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Tested "cable replacement" sample for ble113

Answered



Bruce Jestes

asked this on October 4, 2013, 14:00

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Hello,

My name is Bruce and I come from Vitact company. We need support for run the example "cable_replacement" which we found in your file "ble-1.1.1-71.zip".

We are working with Ble113 development Kit and with it's dongle, but all samples in this ZIP file was writed to Ble112. But we change some lines in the proyect (like your team explain as), and then ble113 was recogniced in compilation process.

Now we found another problems, when we try to send and receive data with Blugui and terminal softwares, both don't show nothing (nothing in GATT, logs or terminal) .

We put trace lines to show messages in the display to follow the incoming events. Then the trace of RX event never was shown.

Looking again the document "BLE_Application_Note_CRP_Sensor.pdf" for understand it better, we found some differences (We don't know how important are this changes in this trouble, but we explain it):

- Two lines less in event "system_boot":

```
connected = 0
```

```
call gap_set_adv_parameters(32, 48, 7)
```

- One event less "connection_status", setting "connected = 1". But if we add this funcion in the sample, compiler throw us one error in this function. We find out a mistake in this header function in both PDF documents: in PDF sample and in the API doc ("BLE_Stack_API_reference_v2.2.pdf")

The Sample said:

```
event connection_status(connection, flags, address, address_type, conn_interval, timeout, latency)
```

The API said:

```
event connection_status(connection, flags, address, conn_interval, timeout, latency, bonding)
```

Then we try mixture both, and then compilation work fine:

```
event connection_status(connection, flags, address, address_type, conn_interval, timeout, latency, bonding)
```

- And Two lines less in event "connection_disconnected":

```
connected = 0
```

```
call gap_set_adv_parameters(32, 48, 7)
```

We add all this differences in the our code and the app don't work like we expected.

¿Please can you help us?

¿Have the same sample "cable_replacement" completely tested for Ble113 for download it?

We appreciate your help in advance

Bruce

3 people would like this to be answered.

Me too!

Comments



Sam Pullen
Bluegiga
Technologies

Hi Bruce,

Please see the attached improved versions of the cable replacement examples. It has been tested to work on both BLE112 and BLE113 modules, and also includes both master and slave roles and BLE112 dongle variants.



[cable_replacement_server_and_client.zip](#)

October 4, 2013, 14:06

Support



Sergey Nelyub

Good evening!

We are trying to connect BLE112 and BLE113 modules using Cable replacement service (your example).

First of all we used BLEGUI with BLED112 in scanning mode, BLE112 (Slave BGScript for BLE112) module in advertising mode and BLE113 (Slave BGScript for BLE113) module in advertising mode. In BLEGUI application only BLE112 appears. BLE113 is not detected.

The same situation is taken place when we use BLE112 (Master multiconnections BGScript for BLE112) module instead of BLED112. BLE112 modules can see each and work together other while BLE113 is invisible. What might be the problem? Thanks a lot!

Best regards,

SANEL

October 9, 2013, 17:05



Marco Sala

Hi everybody!

I'm experiencing the same issue. I've already tried with different devices (2x BLE113) and computers (2 x Windows PCs), but I can't manage to make them work.

help is welcome!

thank you, regards

Marco

October 10, 2013, 22:00



Sergey Nelyub

Good day!

That is continuation of my previous comment. We tried BLE113 only, no BLE112 this time. It is strange but BLE113 can't see each other too. We tried **tested** Cable Replacement Service. We connected 2 BLE113 modules to 2 PC terminals. First BLE113 is running BGScript server example, while second BLE113 is running BGScript server example. Both project.xml have <device type="ble113" /> string. USB and I2C is not used.

All we have seen are 2 first lines from BGScripts:

**** Boot: Connection Slave, GATT Server ** Version: et-0.8 **** from one terminal

and:

**** Boot: Connection Master, GATT Client ** Version: et-0.8 **** correspondingly from another

These 2 strings let us state that BLE113 modules work is certain sense. But not work properly. No Bluetooth functionality. We even add soft timer in the BGScript code and then we timer event come BGScript transmit 20 bytes each second.

My question is as follows:

Can somebody from Bluegiga staff test the Cable Replacement Service on BLE113 again and tell us why our modules don't work properly? Thanks.

Best regards,

SANEL

October 11, 2013, 10:24

Sami Kaislasuo
Bluegiga
Technologies

Please verify with the BLE SW Update Tool that the license key is installed in the module. If there is no license key installed the BT radio will not work and thus the module cannot be connected.

If the license key is missing please issue a support ticket where the serial number of the module is stated.

Cheers

October 11, 2013, 12:19



Sergey Nelyub

misprint:

... while second BLE113 is running BGScript **CLIENT** example ...

October 11, 2013, 12:20



Sergey Nelyub

Sami,

Thank you for your answer.

In BLE Update application I click Info button and see license key. That is a long hex number. Copying that number and pasting it into License key field doesn't have any effect. BLE113 modules still don't see each other.

Could you describe in more details what should I do? Thanks.

Best regards,

SANEL

October 11, 2013, 13:03

Sam Pullen
Bluegiga
Technologies

Hi Sergey,

I just flashed 2 BLE113 dev kits.

