SR Network Simulator Lite Guide

Version 01.01.03

Revision History

Version #	Remark	Date	Done By
01.01.01	SR Network Simulator Lite user guide	31st May 2017	Anand
01.01.02	SR Network Simulator Lite user guide	1st June 2017	Anand
01.01.03	SR Network Simulator Lite user guide	5th June 2017	Anand

Table of Contents

1. Purpose:

The purpose of this document is to provide detail about working and functionality of SR Network Simulator Lite-01.01.02 tool. Document gives details about communication between Coordinator, Router and End Device.

2. Scope:

This document gives details about device setup, device configuration and device communication. Useful for design team, development team, testing team and marketing team to create test setup.

3. Overview:

Using SR Simulator lite tool, user can communicate between Coordinator, Router and End Device. This document gives details about how to create SR Network and Send/Receive message between Coordinator and Router, Router and End Device and Coordinator and End Device.

Note: User will need 3 modules (To set: Coordinator, Router and End Device) and required 3 different systems. To do setup all 3 modules should be in 3 different systems.

- Home screen of SR Simulator lite- 01.01.02 will be displayed. Details of home screen are discussed below according to numbering given in following image.
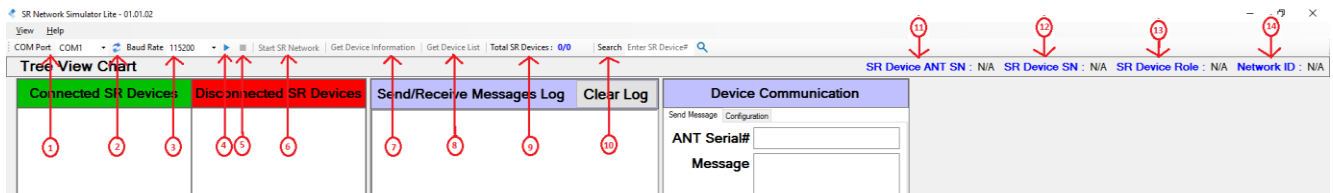

Figure 1: Home screen of SR Network Simulator lite

1. COM Port – This selection box allows user to select COM Port.
2. Refresh Icon- By clicking on this icon user can refresh for COM Port.
3. Baud Rate- This selection box displays Baud rate. This is can be changed from dropdown arrow besides Baud rate value.
4. Start Button- User can start communication by clicking on this icon.
5. Stop Button- User can stop communication in between by clicking in this icon.
6. Start SR Network- By clicking on this icon SR Network is created.
7. Get Device Information- User can get detailed information of device by clicking on this button. Information is displayed on communication screen of application home screen.
8. Get Device List- User can retrieve list of connected and disconnected devices by clicking on this button.
9. Total SR Devices- This option displays number of devices connected to your device.
10. Search- User can search any device by entering serial number.
11. SR Device ANT SN- This option displays ANT Serial number of user device.
12. SR Device SN- This option displays Device Serial number of user device.
13. SR Device Role- This option displays role of device. Ex: SR Coordinator, SR Router or SR End Device.
14. Network ID- This option displays Network ID of user device.

- Details of Connected SR Devices, Disconnected SR Devices, Send/Receive message Log, Device Configuration, Communication screen and Device Type Notation are given below.
  - Connected SR Devices- List of all connected devices are displayed in screen of "Connected SR Devices". Below figure shows an example for this.
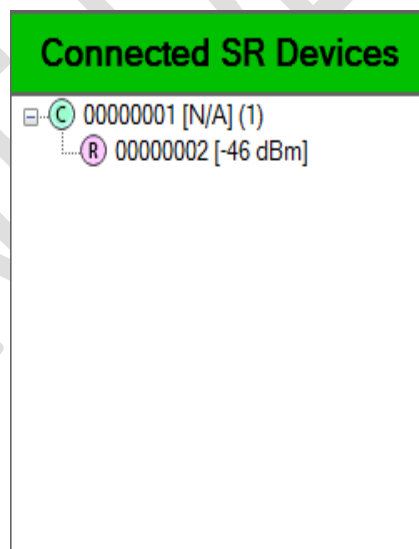

Figure 2: Connected SR Devices

- Disconnected SR Devices- List of all disconnected devices are displayed in screen of "Disconnected SR Devices". Below figure shows an example for this.
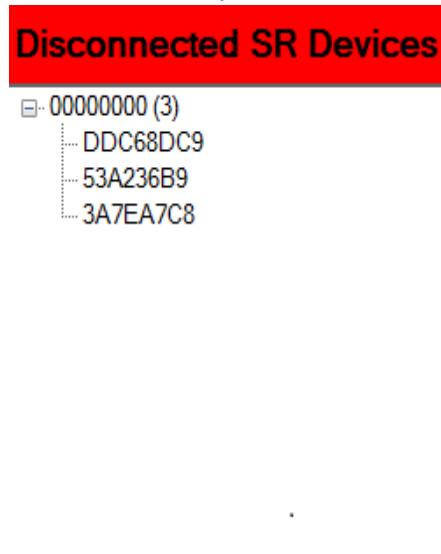

Disconnected SR Devices

□ 00000000 (3)
    DDC68DC9
    53A236B9
    3A7EA7C8

Figure 3: Disconnected SR Devices

- Send/Receive Message log- Messages that are sent or received are shown here.

