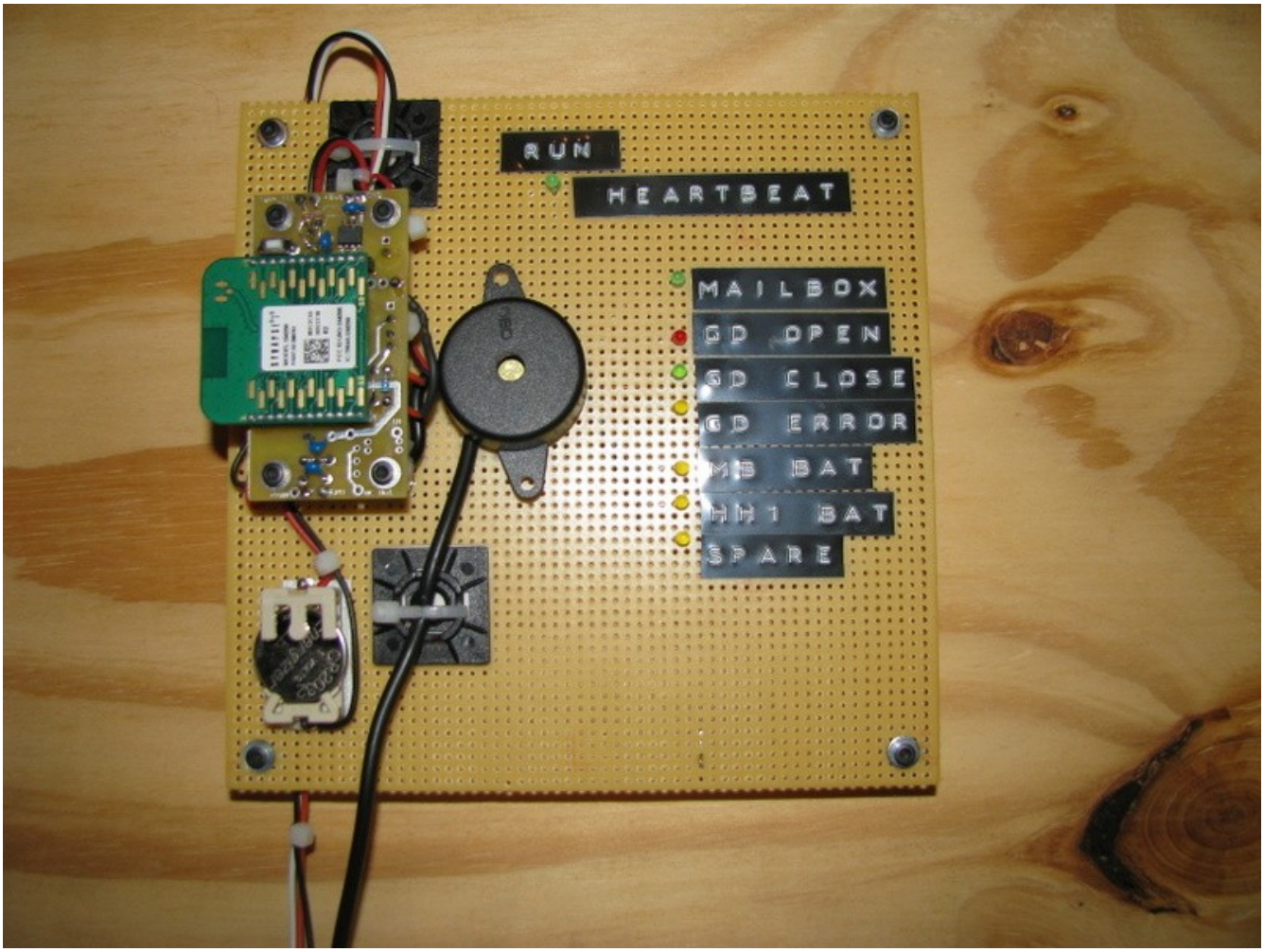