One with master closed system

One with slave closed system

Please see attached examples which I have added the hex files for the BLE112 and BLE113. Each has its own project file.

After opening both serial ports I could reset the modules and see the boot events. Then they connect and I could send data transparently. Please see attached screenshot.

 [cable_replacement.zip](#)

 [ble113_to_ble113_cable_replacement_screenshot.png](#) (quick view)

October 11, 2013, 15:14



Sergey Nelyub

Thank you, Sam!


I have just tried your example - no result. See my attached file. Only 2 first strings.

Could you comment Sami's idea that the problem might be because of license key. File is also attached. Thanks.

Best regards,

SANEL

 [print_screen.png](#) (quick view)

 [print_screen_license_key.png](#) (quick view)

October 11, 2013, 15:53



Sergey Nelyub

not right file I have attached...

October 11, 2013, 15:55



Sergey Nelyub

The right one. Sorry.

 [print_screen.png](#) (quick view)

October 11, 2013, 15:59

Hi Sam,

First at all, thank you for your quickly answer, but now I have 3 questions more:



Bruce Jestes

QUESTION 1:

I was testing the codes you send before, and concretely I have a question about the next projects:

- demo-spp_over_ble-ver08-evboard_master-closed_system. This run in our a BLE113 in our "Ble113 development kit" like a Master
- demo-spp_over_ble-ver08-dongle_master-closed_system. This run in our BLE112 (dongle) like a Slave. In order to do that, I needed use a very good article of your workmate Jeff Rowberg, "Run a BGScript application on the BLE112 USB dongle" (<https://bluegiga.zendesk.com/entries/22810076--HOW-TO-Run-a-BGScript...>).

When I was updated the projects in the devices, both work fine: start, establish connection, and transparent data can be throw between both devices.

But now testing the communications, sending 1 high packet (file 1024 bytes) and sending smaller packets in a loop (small (4 bytes), medium (90 bytes)), the communication lost so much packets (in all this cases).

I don't know the reason, can you explain why is happening that? What I must to do to correct it? I think that the signal are in the best case, because the devices are at less of 30 cm of distance and without interference.

QUESTION 2:

With other dongle BLE112 (with default firmware) the BleGUI app don't recognise the BLE113 (with slave projects) in the scan process, when it is loaded with some samples (like you send in this article). What is the reason?

QUESTION 3:

Who devices can find and interact with the Ble113 (or BLE112)? ex: My Android smartphone (with default bluetooth scan software) don't find its

Thank you very much for everything and greetings
Bruce

October 11, 2013, 19:07



Bruce Jestes

Sorry, but I wrote erroneously the last comment, in the second point i wanted to said:

- demo-spp_over_ble-ver08-dongle_slave-closed_system. This run in our BLE112 (dongle) like a Slave ...

October 11, 2013, 19:19



Bruce Jestes

More information about QUESTION 1:

- Sending: Master to Slave --- > lose data, like I explain before.
- Sending: Slave to Master --- > apparently no errors (some small tests).

October 11, 2013, 20:13



Sergey Nelyub

Good day!

Following the Sami Kaislasuo advice we sent license requests, got a response for BLE112 and BLE113 modules.

What are strange:

- 1) The license keys for our BLE113 modules are different from the license keys that have been installed into modules by manufacturer. We had updated license keys using these new keys. But nothing happened - no BT radio functionality had been appeared.
- 2) When we had been testing CRS for our BLE112 modules (before the problems with BLE113 modules started) we hadn't any troubles with license keys. No license keys we had inserted. It had worked fine without them. We had bought BLE112 modules as a part of DKBLE112.

The deadline for our project is coming soon but we can't even make our modules work. What else can be done? Thanks!

Best regards,

SANEL

October 13, 2013, 12:08

Hi Sergey

Answer



Sam Pullen
Bluegiga
Technologies

The BLE license key will change each time we generate one, this is expected behavior and all will work with the module.

I have tested many times the firmware version I attached to this thread with the BLE113 dev kit at both ends and I can get the connection to open and send data transparently. Have you tried using Putty terminal as that is what I am using. SW flow control could be causing a problem maybe. Power on the master then the slave and you should see the debug prints as shown in my screen shot above.

October 15, 2013, 20:50



Sergey Nelyub

Good night, Sam! We have solved the problem using the latest SDK. Now it works ok, thank you for your help! Best regards, SANEL

October 17, 2013, 01:10



Bruce Jestes

Hi Sam,

Were you able to make some progress on the questions that I formulated? Thank you.

Best regards,

Bruce

October 18, 2013, 13:00



Sam Pullen
Bluegiga
Technologies

QUESTION 1:

I was testing the codes you send before, and concretely I have a question about the next projects:

Answer

- demo-spp_over_ble-ver08-evboard_master-closed_system. This run in our a BLE113 in our "Ble113 development kit" like a Master
- demo-spp_over_ble-ver08-dongle_master-closed_system. This run in our BLE112 (dongle) like a Slave. In order to do that, I needed use a very good article of your workmate Jeff Rowberg, "Run a BGScript application on the BLE112 USB dongle" (<https://bluegiga.zendesk.com/entries/22810076--HOW-TO-Run-a-BGScript...>).

When I was updated the projects in the devices, both work fine: start, establish connection, and transparent data can be throw between both devices.

