot glue gun or other suitable method, secure a non-conductive riser to the available space near the antenna leads on the 412HM's circuit board, as shown

below. Ensure that the riser is short enough to support replacement of the 412HM's cover with the new daughter card in place.

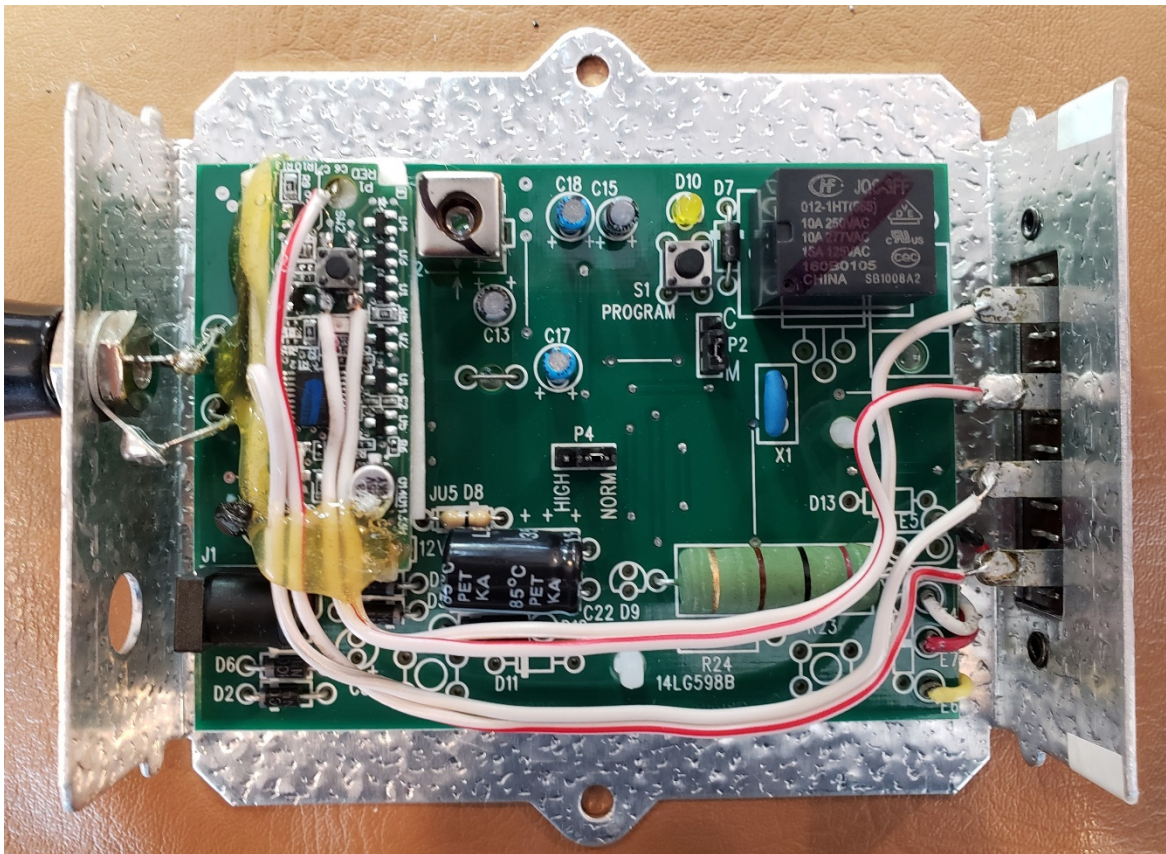


8. Secure the daughter card to the riser. I used double-sided mounting tape to secure mine, and then followed up with a liberal application of hot glue on both the card and the I/O leads, as shown in the photo below.



9. Snip and remove the internal wiring to terminals # 1 and # 2 on the 412HM. (In the unit's factory configuration, these terminals are available for supplying 24V from an external source, but you will be connecting them to the digital pulse code output signal from the new daughter card.) After removing the factory connections to terminals 1 and 2, internally solder the daughter car's output leads to them. Then, internally solder the input leads to the daughter card (soldered to the button pads) to terminals 3 and 4, but leave the internal factory connections intact, so you can use them as test points to confirm the operation of the relay inside the 412HM.

Prior to landing the I/O wires on the screw terminals, trim them to a suitable length, but not too short, because soldering new leads to the daughter card at this point would entail a lot of pain and suffering. Your 412HM's internals should look similar to the photo below after you've finished the I/O connections.



10. Re-label the screw terminals on the 412HM to indicate their new assignments. I used a Dymo labeler, but permanent marker would work fine. I also added a descriptive tag to the cover to alert service people that this unit is not stock. These additions are shown in the photos below



11. Plug your 12VDC power supply into both the wall and the 412HM, and connect a pair of leads from terminals 1 and 2 of the 412HM to the wired door control terminals on the overhead door operator unit. Then, confirm that the door operates with your Car2U and/or other older remote controls that you paired with the unit.
12. Finally, mount and dress out your new equipment. I mounted mine to the support structure above the overhead door operator, as shown below.



GOOD LUCK! We're all counting on you.