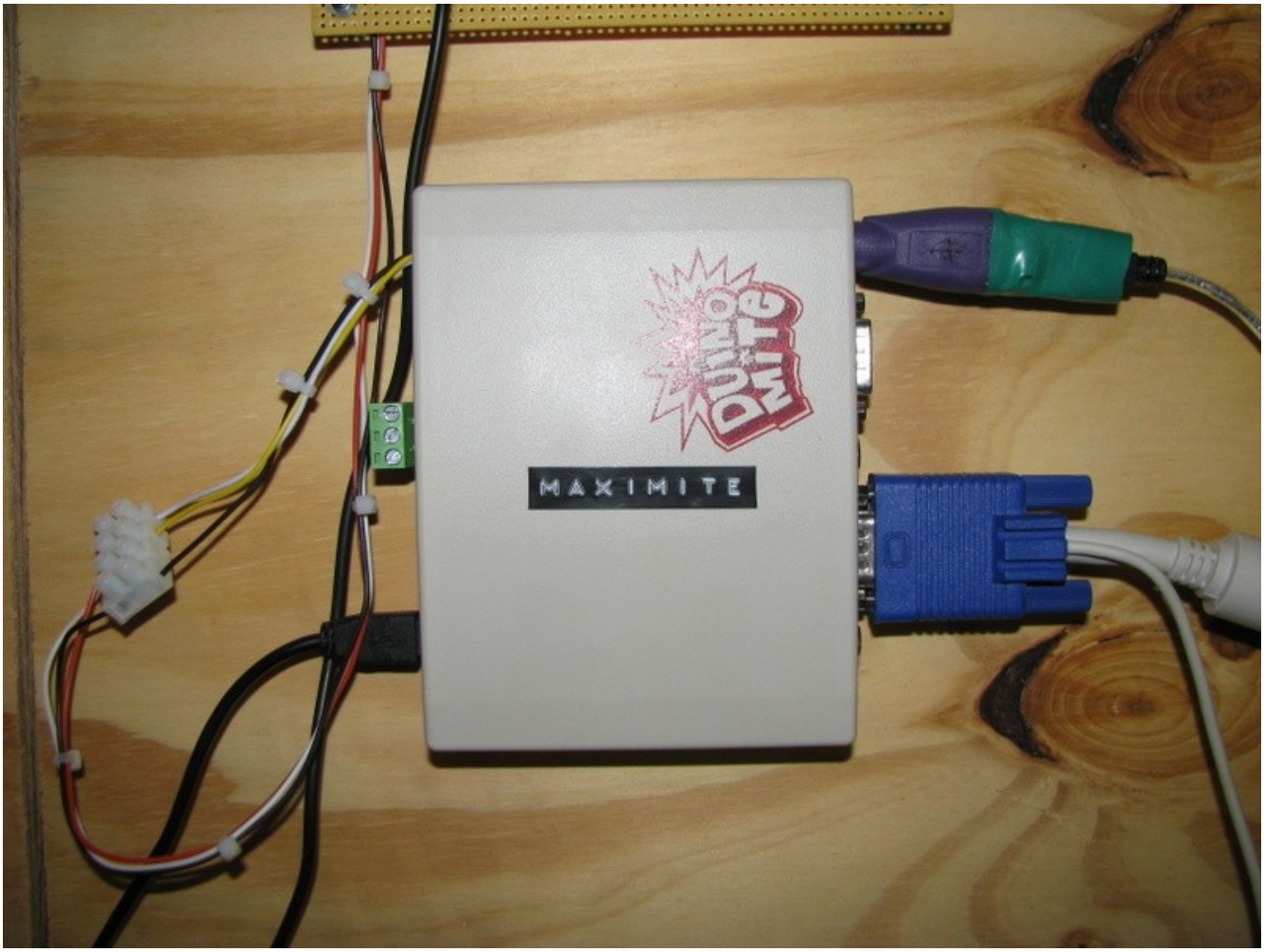