But now testing the communications, sending 1 high packet (file 1024 bytes) and sending smaller packets in a loop (small (4 bytes), medium (90 bytes)), the communication lost so much packets (in all this cases).

I don't know the reason, can you explain why is happening that? What I must to do to correct it? I think that the signal are in the best case, because the devices are at less of 30 cm of distance and without interference.

Data loss when using the cable replacement examples would indicate to me a problem with the hardware flow control. What is your setup please? Are you using a USB to serial cable connected to a PC. Most of those converter cable also have problem with HW flow control and lose data. Have you tested with a MCU connected to the UART? We have some more information in the following article about data loss <https://bluegiga.zendesk.com/entries/23143152--REFERENCE-Using-or-bypassing-flow-control-with-UART-communication>

QUESTION 2:

With other dongle BLE112 (with default firmware) the BleGUI app don't recognise the BLE113 (with slave projects) in the scan process, when it is loaded with some samples (like you send in this article). What is the reason?

If BGScript is used then the BGAPI is disabled and cannot be used. Or if you mean you can not see the project on another device when it is advertising then it could be you need to use observation mode.

QUESTION 3:

Who devices can find and interact with the Ble113 (or BLE112)? ex: My Android smartphone (with default bluetooth scan software) don't find its

Not all Android devices have Bluetooth 4.0 hardware and software support. Native BLE support was added in Android 4.3. Apple devices support BLE from iPhone 4s and above and iPad 3 and above.

October 18, 2013, 14:09



Christian Koch

Hello,

my name is Chris and I'm a student of mechatronics aiming at a bachelor's degree.

I flashed 2 BLE113 dev kits. One with master closed system and one with slave closed system. (from the example above)

How can i connect the two development kits via Bluetooth?

I have installed Putty, BLE GUI, and the Update Tool but i don't know how can i see that the both ble113 dev kits are connected?

Maybe someone can explain me the sourcecode which can send data from one ble113 to another ble113 via Bluetooth.

Please can you paricularly describe how should i do?

Best regards,

Chris

October 25, 2013, 12:41



Sam Pullen
Bluegiga
Technologies

The master connects to the slave by detecting 'ET' in the advertisement packet of the slave device. If you connect a terminal like Putty to each kit you will see printed debug messages when the module boots, connects and enables streaming mode.

Answer

October 25, 2013, 12:47



francois chevalier
air liquide

Hy Sam,

I have read with a lot of attention this topics. I have downloaded your files and try on my dev kit ble113.

I'm totally new in the technology and my wish is to create cable replacement between the dev kit BLE113 and a dongle (BLED112) plugged in a PC running W7.

I have tested by following the application note "cable replacement" but the result is under expectation....

I d'ont get the string as it is explained in the section 5.1.5 but only wrong chars.

Any suggetion and/or procedure ti create cable replacement between DKBLE113 and BLED112 USB ?

Best regards

François CHEVALIER

December 11, 2013, 16:41



Jeff Rowberg
Bluegiga
Technologies

Hi François,

I would recommend looking at this example project, which includes project files and pre-built binary firmware files for multiple module/peripheral configurations:

- <https://bluegiga.zendesk.com/entries/29185293--BGScript-spp-over-ble-AT-command-SPP-implementation-for-BLE>

Note the attached PDF application note on that example as well.

December 15, 2013, 05:21



francois chevalier
air liquide

Thanks a lot Jeff.

I have followed you advises and it's working now.

Did you know if it exist a way to have this proprietary profile for ANDROID.

My purpose is to communicate from a app on smartphone to configure a device running a MODBUS master protocol ?.

Anyway, thanks again for your help.

Regards.

François CHEVALIER

December 17, 2013, 10:32

Hi François,

It could definitely work with Android, but we don't have an implementation of this yet. There is an iOS app nearly finished which works with this, but it still needs a bit of tweaking before publishing. The app note that describe the GATT structure may be enough for you to create an app yourself in Android, or



Jeff Rowberg
Bluegiga
Technologies

you can wait for us to create the Android counterpart as well.

December 17, 2013, 15:32



Edd Tury
LMI Corporation

Greetings,

I had my BLED112 dongle talking to my BLE113 dev board, but after reflashing them with the latest cable replacement hex they both seem to be working but will longer hook up. I tried to reflash the dongle but I am now getting: (see screenshot)

Any help would be appreciated.

Edd

 [BLUEGIGA ERROR.png \(quick view\)](#)

January 9, 2014, 14:31



Edd Tury
LMI Corporation

Well, when I connected to the dongle with another instance of teraterm I was able to get them talking to each other. Sweet.

January 9, 2014, 14:52



francois chevalier
air liquide

Happy new year for all and again thank for your time and support.


Jeff, i would like to suggest you a schematic of our futur interface, based on a BLE113, in order to communicate with our telemetry equipment. This simple implementation could allow us to use the cable replacement script loaded in the BLE113 module.

Could you give me your feedback on that point, and especially if we forget some connections.

Thanks for your help.

Best regards.

François CHEVALIER

 [ble113vsAlbar.jpg \(quick view\)](#)

January 10, 2014, 11:17



Jeff Rowberg
Bluegiga
Technologies

Hello François,

This schematic is pretty simple; it does not have the DC/DC converter for reduced current consumption, but with the BLE113 this is not such a big concern, especially if you are running on a bigger power supply. The pull-up on the RESET pin is not strictly necessary, if it is not connected to anything else, since the CC2541 does have its own internal pullup on that pin.