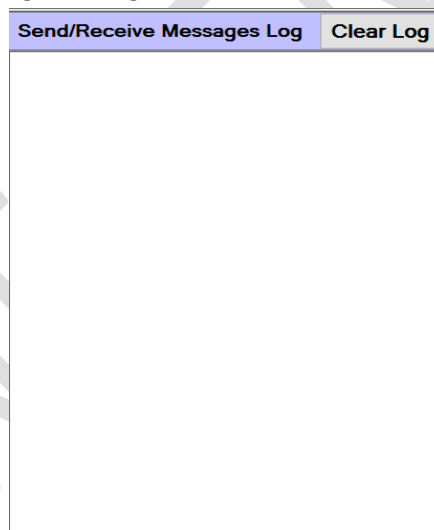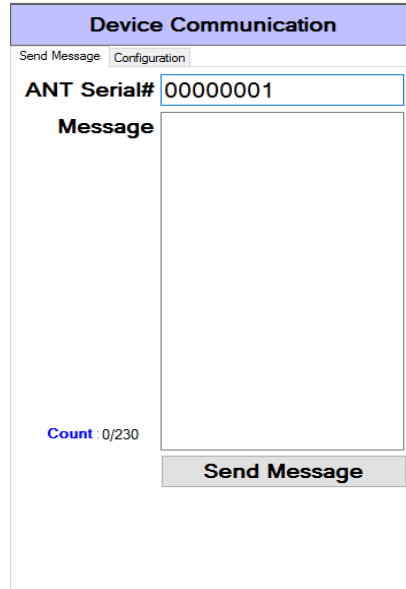**Send/Receive Messages Log** | **Clear Log**

Figure 4: Message log

- Clear Log- Log can be cleared by clicking on "Clear Log" button as shown in above image.

- Device Communication- Device communication has two settings.
    1. Send message- In ANT Serial # text box, User should type ANT Serial number of device to which data is to be sent. User can type any message here and send it by clicking on "Send Message" button given below. Below image shows "Send Message" text box. User can type maximum 230 characters.
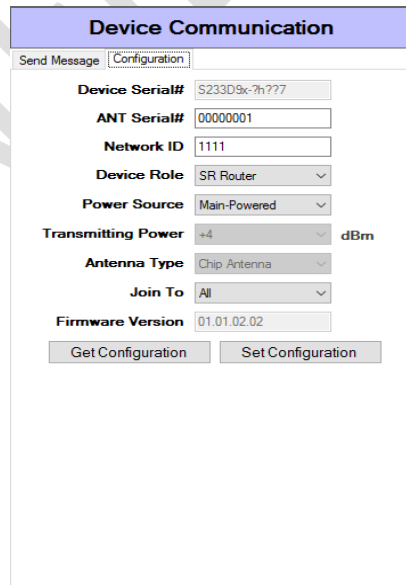

Figure 5: Send message

    2. Configuration- Detail of device is displayed in Configuration. As an example, below image shows the settings of Configuration.

Figure 6: Configuration

- Communication Screen: All communication messages are displayed in communication screen. Example: Message sent, Message received, Errors and Acknowledgement are displayed.

```
05/31/2017 14:59:49.732 PM :- COM port opened.
05/31/2017 14:59:49.751 PM :- Sending command for Get Device Information, waiting for response..
05/31/2017 14:59:49.969 PM :- Receive Message - 'Get Device Information'
05/31/2017 14:59:49.969 PM :- '+ACONFIG:0000000000000000,00000000,28,28,S233D98321&v??9??32,6,1,4,0,0,5,2,r9?1.02.02,?'
05/31/2017 14:59:51.002 PM :- Sending command for Get Device Network ID, waiting for response..
05/31/2017 14:59:51.202 PM :- Receive Message - 'Get Device Network ID'
05/31/2017 14:59:51.202 PM :- Device Network ID : 0(0000)
05/31/2017 14:59:53.356 PM :- Sending command for get device list, waiting for response..
05/31/2017 14:59:53.588 PM :- Receive Message - 'Get Device List'
05/31/2017 14:59:53.620 PM :- Index# 1, Shared Addr. : 0, ANT SN : 00000000, Parent ANT SN : 00000000, Dev. Status : 0, RSSI : 0 dBm, Register UTC Time : 5/31/2017 2:59:53 PM
05/31/2017 14:59:53.635 PM :- Receive Message - OK
05/31/2017 14:59:54.057 PM :- Sending 'Get Device Configuration Request' command to device, Waiting for response...
05/31/2017 14:59:54.288 PM :- Receive Message - 'Get Device Information'
05/31/2017 14:59:54.288 PM :- '+ACONFIG:0000000000000000,00000000,28,28,S233D9x-?h??7,0,2,32,6,1,4,0,0,5,2,2,01.01.02.02,0000'
05/31/2017 15:00:12.506 PM :- Sending 'Set Device Configuration Request' command to device, Waiting for response...
05/31/2017 15:00:28.896 PM :- Does not get response from the device, please try again.
```

Figure 7: Communication Screen

- Device Type Notation: Notation is displayed at the bottom of screen. It gives symbolic notification of device type as below.

Notation : Ⓒ SR Coordinator Ⓡ SR Router Ⓔ⓫ SR End Device(Battery-Powered) Ⓔⓜ SR End Device(Main-Powered)

Figure 8: Notation

4. Steps to connect Device with tool:

1. Open SR Network Simulator lite application.
2. After connecting device USB with system, refresh COM port list and select connected device COM Port.
3. Set Baud rate as 115200.
4. Click on Start button (▶) to start communication between tool and connected device.

   Device will be ready for communication.