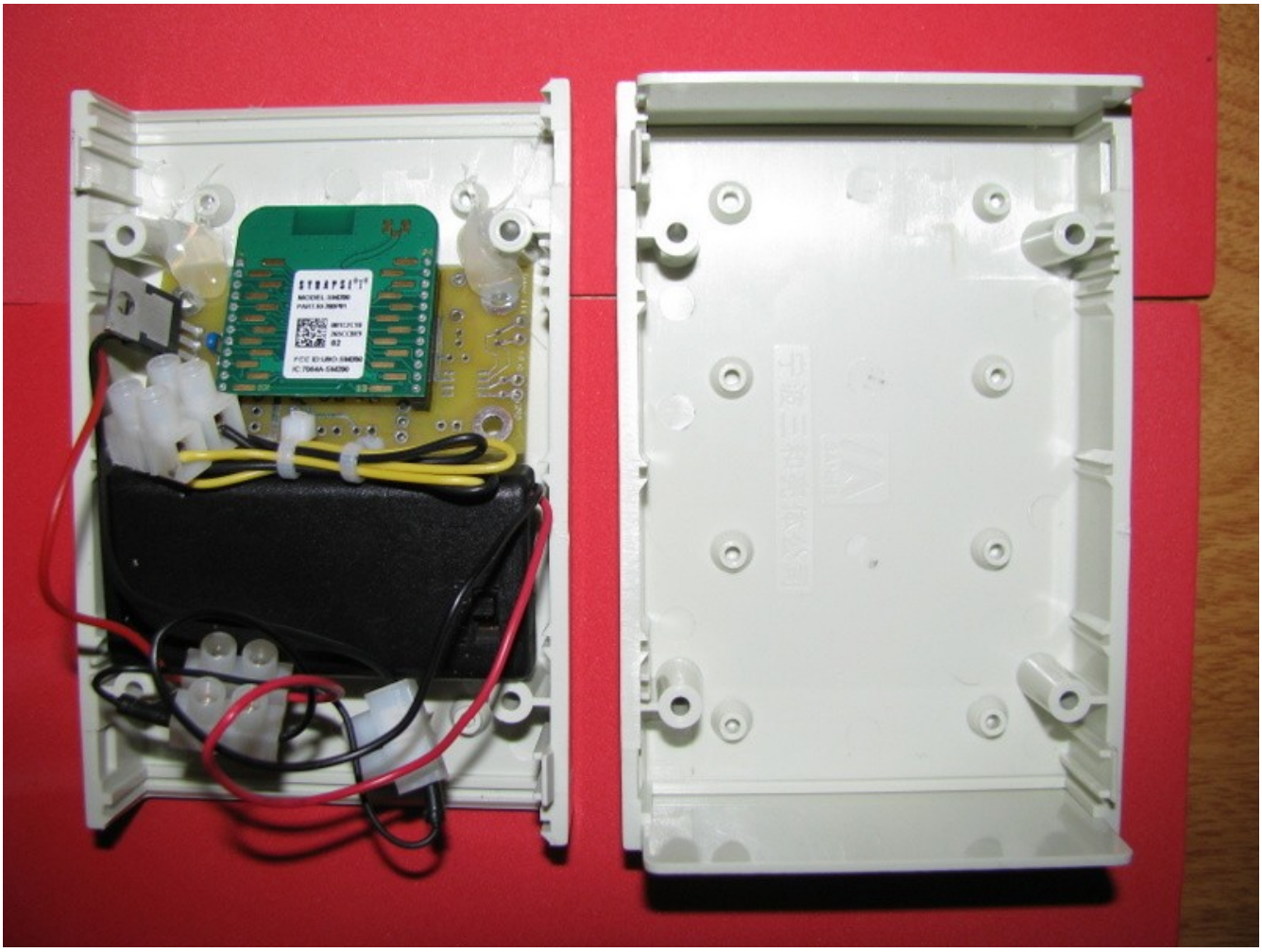