However, the default "cable_replacement" example (and most of our other UART-enabled examples) use the **UART1/Alt1** configuration, which is the following:

- P0_2 = CTS
- P0_3 = RTS
- P0_4 = TXD
- P0_5 = RXD

However, you have connect the UART pins as required for the **UART0/Alt1** configuration, which is the following:

- P0_2 = RXD
- P0_3 = TXD
- P0_4 = CTS
- P0_5 = RTS

This can be made to work with the cable replacement project, but it will require software modifications. If the specific chosen pin assignment is not too important to you, I would recommend using the **UART1/Alt1** configuration above instead.

January 10, 2014, 17:12

Hello,



Mauro Garcia

I'm also trying this example just for an easy way to connect an UART device through the bluetooth with my smartphone.

I find several problems. First I'm trying to follow the comments of other people in this post. I only see one that have tried to connect the BLE113 to the dongle for testing this UART / BLE communication.

I try to follow the same recipes:

BLE-VER08-DONGLE-MASTER-CLOSED-SYSTEM

BLE-VER08-EVBOARD-SLAVE-CLOSED-SYSTEM

But first problem there is not .hex in the dongle directories. So I try to build them with the Update tool. When I try to make Update, it says Building Project file failed :

Error, name collision in line 61

"event attclient_procedure_completed(connection, result, handle)"

"result" is already defined as global variable.

C:/Bluegiga/ble-1.2.1-91/bin/script_compiler.exe error:-1

So, I enter into the file dongle_conn_master_gatt_client.bgs and change in the line 61, result to result2 because it is not use any further in the rest of the file. So, no more problems in the compilation and I have the .hex file in the folder.

Then, with the Update tool, I build and update the BLE113 with the Slave_closed.

When I go to the GUI and I make a generic scan, nothing appears! Is not this way that the BLE should work? The Slave have the information (Server) and the Master is going to ask for it (Client). Or it is the rename of the result variable that breaks compilation?

What I'm missing?

Thanks in advance.

January 24, 2014, 12:42



Mauro Garcia

Just a small update.

I think I have screwed up the whole thing, because now, when I try to get in mode DFU, following the same procedure mentioned, I does not change to that mode any more.

Are the examples proposed for the dongle in this post safe for DFU mode OR I have to dismount the plastic case and "unbrick" my Dongle?

It is becoming frustrating.

January 24, 2014, 12:51

Edd Tury
LMI Corporation

While checking the module current I see a 50Hz signal that never quits. It seems to be waking up on its own every 20 msec and doing something. Is this part of the SPP profile? Or BLE stack operation?

January 31, 2014, 20:17

Edd Tury
LMI Corporation

Forgot to mention I'm using the sleep enabled version.

January 31, 2014, 20:18

Jeff Rowberg
Bluegiga
Technologies

Hi Edd,

This is the stack operation, waking up on the connection interval (which is 20ms). You can increase this interval to save power, at the expense of reduced potential throughput.

January 31, 2014, 20:32

Thank you.



Edd Tury
LMI Corporation

February 3, 2014, 14:59



francois chevalier
air liquide

Hy Jeff,

Just some information and a simple question.

Since we have talked together i have received our board equipped with the BLE113 and a efm32 micro from energymicro.

We have spend time on them, but it's working fine now.

I have a supplementary question : could it be possible to support both the SPP over BLE and a standart GATT profile like the heart rate sensor ?.

We could imagine to switch from one to the other with the use of the internal I/O by example ?.

Thanks again for your help.

Best regards.

François CHEVALIER.

March 3, 2014, 16:07



Jeff Rowberg
Bluegiga
Technologies

Hello François,

It is possible to use both of these at the same time as long as the BGScript (or BGAPI) application knows how to provide both types of data according to what is needed by the client. The SPP-over-BLE project primarily uses one particular GATT service with a custom 128-bit UUID; adding the heart rate service to the GATT structure (in gatt.xml) would be easily done by copying the **<service>** tag and all of its children from the "hr" example project from the SDK, and pasting in at the *end* of the SPP-over-BLE gatt.xml file (it is important to add it to the *end* so that the existing SPP functionality doesn't change, because the SPP BGScript relies on known attribute handles and does not actually do a GATT discovery).

The module would easily support this sort of combined application, though it would slightly reduce the maximum possible SPP throughput which is already somewhat low. If you only need to send short pieces of data infrequently over SPP, then it should be fine.

March 3, 2014, 16:21



stephane
BONNETIER

Hello Jeff,

We are using the BLE113 in SPP "cable replacement" mode for wireless modbus configuration of our device.

We want to use it continuously power on, the BLE module sending advertisement periodically (typically every 2 or 5 seconds) until a connexion happens.

We expect the BLE113 to have an average power consumption of less than 20µA during the advertising process i.e few µA between advertisement messages.

So we tested it, it works but we measured a power consumption of 6 mA, the module being loaded with the "cable replacement" script.

Do you have a BG script that set the BLE in sleep mode?

How can we reduce the power consumption of the "cable replacement" script?