- ## Test SR Network Structure:

1. USB Dongle- Coordinator.
2. SRH 233- Router.
3. SRH 233- End Device.
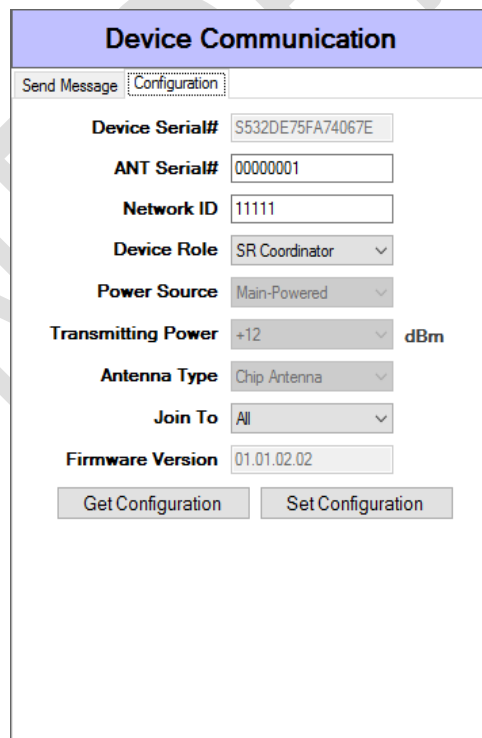
5. Make SR Network Commination Devices:

Connect device COM port with system, select connected device COM port from COM port list and click on start button.

- **Set Dongle as Coordinator in 1st system. Please refer below steps of 5.1.**

5.1 Steps to configure a device as Coordinator:

1. In 'Device Communication' go to 'Configuration' and click on 'Get Configuration'. It will display the current parameters set in device.
2. Set a unique ANT Serial #. ANT Serial # should be other than 00000000 (Default value will not work). For ex: Set ANT Serial # as 00000001 for Coordinator.
3. Network ID for all modules should be same.
4. From drop down menu of Device Role, select "SR Coordinator".
5. Power type, Transmitting power, Antenna Type and Firmware version will be displayed. (User can't set it from tool)
6. Select device type from 'Join to' list which connect current device with their parent device. ('All' will be displayed by default after you select 'SR Coordinator' from device role)
7. After setting all the parameters click on "Set Configuration" to save all parameters.

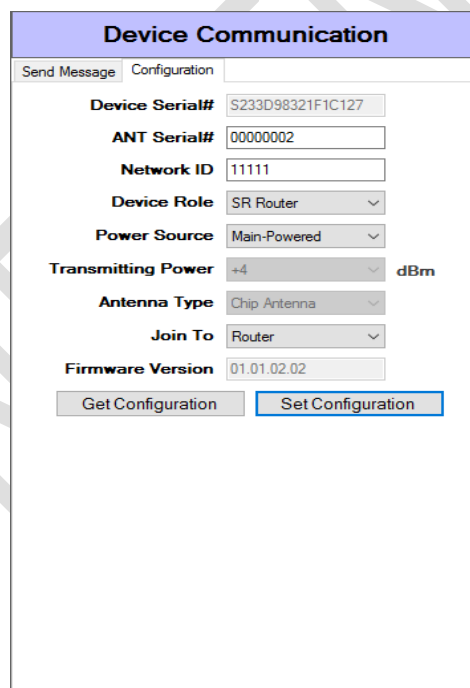Refer the below image for configuration setup of Coordinator:

Figure 9: Configuration parameters for Coordinator.

- **Set one SRH 233 as Router in 2ⁿᵈ system. Please refer steps of 5.2.**

5.2 Steps to configure a device as SR-Router:

1. In 'Device Communication' go to 'Configuration' and click on 'Get Configuration'. It will display the current parameters set in device.
2. Set a unique ANT Serial #. ANT Serial # should be other than 00000000(Default value will not work). For ex: Set ANT Serial # as 00000002.
3. Network ID for all three modules should be same.
4. From drop down menu of Device Role, select "SR Router".
5. Power type, Transmitting power, Antenna Type and Firmware version will be displayed. (User can't set it from tool)
6. Select device type from 'Join to' list which connect current device with their parent device. ('All' will be displayed by default after you select 'SR Router' from device role)
7. After setting all the parameters click on "Set Configuration" to save all parameters.

Refer the below image for configuration setup of SR-Router:
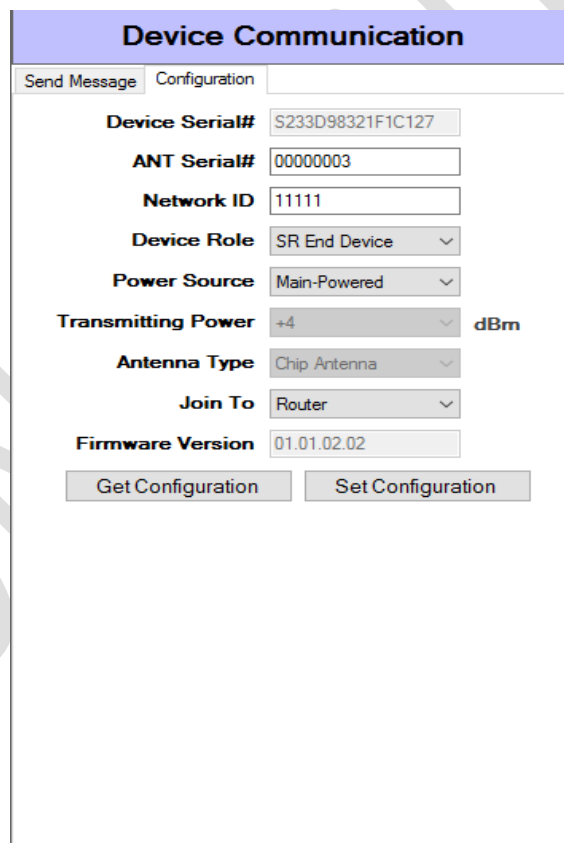
Figure 10: Configuration parameters for SR-Router.