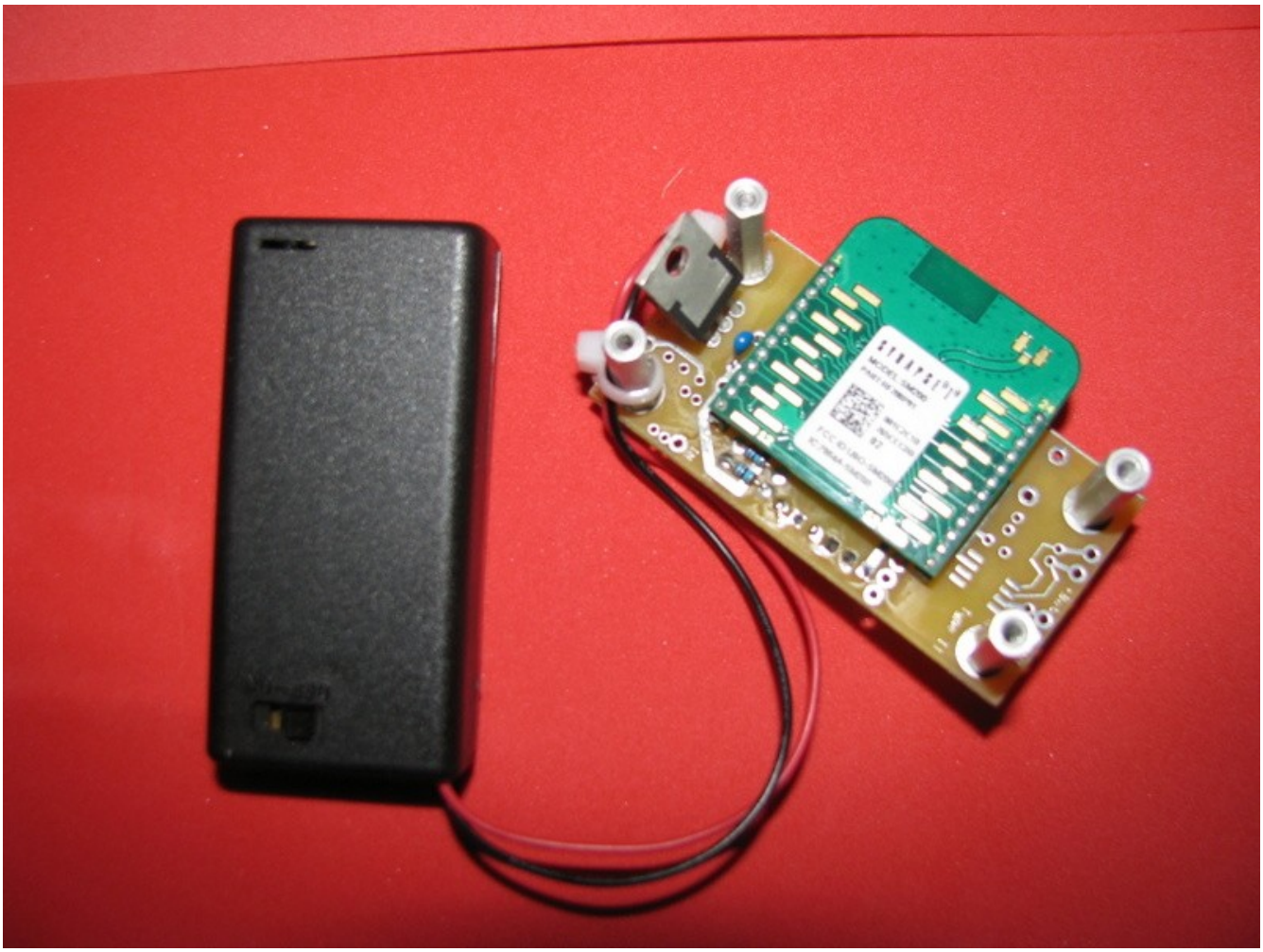
This Synapse RF node (Mesh central) is used to show the digital status of the other nodes and also serially communicates to the MaxiMite Basic computer for VGA video messages and for SD logging. I have included a precision RTC (DS3231M+) for scheduling periodic tasks in this Synapse RF node. The beeper beeps when the garage door opens/closes or when the mail is delivered or picked-up.