Please find attached the schematic.

Thanks you in advance for your prompt reply,

Stéphane

 BLE.pdf

March 4, 2014, 15:38



Jeff Rowberg
Bluegiga
Technologies

Hello Stéphane,

The SPP-over-BLE project currently does not support sleep mode. For a previous discussion on this, please see the following topic:

- <https://bluegiga.zendesk.com/entries/38949023>

This is a feature which will be added to a later version of the project, but it is not implemented at the moment. The "cable replacement" script is built on the same concepts as the more complex SPP-over-BLE project, and it also does not have sleep mode enabled. The main reason for this is that the UART receiver is not functional while the module is asleep, and so as a result you need to make use of the **<wakeup_pin>** setting in hardware.xml and assert this pin before sending any data, and keep it in the asserted state until after you have finished sending all data to the module.

The schematic you have sent looks like it should work for basic power and UART connectivity (and of course CC debugger programming), but it does not appear to have any GPIOs exposed for possible wake-up control. As this is the only viable way you can use UART and sleep mode at the same time, you would need to modify the design in order to support this behavior.

I would also note that the PCB layout could be improve a bit based on the photo you sent; the keepout area is correct, but the module should be placed on the PCB so that the antenna edge of the module is flush up against the edge of the PCB. In other words, in your photo, the module (and keepout area) should be moved "up" until it is lined up with the "top" edge, based on the orientation of the board in the photo. This will improve RF performance.

March 4, 2014, 16:36



stephane
BONNETIER

Hello Jeff,

Thank you for your explanation.

Is it possible for the BLE module to enter in sleep mode between advertisements >before< the connexion with the smartphone is established (before the DATA message), so before the need to use the UART to send or receive data?

In this way, we can use the BLE113 powered on battery that is advertising every 5 seconds with an average power consumption of 20 µA.

Also how can we change the advertisement period?

BR

Stéphane

March 4, 2014, 17:13



Jeff Rowberg
Bluegiga
Technologies

Hello Stephane,

The advertisement interval control is explained in section 7.3 on page 29 of the "BLE_Application_Note_SPP_over_BLE.pdf" document attached to the SPP-over-BLE project post online. Particularly, see the part explaining the "**ATC 03 05** ..." command. Note that a 5-second advertisement interval is far longer than most smartphones can reliably pick up; Apple's Bluetooth Design Guidelines document has some sample values for longer intervals, and the longest they recommend is about 2 seconds.

It would be possible for the module to sleep only while in a non-connected state and then remain awake during a connection, but this would also require modifications to the project to (1) enable sleep mode in general and (2) properly handle wake-up pin control internally based on the connection state. This might not be a good idea anyway though, since you also would not be able to send any AT commands to control the module (via UART) since this also would require being awake.

March 4, 2014, 18:40



Mathew Jury

Hi Jeff,

Is there any update from your comment dated December 17, 2013 10:32 above regarding working iOS and Android code to work with the transparent serial profiles in this thread. It seems there is quite a bit of interest in this solution. We are working on a commercial solution with the BLE113 and would like to hear more.

Thanks,

Mat Jury

5EL

New Zealand

April 24, 2014, 07:49



francois chevalier
air liquide

Hy Jeff,

I confirm the previous thread.

I'm curious to know if you intend to post a ANDROID sample app, like the IOS one, wich describe the use of the cable replacement software that we have loaded in the module.

The sample could be a simple terminal application.

Actually we are working with Windows terminal, but we plan to use ANDROID tablet !...

Thanks for your time and help.

Regards.

François.

May 15, 2014, 13:13



stephane
BONNETIER

Hi Jeff,

Do you plan to release an Android application source code that implement the GATT "Cable replacement"?

Thank you in advance,

May 26, 2014, 16:32



Jeff Rowberg
Bluegiga
Technologies

Hello,

We do still have more Android example projects planned including one to work with cable replacement, but have not yet had the resources to create them. They will be posted online under the Example Applications of the BLE products as soon as they are available; if you subscribe to notifications for the any of the BLE1xx modules, you should get an email when this happens.

May 26, 2014, 17:07



stephane
BONNETIER

Thank you for your answer, we start developping an android application on our own.

We would like to take a look on the iphone application source code but I do not succeed in downloading it from the corresponding section "Doc and software"

<https://www.bluegiga.com/en-US/download/?file=LMHlrlD3RjWkb3b4iJ3zTQ>

Could you attach the directory to this thread?

thank you

May 26, 2014, 17:41



Jeff Rowberg
Bluegiga
Technologies

The current iOS project is attached here.

 [Bluegiga_iOS_demo_app.zip](#)

May 26, 2014, 17:48



Thibaut Genet

Hi Jeff,

I'm Thibaut Genet, currently working with François Chevalier & Stéphane Bonnetier.

I've been testing the communication between the BLE 113 and the dongle BLE 112.

The BLE 113 has the cable replacement script which we have modified to reduce power consumption, by allowing the sleep mode and using a wakeup pin that remains to high level during the communication. The UART throughput has been set to 9600 baud to be able to use it with a low energy uart on our device.

The dongle BLE 112 has the original spp over BLE script.

We were trying to send files between two terminals (realterm) and we've seen many errors on the output file. So we reduced the file's size to a 100 characters and notice no error. Do you have any idea of what could happen?