- **Set another SRH 233 as Router in 3rd laptop. Please refer steps of 5.3.**

5.3 Steps to configure a device as SR End Device:

1. In 'Device Communication' go to 'Configuration' and click on 'Get Configuration'. It will display the current parameters set in device.
2. Set a unique ANT Serial #. ANT Serial # should be other than 00000000(Default value will not work). For ex: Set ANT Serial # as 00000003.
3. Network ID for all three modules should be same.
4. From drop down menu of Device Role, select "SR End Device".
5. Power type, Transmitting power, Antenna Type and Firmware version will be displayed. (User can't set it from tool)
6. Select device type from 'Join to' list which connect current device with their parent device. ('All' will be displayed by default after you select 'SR End Device' from device role)
7. After setting all the parameters click on "Set Configuration" to save all parameters.

Refer the below image for configuration setup of SR End Device:

Figure 11: Configuration parameters for SR End Device.

6. Communication:

For communication between any two devices, if message is sent successfully then there is a success message of 'Ack – Send OK' with 'Green' text color in Send Receive message log and if message sending is failed due to any reason then there is an error message of 'Ack – Send Fail' with 'Red' text color in Send/Receive message log as shown below.
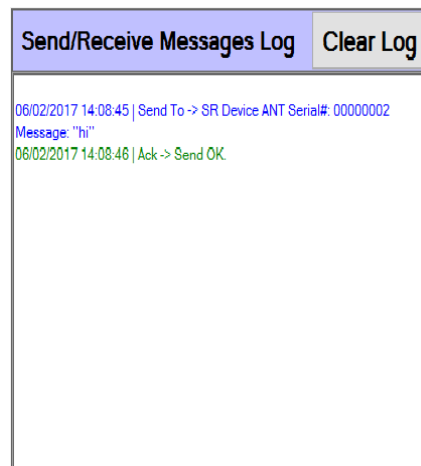
Figure 12: Success message.
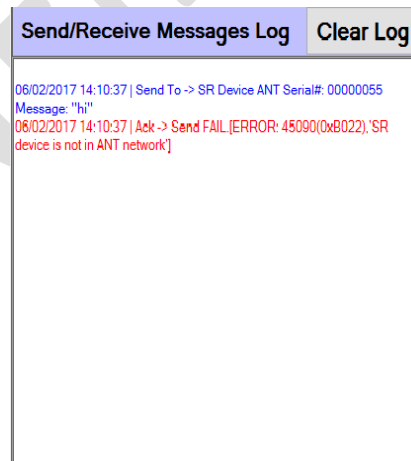
Figure 13: Failure message

6.1 Communication between SR Coordinator and SR Router:

- Message from SR Coordinator to SR Router: Type ANT Serial number of SR Router in SR Coordinator's "Send Message" window to type any message and Click on "Send Message" and message will be received by SR Router as shown below.
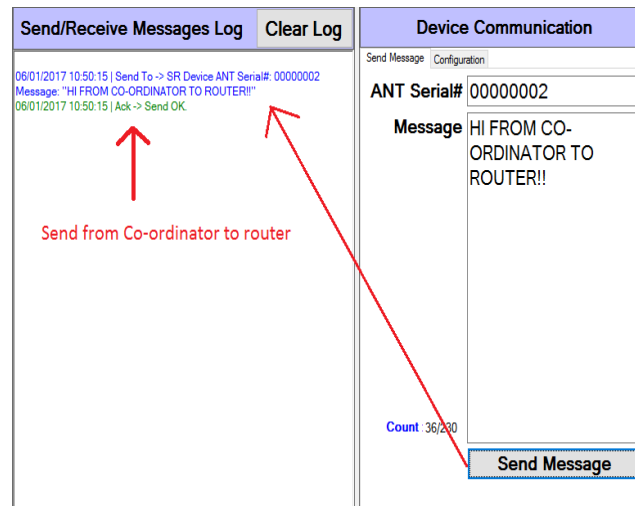
Figure 14: Message sent by SR Coordinator to SR Router.
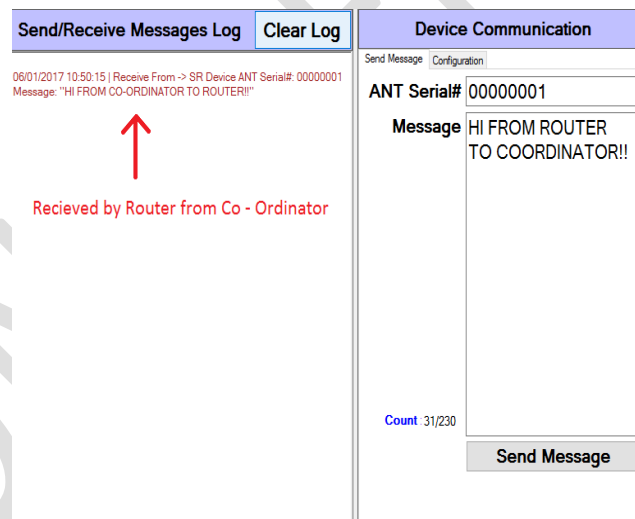
Figure 15: Message received by SR Router from SR Coordinator.

- Message from SR Router to SR Coordinator: Type ANT Serial number of SR Coordinator in SR Router's "Send Message" window to type any message and Click on "Send Message" and message will be received by SR Coordinator as shown below.