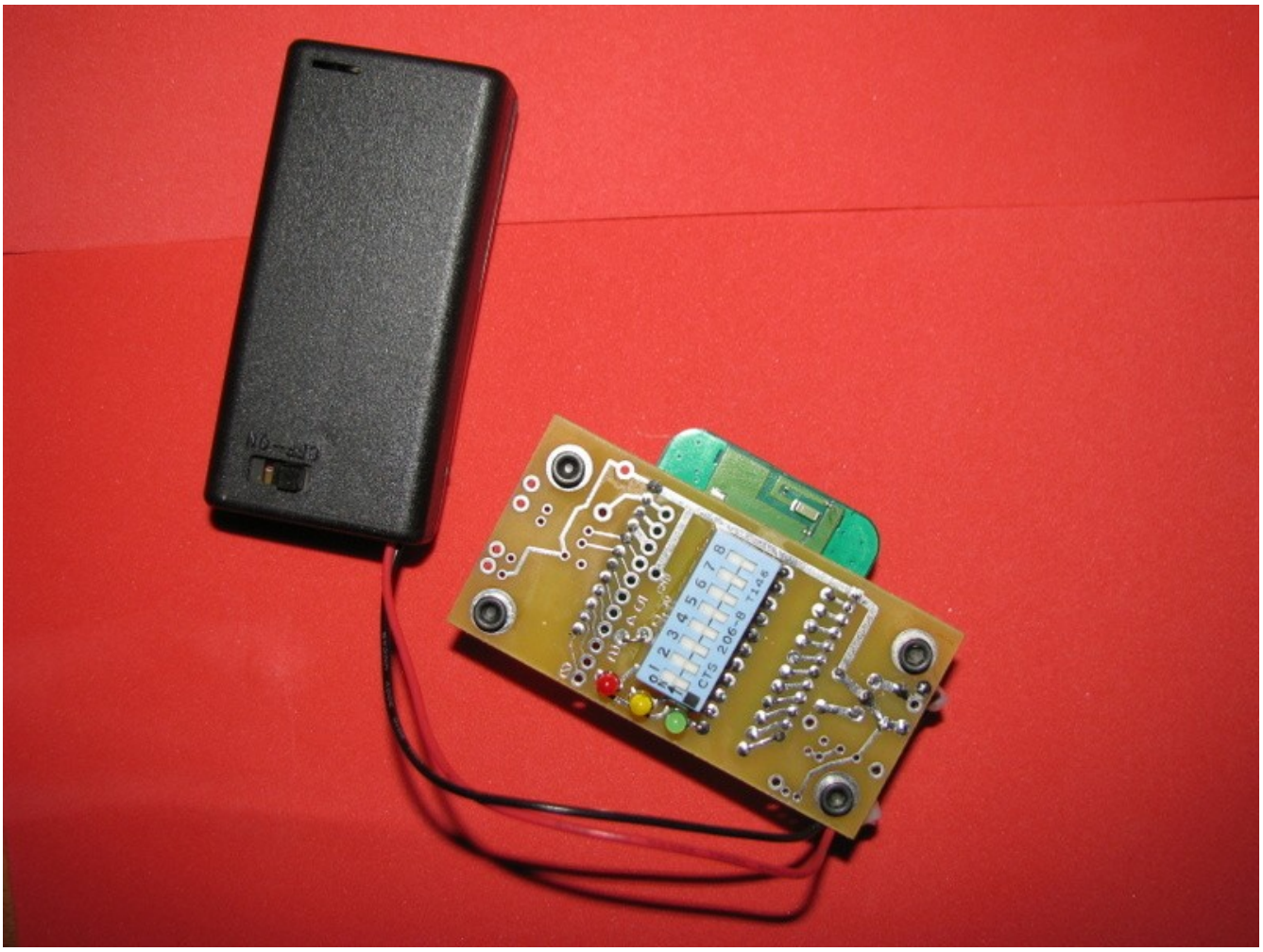
The Mesh central node (3.3 V TTL) is serially connected to a MaxiMite “clone” for message processing from the mesh network.