In order to determine roughly the throughput of the BLE connection we toggle a pin to 1 just before we write the characteristic. And set it to 0 when we have the "indicated" event. The experiment gave us periods of +/- 40ms. As the characteristic is 20 bytes long, the throughput is +/- 500 baud. Is that correct? Is there any way to increase that throughput like increasing the characteristic size over 20 characters?

Best regards,

Thibaut

June 3, 2014, 16:25



Jeff Rowberg
Bluegiga

Hi Thibaut,

What is the nature of the corruption that occurs? Are you using flow control on both ends?

Increasing the characteristic size will not help with throughput due to the way the BLE protocol is design. GATT data transfer operations (read/write/notify/indicate) cannot send more than 20 data payload bytes at a time in most cases--one case allows 22 bytes, but this this is a polled read

Technologies

and does not apply to your application. It would be slower due to the polling mechanism used, even if it could be used in your case. The following articles contain more info on BLE connection timing:

- <https://bluegiga.zendesk.com/entries/24646818-Throughput-with-Bluetooth-Smart-technology>
- <https://bluegiga.zendesk.com/entries/22400867--HOW-TO-Maximize-throughput-with-the-BLE112-BLED112>

In short, a 40ms round-trip time for 20 bytes of data is expected due to the way indications work (one interval for sending the data, one interval for the acknowledgement, 20ms default connection interval = 40ms round trip time). The BLE protocol is not designed for high throughput. You can however increase this slightly between two of our modules by reducing the connection interval to the minimum allowed of 7.5ms. This can be done using the "ATC 03 06 06 00" command sent to the module, as explained on page 30 of the SPP-over-BLE application note.

It is **extremely** important to use hardware flow control for data reliability, and to ensure that the UART devices on each end are properly implementing it with precise timing. This KB article explains more:

- <https://bluegiga.zendesk.com/entries/23143152--REFERENCE-Using-or-bypassing-flow-control-with-UART-communication>

June 3, 2014, 18:06



Thibaut Genet

Hi Jeff,

Well we fixed the problem thanks to the new version, because I had version 1.0.1.2 for the BLE 112 and 1.0.0.1 for the BLE 113.

I have downloaded the 1.0.1.1 and remade all the changes for the low power consumption and it seems to work fine.

I'll try to reduce the connection interval and make new tests.

Thanks a lot,

Thibaut

June 3, 2014, 18:17



stephane
BONNETIER

Hello Jeff,

I am back with new questions about the "SPP over BLE" (cable replacement) script on BLE113.

The configuration is:

Smartphone sending a REQUEST to a microcontroller via the BLE113 and the microcontroller send back the RESPONSE to the smartphone via the BLE113.

The problem appears when the µC sends the RESPONSE to the BLE113 :

The "SPP over BLE" BGscript use RX WATERMARKS. When the BLE113 receive the first BYTE from the µC, an event RXWATERMARKS occurs and the BYTE is sent to the smartphone and the RXWATERMARKS are disabled until an ACK is received (indicate mode : 100 ms later). Next, another RX WATERMARKS occurs and the remaining bytes (up to 20) are sent in the same way.

Then, the time to send 1 response of 15 bytes to the smartphone is 140 ms instead of 40 ms.

How can we change this behavior to send the wjhole msg of 15 bytes in once? What is the best practice?

We tried to use a timer in the BG script to detect the end of a received frame but unfortunately it didn't works as expected, we miss some information about the inner behavior of the chip. do you have some documentation or BG script examples that implement the transmission of message with a timeout for end of reception detection.

Thank you in advanced for your time and response,

Stephane

June 23, 2014, 18:21



Jeff Rowberg
Bluegiga
Technologies

Hi Stephane,

The correct way to fix this is to change the RX watermark to the expected packet size (e.g. 15 bytes) instead of 1 byte. The watermark is triggered whenever there are *at least* the required number of bytes available, but there may be more than that in the buffer. You would then use the `system_endpoint_rx` command to read **exactly** 15 bytes, rather than however many bytes are available.

The "length byte" packetization approach demonstrated in this example is also possible:

- <https://bluegiga.zendesk.com/entries/28461493--BGScript-uart-echo-packet-UART1-Ait1-loopback-local-echo-with-watermarking-and-packetization>

This allows for reliable reading of varying packet lengths. However, it is more complex.

June 23, 2014, 22:27



Thibaut Genet

Hi Jeff,

I am still trying to make a more efficient script for cable replacement but I face many problems.

- When I add one more global variable to my script (just "dim modbus_size"), I have an error on the connection of a remote device and the module reboot. Is it possible that we ran out of memory? The only line in the BGScript log which changes is the BGScript size in flash memory which is 10299 bytes. We bypassed this problem by declaring an array of 2 bytes instead of 2 variables.
- When the program starts, rx watermark is set to 3 bytes so we can receive the beginning of the modbus message. Let's say "0xBB 0x03 0x04" The third byte is the data size. So we set again the rx watermark to 6 which is the data size + 2 bytes for CRC. But on the next event rx watermark the size returned is 3. So my question is does rx watermarks refer to the absolute index in the reception buffer of 64 bytes or does it refer to the number of bytes that have not been read yet?

Thank you for your help.