Figure 16: Message sent by SR Router to SR Coordinator.
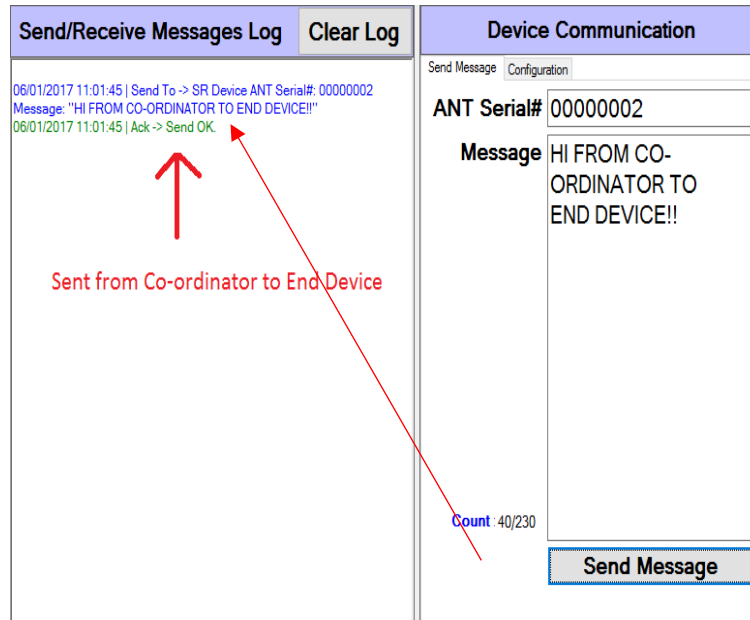
Figure 17: Message received by SR Coordinator from SR Router.

6.2 Communication between SR Coordinator and SR End Device:

- Message from SR Coordinator to SR End Device: Type ANT Serial number of SR End Device in SR Coordinator's "Send Message" window to type any message and Click on "Send Message" and message will be received by SR End Device as shown below.

Figure 18: Message sent by SR Coordinator to SR End Device.

Figure 19: Message received by SR End Device from SR Coordinator

- Message from SR End Device to SR Coordinator: Type ANT Serial number of SR Coordinator in SR End Device's "Send Message" window to type any message and Click on "Send Message" and message will be received by SR Coordinator as shown below.
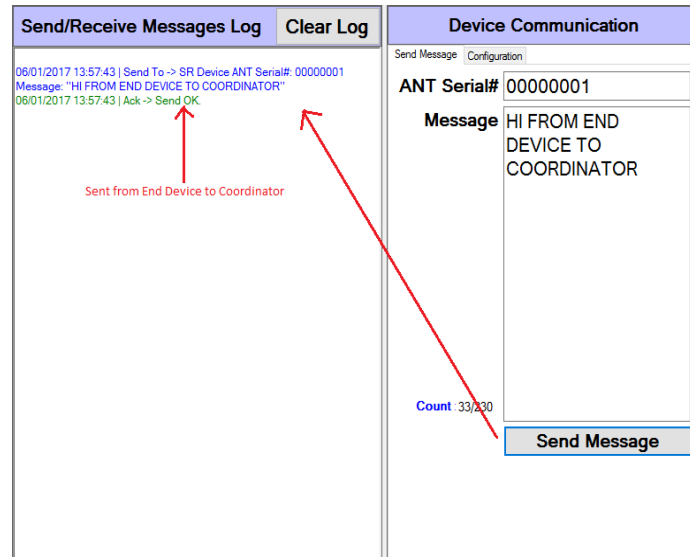
Figure 20: Message sent by SR End Device to SR Coordinator
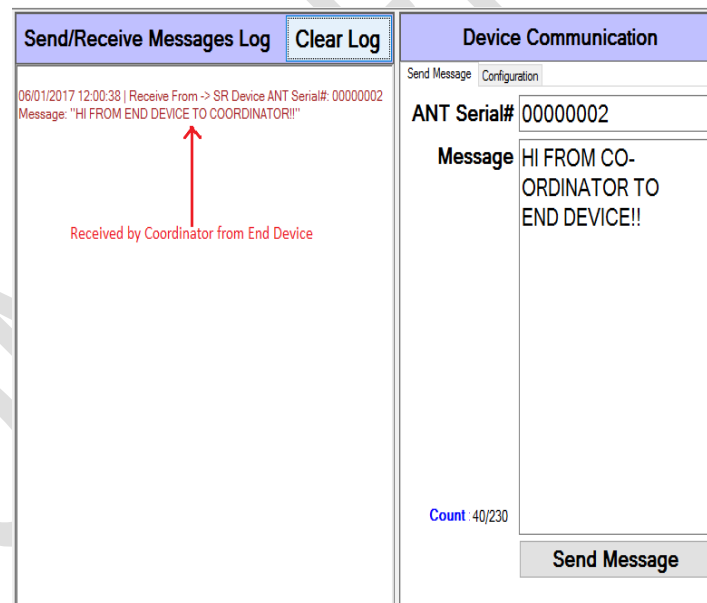
Figure 21: Message received by SR Coordinator from SR End Device