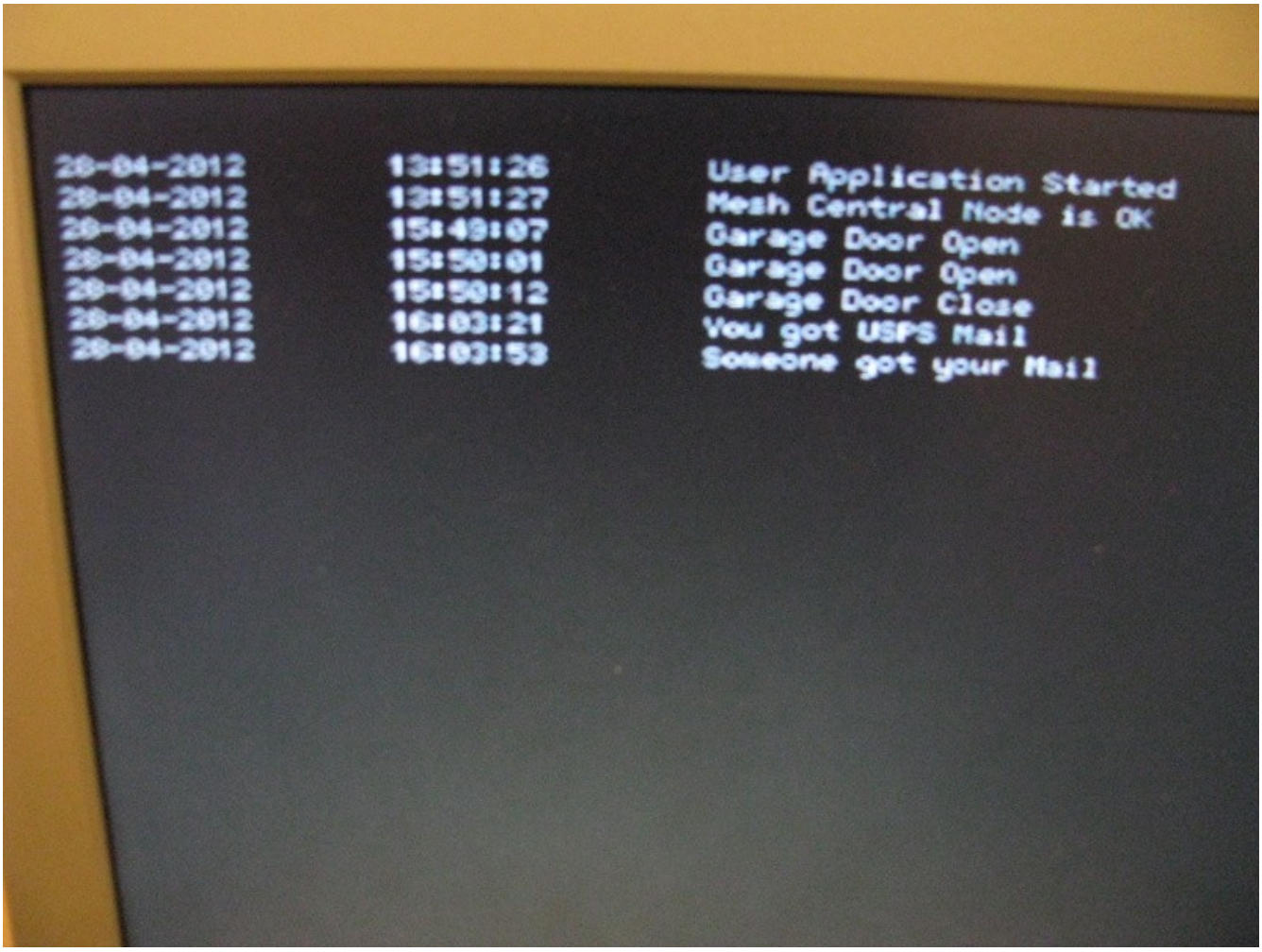
This is the picture of my Synapse mailbox node in a convenient screw-less snap enclosure.
This RF node is only powered up when the mailbox is opened then shutdowns for “zero power” consumption for very long battery life.