Thibaut

June 25, 2014, 17:45



sandheep
balasubramanian

Hi Jeff

I'm new to the bluegiga. I like to communicate two module BLE113 each other. each module is connected to a different hard ware.

I have tried many ways that files available in the Zendesk but non of that working good.

could you help me in this case ?

I like to get a example program to connect to module. and what ever send via uart should b in air and reach to the other module and display in a terminal via uart.

Thanks in advance

July 23, 2014, 09:24



Jeff Rowberg
Bluegiga
Technologies

Hello Sandheep,

The best example for this is the SPP-over-BLE project that was linked previously:

- <https://bluegiga.zendesk.com/entries/29185293--BGScript-spp-over-ble-AT-command-SPP-implementation-for-BLE>

This, along with the PDF application note which is attached to that article, is the most comprehensive and easy-to-use tool for opening connections like what you are after. This and the much less complex cable replacement project are the only examples we have which do what you want.

July 23, 2014, 16:44



sandheep
balasubramanian

Hello Jeff

Thanks for your response.

Let me try with this I was trying with out connecting RTS and CTS as a open system.

Whats is meant by **Send the command "ATP" to enter auto-connecting ping-pong mode on both devices.**

what this comment for is this to me done in terminal window?

After this step will the module will be visible in a mobile phone Bluetooth search 4.0?

auto-connecting ping-pong - What mode is that ?

Is that the same program should be downloaded in the both device ? or is that any thing to be changed?

Thank you

Sandheep

July 24, 2014, 14:56



Chung Mui
Bluegiga
Technologies

Hi Sandheep

-- Whats is meant by **Send the command "ATP" to enter auto-connecting ping-pong mode on both devices.**

Chung>> This means you need to use a terminal software to send the command of "ATP" to ask to enter ping-pong mode

-- what this comment for

Chung>> For the details, you please refer to section 7.10 in the app note. If a device is in Ping-Pong mode, it automatically bounces back and forth between the scanning state and the advertising state. If there are two devices in Ping-Pong mode and one is in advertising state and the other is in scanning state, then these two devices can connect to each other.

-- is this to me done in terminal window?

Chung>> Yes, please refer to Fig. 12 in the app note

-- After this step will the module will be visible in a mobile phone Bluetooth search 4.0?

Chung>> You better use ATA command to ask the device to enter advertising state so a mobile phone with BT v4.0 scan that.

auto-connecting ping-pong - What mode is that ?

Chung>> see above

Is that the same program should be downloaded in the both device ? or is that any thing to be changed?

Chung>> If you want two BEL11x modules to communicate, you should download the same firmware to both devices.

July 25, 2014, 04:58



sandheep
balasubramanian

Hi Chung Mui

Thanks for your response.

I have connected the two module. Let me start working with my application.

Thank you once a gain.

Have a great day

Sandheep

July 28, 2014, 07:42



sandheep

Hi Chung Mui

Hey while I'am checking the above said module the distance is very low just 1 meter.

can I improve that for a long distance. Is there any power option like XBee.?

balasubramanian

If its there so were can i do that and how?

Thanks in advance

Sandheep

July 28, 2014, 09:23



Chung Mui
Bluegiga
Technologies

Hi Sandheep

-- Hey while I'am checking the above said module the distance is very low just 1 meter.

Chung>> You can tell me your test setup and test environment as details as possible. Some photos will be helpful for me to understand your test setup.

-- can I improve that for a long distance. Is there any power option like XBee.?

Chung>> I am sure. The indoor communication distance should be longer than 10 meters if everything is correct. Yes, the Tx power can be changed. However, the Tx power is the max. value by default.

-- If its there so were can i do that and how?

Chung>> The default Tx power is the max. value and you do not need to change it.

July 28, 2014, 19:32



sandheep
balasubramanian

Hi Chung Mui,

Thank you for the response.

I have attached my set up. one I connected with laptop and other with a desktop.

so i have converted uart to USB via FT232R USB UART .

My testing place is 18X31 Sq.ft cabin.

I have also made the module in advertising mode and scan with my mobile i got the signal till 15 meters.

But when i connect the to Bluegiga modules the communication breaks up with in a small distance and go back to scan mode automatically.

Ya i have seen that powertx but it was high as you said.

Thanks in advance

Sandheep

 [IMG_20140729_154941_1.jpg](#) (quick view)

July 29, 2014, 13:54



Chung Mui
Bluegiga
Technologies

Hi Sandheep

Thanks for the photo.

Please refer to the section 5.3 BLE113-A Layout Guide if you would like to achieve good RF performance.

The problems I can find from from your prototypes:

1. The module is not at the edge of the PCB
2. The PCB is not FR4 material
3. There are materials under and near the chip antenna

4. There is no ground plane (the chip antenna is a monopole antenna and it needs a ground plane as a reflection plane)

I can expect shorter communication distance for your prototypes.

The following link also gives you addition information for BLE11x for good RF performance.

<https://bluegiga.zendesk.com/entries/27124003-BLE11x-A-Guidelines-f...>

July 31, 2014, 18:19



sandheep
balasubramanian

Hi Chung Mui,

Thanks for your response

Let me make a module accordingly.