6.3 Communication between SR Router and SR End Device:

- Message from SR Router to SR End Device: Type ANT Serial number of SR End Device in SR Router's "Send Message" window to type any message and Click on "Send Message" and message will be received by SR End Device as shown below.
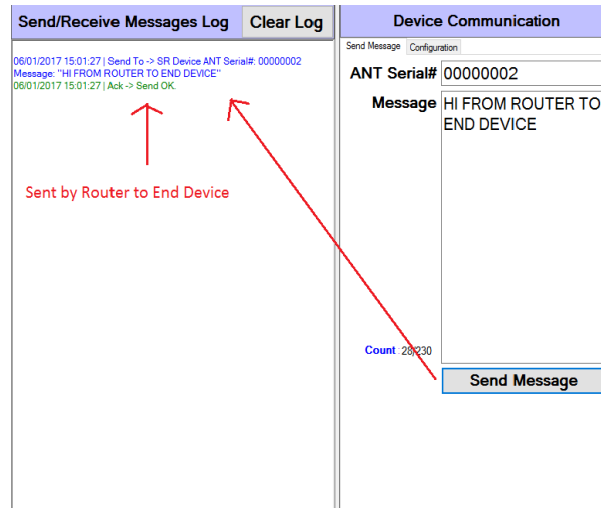
Figure 22: Message sent by SR Router to SR End Device
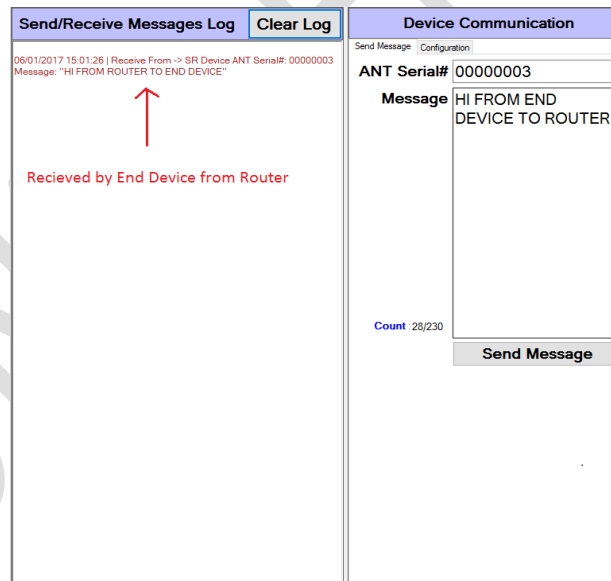
Figure 23: Message received by SR End Device from SR Router

- Message from SR End Device to SR Router: Type ANT Serial number of SR Router in SR End Device's "Send Message" window to type any message and Click on "Send Message" and message will be received by SR Router as shown below.
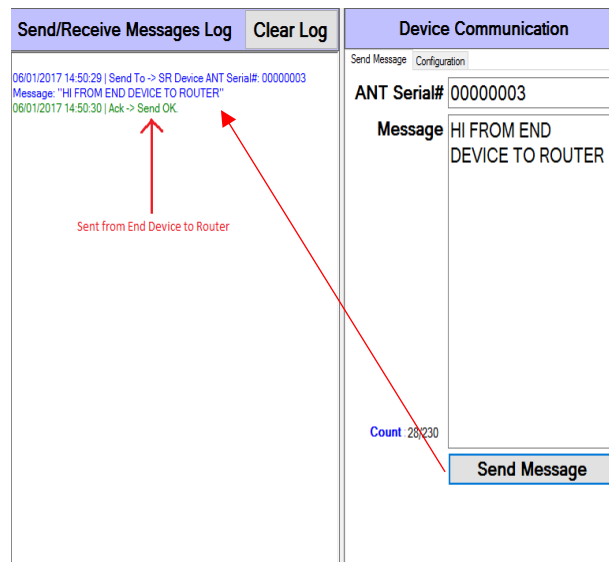

Figure 24: Message sent by SR End Device to SR Router
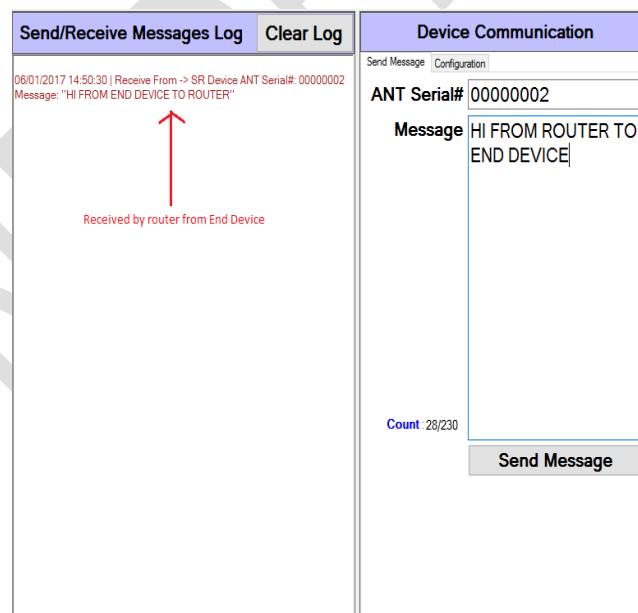
Figure 25: Message received by SR Router from SR End Device

7. Error Code List:

Sr. #	Error Code	Description
1	0(0x0000)	Successful command
2	1(0x0001)	SVC handler is missing
3	2(0x0002)	SoftDevice has not been enabled
4	3(0x0003)	Internal Error
5	4(0x0004)	No Memory for operation
6	5(0x0005)	Not found
7	6(0x0006)	Not supported
8	7(0x0007)	Invalid Parameter
9	8(0x0008)	Invalid state, operation disallowed in this state
10	9(0x0009)	Invalid Length
11	10(0x000A)	Invalid Flags
12	11(0x000B)	Invalid Data
13	12(0x000C)	Data size exceeds limit
14	13(0x000D)	Operation timed out
15	14(0x000E)	Null Pointer
16	15(0x000F)	Forbidden Operation
17	16(0x0010)	Bad Memory Address
18	17(0x0011)	Busy
19	18(0x0012)	Reserved
20	19(0x0013)	Reserved
21	20(0x0014)	Reserved
22	21(0x0015)	Reserved
23	22(0x0016)	Reserved
24	23(0x0017)	Reserved
25	24(0x0018)	Reserved
26	25(0x0019)	Reserved
27	26(0x001A)	Reserved
28	27(0x001B)	Reserved
29	28(0x001C)	Reserved
30	29(0x001D)	Reserved
31	30(0x001E)	Reserved
32	31(0x001F)	Reserved
33	32(0x0020)	Reserved
34	33(0x0021)	Reserved
35	34(0x0022)	Reserved
36	35(0x0023)	Reserved