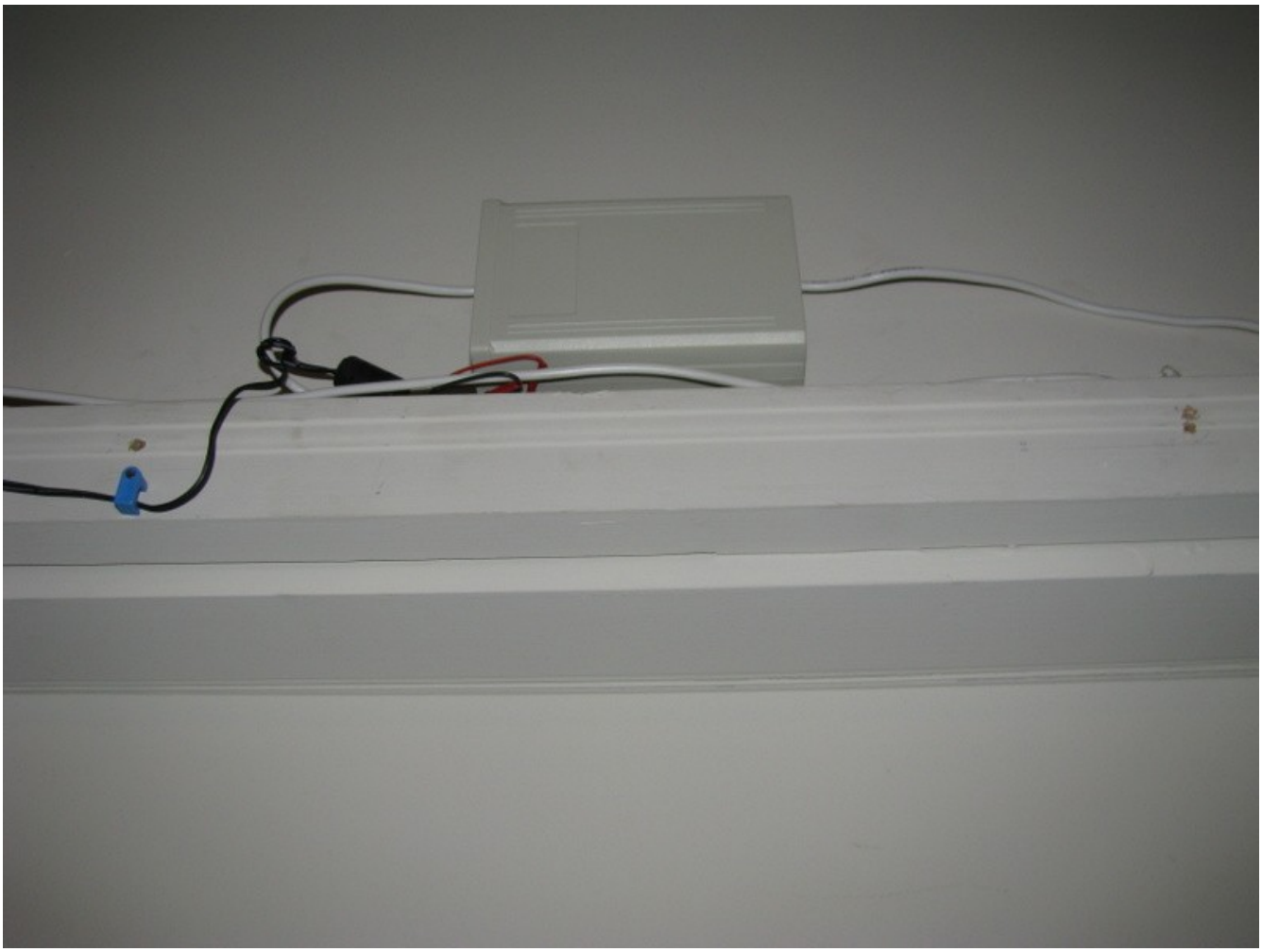
Bottom pic of hand held Synapse controller.



