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Building a casing for BLE113: What materials are suitable?

Answered

Ash Eldritch
asked this on March 4, 2014, 02:33

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Hiya! We are building a BLE-enabled bicycle alarm. We need a strong outer casing for the electronics, ideally we'd use steel but also looking at polycarbonate-ABS mix. Of course the key thing is to get this as strong as possible while still being porous for the radio signal.

Any suggestions are very welcome!

Thanks,

Ash

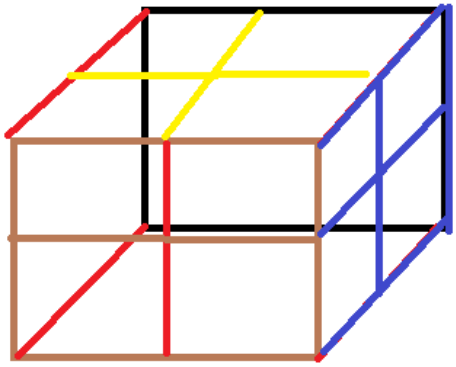
0 people would like this to be answered. Be the first!

Comments

Chung Mui
Bluegiga
Technologies

Hi Ash Eldritch

I would suggest the outer casing is made of metal frames, see below figure, and covered by polycarbonate-ABS. The metal frame will still degrade the radio signal but it will be better than a "shielded" meta enclosure. The bigger hole, the better RF signal. If the requirement for the communication distance is not too long, I think it will work. I can't tell the exact communication distance because that depends on the structure of the metal frame and the product. I would suggest that you make a prototype for communicate distance test.



March 4, 2014, 05:27

Ash Eldritch

That's a great suggestion, thanks! We think we might swap it round and have the metal frame on the outside, wrapping the plastic. It will look super sexy :)

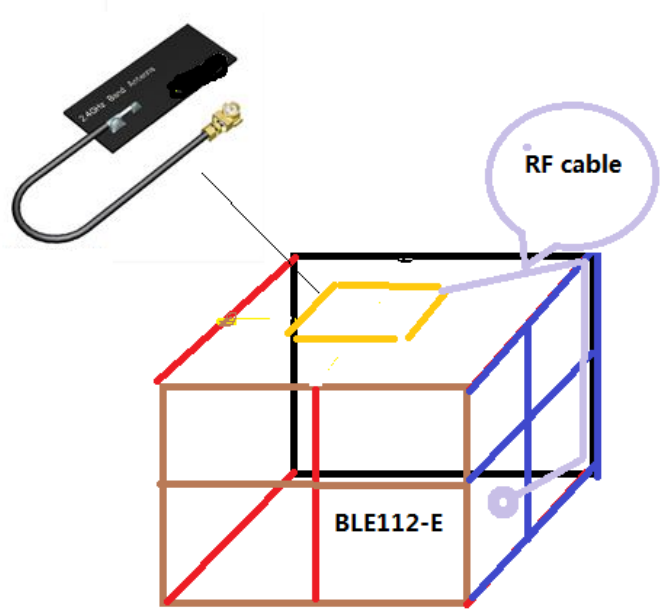
March 4, 2014, 10:09

Chung Mui
Bluegiga
Technologies

My colleague had a comments for the above suggestion: if the product is not big enough, then the holes may not big enough to "leak" RF signals. He suggested that you do a feasibility study first.

If the first solution does not work, the second suggestion is stick a external 2.4GHz PCB antenna (also called WiFi PCB antenna) to one of the surface (inside) of the casing. You can use BLE112-E which has U.FL connector for external antenna. Note the antenna supplier may need to fine tune the PCB antenna to get the best radio performance.

Support



March 5, 2014, 04:21

Ash Eldritch

I really like this idea too, of an external antenna. One question though is do we have to go through the wireless certification process if we use an external antenna? I know you have a list of antennas that are already supported, but this small wire antenna does not seem to be in that list?

Thanks for all your help!

March 10, 2014, 09:43

Chung Mui
Bluegiga
Technologies

Answer

Hi Ash Eldritch

-- One question though is do we have to go through the wireless certification process if we use an external antenna?

Chung>> Yes.

-- I know you have a list of antennas that are already supported, but this small wire antenna does not seem to be in that list?

Chung>> You are correct -- this kind of PCB antennas are not included in the list.

Our recommendation is to do a feasibility study for the first suggestion first. If the first solution does not work, you may need backup solutions, for example, PCB antenna.

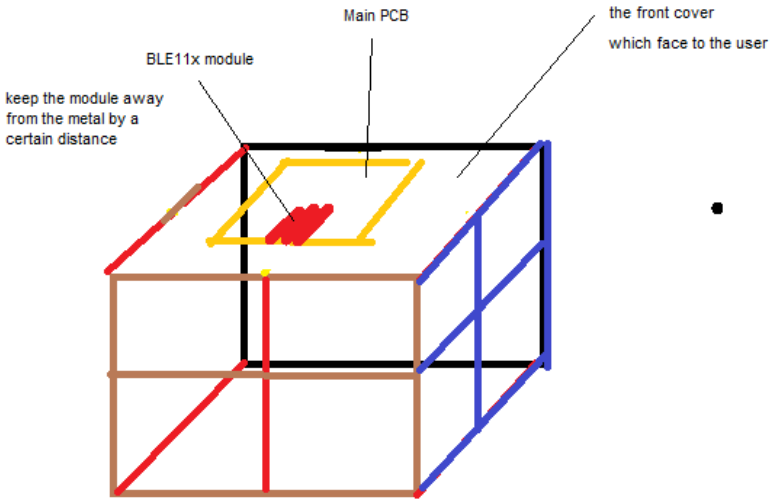
One more idea has just come up in my mind:

1. Put the main PCB board close to the front cover which faces to the customer. The front cover should not have any metal.

2. Keep the module away from the metal frame by a certain distance.

3. Note this solution may have very strong directivity in certain directions.

4. This solution should look like the external antenna solution.



March 10, 2014, 13:25

Ash Eldritch

Hi! Will the BLE121LR make this design easier? Would I still need an external antenna?

November 24, 2014, 02:00

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