37	36(0x0024)	Reserved
38	37(0x0025)	Reserved
39	38(0x0026)	Reserved
40	39(0x0027)	Reserved
41	40(0x0028)	Reserved
42	41(0x0029)	Reserved
43	42(0x002A)	Reserved
44	43(0x002B)	Reserved
45	44(0x002C)	Reserved
46	45(0x002D)	Reserved
47	46(0x002E)	Reserved
48	47(0x002F)	Reserved
49	48(0x0030)	Reserved
50	49(0x0031)	Reserved
51	4096(0x1000)	Unknown lfclk source
52	4097(0x1001)	Incorrect interrupt configuration (can be caused by using illegal priority levels, or having enabled SoftDevice interrupts)
53	4098(0x1002)	Incorrect CLENR0 (can be caused by erroneous SoftDevice flashing)
54	4099(0x1003)	Reserved
55	4500(0x1004)	Reserved
56	4501(0x1005)	Reserved
57	4502(0x1006)	Reserved
58	4503(0x1007)	Reserved
59	4504(0x1008)	Reserved
60	4505(0x1009)	Reserved
61	8192(0x2000)	Mutex already taken
62	8193(0x2001)	NVIC interrupt not available
63	8194(0x2002)	NVIC interrupt priority not allowed
64	8195(0x2003)	NVIC should not return
65	8196(0x2004)	Power mode unknown
66	8197(0x2005)	Power POF threshold unknown
67	8198(0x2006)	Power off should not return
68	8199(0x2007)	RAND not enough values
69	8200(0x2008)	Invalid PPI Channel
70	8201(0x2009)	Invalid PPI Group
71	8203(0x200A)	Reserved
72	8204(0x200B)	Reserved
73	8205(0x200C)	Reserved
74	8206(0x200D)	Reserved

75	8207(0x200E)	Reserved
76	8208(0x200F)	Reserved
78	8209(0x2010)	Reserved
79	8210(0x2011)	Reserved
80	8211(0x2012)	Reserved
81	12288(0x3000)	@ref ble enable has not been called.
82	12289(0x3001)	Invalid connection handle
83	12290(0x3002)	Invalid attribute handle
84	12291(0x3003)	Buffer capacity exceeded
85	12292(0x3004)	Invalid role
86	12293(0x3005)	Reserved
87	12294(0x3006)	Reserved
88	12295(0x3007)	Reserved
89	12296(0x3008)	Reserved
90	12297(0x3009)	Reserved
91	12298(0x300A)	Reserved
92	12299(0x300B)	Reserved
93	12300(0x300C)	Reserved
94	12301(0x300D)	Reserved
95	12302(0x300E)	Reserved
96	12304(0x300F)	Reserved
97	12305(0x3010)	Reserved
98	12306(0x3011)	Reserved
99	12307(0x3012)	Reserved
100	12308(0x3013)	Reserved
101	12800(0x3200)	UUID list does not contain an integral number of UUIDs
102	12801(0x3201)	Use of Whitelist not permitted with discoverable advertising
103	12802(0x3202)	The upper two bits of the address do not correspond to the specified address type
104	12803(0x3203)	Reserved
105	12804(0x3204)	Reserved
106	12805(0x3205)	Reserved
107	12806(0x3206)	Reserved
108	12807(0x3207)	Reserved
109	12808(0x3208)	Reserved
110	12809(0x3209)	Reserved
111	13056(0x3300)	Invalid attribute type
112	13057(0x3301)	System Attributes missing
113	13058(0x3302)	Reserved
114	13059(0x3303)	Reserved

115	13060(0x3304)	Reserved
116	13061(0x3305)	Reserved
117	13062(0x3306)	Reserved
118	13063(0x3307)	Reserved
119	13064(0x3308)	Reserved
120	13065(0x3309)	Reserved
121	40960(0xA000)	Wrong Command
122	40961(0xA001)	Feature is not implemented
123	40962(0xA002)	Command or Procedure failed due to timeout
124	40963(0xA003)	Authentication failed due to incorrect results in the authentication procedure. This could beÿdue to an incorrect Key or etc.
125	40964(0xA004)	Link supervision timeout has expired
126	40965(0xA005)	Characteristic can not supported read
127	40966(0xA006)	Characteristic can not supported write
128	40967(0xA007)	Characteristic can not supported write without response
129	40968(0xA008)	Characteristic can not supported notification
130	40969(0xA009)	Characteristic can not supported extended properties
131	40970(0xA00A)	Characteristic can not supported indication
132	40971(0xA00B)	Characteristic can not supported this Data length
133	40972(0xA00C)	Characteristic can not supported this characteristics propertiesÿ
134	40973(0xA00D)	The characteristicsÿvalue length is invalid for the operation
135	40974(0xA00E)	This Service not added
136	40975(0xA00F)	This Characteristics not added
137	40976(0xA010)	Notify Service not enable
138	40977(0xA011)	Indication service not enable
139	40978(0xA012)	Unknown UUID Type
140	40979(0xA013)	Characteristics data type mismatch
141	40980(0xA014)	Characteristics data type invalid
142	40981(0xA015)	This state AT&W Command not allowed(This command only run when BLE and ANT OFF)
143	40982(0xA016)	Reserved
145	40983(0xA017)	Reserved
146	40984(0xA018)	Reserved
147	40985(0xA019)	Reserved
148	40986(0xA01A)	Reserved
149	40987(0xA01B)	Reserved
150	40988(0xA01C)	Reserved
151	40989(0xA01D)	Reserved
152	40990(0xA01E)	Reserved