I'm using a controller PIC18f6520 in that there is no flow control option. Can u help me how to make it linked(can a I/O can be made as RTS CTS by logics in my PIC). Or else is there any option to remove the closed system from bluegiga and make it a open system?

I want to connect one with PC and other with a PIC.

The module address is BLE SPP and macadds i want to change the BLE SPP as some other name how can i do that.?

In the Advertising mode I need a time limit if no module is connected for 5min the module show stop advertising. Were can i do that and how in the example program that u gave me.

Thank you in advance

Sandheep

August 1, 2014, 12:18



Chung Mui
Bluegiga
Technologies

Hi Sandheep

-- I'm using a controller PIC18f6520 in that there is no flow control option. Can u help me how to make it linked(can a I/O can be made as RTS CTS by logics in my PIC).

Chung>> You can implement the hardware flow control by GPIO pins. For the details, I think you can find some information on the Internet.

-- Or else is there any option to remove the closed system from bluegiga and make it a open system?

Chung>> You can also disable hardware flow control of BLE11x module by editing hardware xxx xxxx.xml file as following:

```
<usart channel="1" alternate="1" baud="115200" flow="false" endpoint="none" />
```

Notes:

1.If hardware flow control is disabled, data loss may happen.

2. Please change the UART baud rate to 9600bps to make the system a little bit more reliable without hardware flow control

-- The module address is BLE SPP and macadds i want to change the BLE SPP as some other name how can i do that.?

Chung>> You can search for "Device name" in the App note. Then, you will find the command to change the device name. You need ATW command to

write the "change" to the flash.

-- In the Advertising mode I need a time limit if no module is connected for 5min the module show stop advertising. Were can i do that and how in the example program that u gave me.

Chung>> You need to do it in the external host (PIC or PC). The external host sends ATH command to the module to stop advertising after timeout without connections.

August 4, 2014, 07:39



sandheep
balasubramanian

Hi Chung Mui ,

Thank you for your response

I have changed the UART baud rate to 9600bps in the below comment. But its not getting changed. Its still posses in 115200

```
<usart channel="1" alternate="1" baud="9600" flow="false" endpoint="none" />
```

What can i do then. Should I change some were else.

Thank you

Sandheep

August 4, 2014, 14:01



Chung Mui
Bluegiga
Technologies

Hi Sandheep

The spp-over-ble BGScript overrides the UART baud rate setting, which is in hardware.xml. You need the following commands to change the baud rate to 9600:

- 1.Open a terminal emulator software at 115200 8-n-1 no flow control
2. ATC 04 02 3B08
3. Change the baud of the emulator software to 9600
4. ATW

August 5, 2014, 06:31



sandheep
balasubramanian

Hi Chung Mui ,

Thank you for your response.

I have communicated .

Where could I get the list off all commend like ATC 04 02 3B08 also the full library function of BGscript

Now I could connect this to an android mobile with blue tooth 4.0 LE. When I use the same program its just saying encrypted. I would like to transfer the data as i did in my PC. Should I change anything?

When the Bluegiga in scanning mode its not displaying the mobile blue tooth. how can i make it visible and should pair with that.

Can you give me an example module of an android app to get data from Bluegiga and display it at frond screen also to send data from phone to the Bluegiga.

Thank you in advance

Sandheep

August 6, 2014, 15:22


sandheep
balasubramanian

Hey

The attached file is the two way communication between to BlueGiga device. Now i want to connect my mobile phone with Bluegiga module.

Do any one can help me were can i change my code. get connected with my phone.

Thank you in advance

 [script_ble11x_u1a1.bgs](#)

November 4, 2014, 14:10

sandheep
balasubramanian

Hi Chung Mui,

Were you able to make some progress on the questions that I formulated? Thank you.

Best regards,

Sandheep

November 5, 2014, 06:33

Chung Mui
Bluegiga
Technologies

Hi Sandheep

Please check if the attached doc can help (demo 1)? For Andriod App which can communicate with SPP-over-BLE, you can download it at

<https://www.bluegiga.com/en-US/products/bluetooth-4.0-modules/blueg...>

click [Example Applications] and download [BLE Android demo App \(.apk file\)](#) and [BLE Android demo App \(source code\)](#)

-- When the Bluegiga in scanning mode its not displaying the mobile blue tooth. how can i make it visible and should pair with that.

Chung>>You need to use a BLE App to scan the module (SPP-over-BLE). Note: the module (SPP-over-BLE) only scan for other BLE devices which support SPP-over-BLE only.

Procedure:

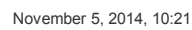
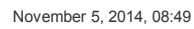
1. You need to send ATA command to ask the module to advertize first.
2. You do not need to go to <Setting> --> <Bluetooth> --> <Scan> on the phone. Instead, you just need to make sure Bluetooth is "ON" on the phone and the run the BLE App.
3. The App will scan for BLE devices and list all available BLE devices.
4. Just tag "BLE SPP xx:xx:01" and the App will make a connection to the module.
5. Follow the attached doc (page 8).

Log for your refer:

```
at
OK
ata //start advertising
OK
ADV
RING AC:22:0B:A5:CD:11 00 // When the phone makes a connect to the module
DATA // when you select the right service and characterisic and/or started "indication" (note: different Apps may start indication in different ways)
// in data mode
```

I hope my post helps.

November 5, 2014, 08:15



Save comment