Top side of hand held Synapse garage door controller. This controller is not only used to control the garage door but for any other RF mesh node in the Synapse mesh network.

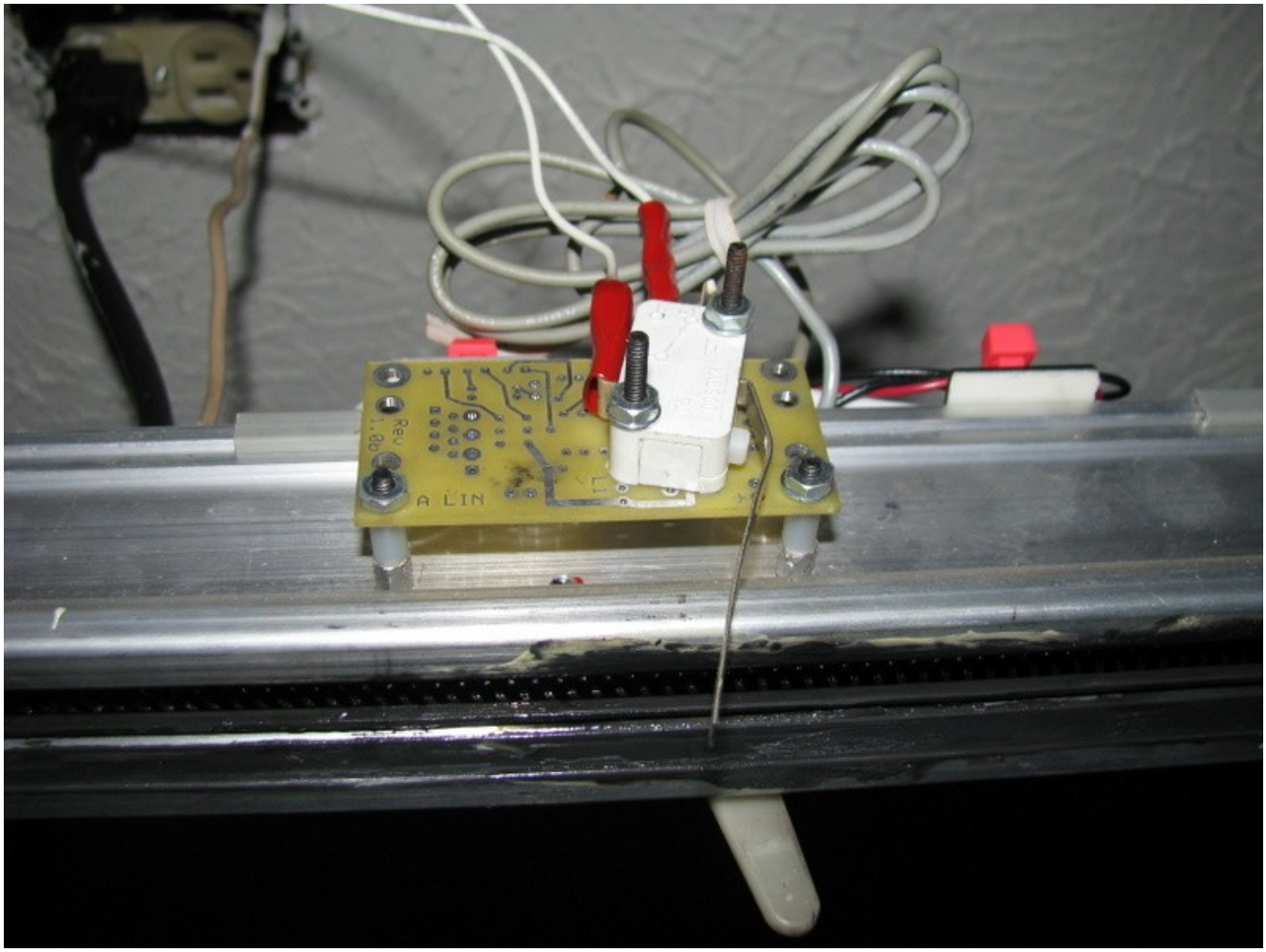


Message video logs from Synapse RF network



The Synapse RF garage door main controller. Two wires from the open/close limit switches and one (2 wire) in parallel with the push button controller is all that is needed to control the garage door. I pulsed a small relay (from Seeed depot) to activate the garage door. Inside the controller also has another precision RTC (DS3231M+) used to close the door automatically at night if left opened.

Industrial magnetic close limit switch to garage door controller.



Homemade open limit leaf switch going to garage door controller.

Pulse relay wiring, in parallel, to the push button on garage door switch.

Now, you are probably saying “what is so special using this Synapse mesh network than using a plain old simple RF modules?

Can your “old simple RF modules” do this …
Upload/debug/deploy wirelessly the RF module program code?
Remote control, even from the Internet, every mesh node in the mesh network?
Have the RF range of 3 miles LOS (line of sight) for RF module operation?
Power and channel mapping diagnostics and a RF sniffer for troubleshooting RF problems?

I made a Synapse hand held RF controller, for example, which has the following features that you cannot buy anywhere from a commercially made unit only at a very high cost.

This hand held Synapse RF garage door controller has the following features:
128 AES encryption for secure RF bullet proof node security.
Coded input switch sequence for secure garage door activation.

Can be controlled up to 1500 feet (with exceptions) (457 meters) away LOS - line of sight.
Can read and display the garage door open/close status. <----<<<<
Can read and display it's own battery level. <----<<<
Can send its battery level to the Synapse network for low battery alerts and logging.

This Garage door control activation is very secure - no one can just press a button if this controller is lost or stolen. The 8 position DIP switch is "coded" for security and has timed lockouts. Activating the wrong key switch sequence will "time lock" and disable the controller from further garage door activation. By using software, you can easily render this lost or stolen controller useless.

In my small mesh network, I only have a hand held RF controller, garage door main controller, mailbox mesh node and a mesh RF central node used for status. I will be expanding this mesh network to include an environment/security RF node (temp,humidity, light & PIR motion), lighting/lamp appliance control and perimeter security. Stay tuned ...