153	40991(0xA01F)	Reserved
154	40992(0xA020)	Reserved
155	40993(0xA021)	Reserved
156	40994(0xA022)	Reserved
157	40995(0xA023)	Reserved
158	40996(0xA024)	Reserved
159	40997(0xA025)	Reserved
160	40998(0xA026)	Reserved
161	40999(0xA027)	Reserved
162	40500(0xA028)	Reserved
163	40501(0xA029)	Reserved
164	40502(0xA02A)	Reserved
165	40503(0xA02B)	Reserved
166	40504(0xA02C)	Reserved
167	40505(0xA02D)	Reserved
168	40506(0xA02E)	Reserved
169	40507(0xA02F)	Reserved
170	40508(0xA030)	Reserved
171	40509(0xA031)	Reserved
172	40510(0xA032)	Reserved
173	40511(0xA033)	Reserved
174	40512(0xA034)	Reserved
175	40513(0xA035)	Reserved
178	40514(0xA036)	Reserved
179	40515(0xA037)	Reserved
180	40516(0xA038)	Reserved
181	40517(0xA039)	Reserved
182	40518(0xA03A)	Reserved
183	40519(0xA03B)	Reserved
184	40520(0xA03C)	Reserved
185	40521(0xA03D)	Reserved
186	40522(0xA03E)	Reserved
187	16405(0x4015)	Response on attempt to perform an action from the wrong channel state
188	16406(0x4016)	Response on attempt to communicate on a channel that is not open
189	16408(0x4018)	Response on attempt to open a channel without setting the channel ID
190	16409(0x4019)	Response when attempting to start scanning mode, when channels are still open
191	16415(0x401F)	Response on attempt to communicate on a channel with a TX transfer in progress

192	16416(0x4020)	Response when sequence number of burst message or burst data segment is out of order
193	16417(0x4021)	Response when transfer is busy and cannot process supplied burst message or burst data segment
194	16418(0x4022)	when transfer is busy and cannot process supplied burst message or burst data segment
195	16423(0x4027)	Response if a data message is provided that is too large
196	16424(0x4028)	Response when the message has an invalid parameter
197	16425(0x4029)	Response when an invalid network number is provided
198	16426(0x4030)	Response when the provided list ID or size exceeds the limit
199	16427(0x4031)	Response when attempting to transmit on channel 0 when in scan mode
200	16429(0x4033)	Response when an invalid parameter is specified in a configuration message
201	45056(0xB000)	No Failure - Success
202	45057(0xB001)	Hardware is not activated
203	45058(0xB002)	SR Device is not initialized
204	45059(0xB003)	Encryption failure due to serial number mismatch. Please contact support
205	45060(0xB004)	Encryption failure due to security token mismatch. Please contact support
206	45061(0xB005)	Encryption failure due to invalid operation request. Please contact support
207	45062(0xB006)	Operation timer expired. Please try again
208	45063(0xB007)	User is not found
209	45064(0xB008)	Number of users limit exceeds
210	45065(0xB009)	Operation fails due to low battery
211	45066(0xB00A)	Session Id mismatch
212	45067(0xB00B)	Invalid Command Id Request. Please contact support
213	45068(0xB00C)	Session Id not required
214	45069(0xB00D)	Unauthorized user is connected. Please contact support
215	45070(0xB00E)	SR Device is manually connected
216	45071(0xB00F)	Encryption failure due to time mismatch. Please contact support
217	45072(0xB010)	Length is mismatched in digital key
218	45073(0xB011)	Cannot communicate with SR device or SR device is out of range or SR device is power down
219	45074(0xB012)	SR Bridge failed to send data to SR device
220	45075(0xB013)	SR Bridge received invalid data from server
221	45076(0xB014)	SR device time out error (SR Bridge has not received response of requested message from SR device)
222	45077(0xB015)	SR Bridge failed to search SR devices
223	45078(0xB016)	Requested SR Device is already added in the SR Bridge. Please contact support
224	45079(0xB017)	Request was missing the serial # of the Bridge device

225	45080(0xB018)	The specified serial # of the Bridge device could not be found in the database
226	45081(0xB019)	The Bridge device is in the database but is not assigned to an account
227	45082(0xB01A)	Request was missing the serial # for a device to update
228	45083(0xB01B)	Incorrectly formatted JSON response
229	45084(0xB01C)	Cannot find the Instruction specified
230	45085(0xB01D)	Cannot find the Instruction specified
231	45086(0xB01E)	ANT Network is busy in performing other operation
232	45087(0xB01F)	SR Bridge is unable to communicate with ANT
233	45088(0xB020)	SR device failed to send data on ANT network
234	45089(0xB021)	SR device does not have valid network ID
235	45090(0xB022)	SR device is not in ANT network
236	45091(0xB023)	SR device communication error please try again
237	45092(0xB024)	SR Device received invalid data length
238	45093(0xB025)	User listing update error code will be send from device to phone when user ID sent from phone exceeds supported number of users in device
239	45107(0xB033)	Device is busy doing operation. Please try later
240	45108(0xB034)	SR Device is already locked
241	45109(0xB035)	SR Device is already unlocked
242	45110(0xB036)	Motion behind the door. Please press Unlock button to operate device
243	45111(0xB037)	operation error ? Door jammed
244	45112(0xB038)	Smart Button is disabled. To enable smart button go to Settings->SR Device Settings->Exterior Smart button->Enable
245	45113(0xB039)	Not in proximity range. Please press Unlock button to operate device
246	45114(0xB03A)	Wake up Switch Error. Please contact support
247	45115(0xB03B)	OPTO Error. Please contact support
248	45116(0xB03C)	SR Device is locked using smart button successfully
249	45117(0xB03D)	SR Device is unlocked using smart button successfully
250	45118(0xB03E)	Two consecutive online operation failed so please operate door in direct/local mode once to allow remote access
251	45119(0xB03F)	SR Device is already opened
252	45120(0xB040)	SR Device is already closed
253	45121(0xB041)	Sensor is not available

8. Contact us

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