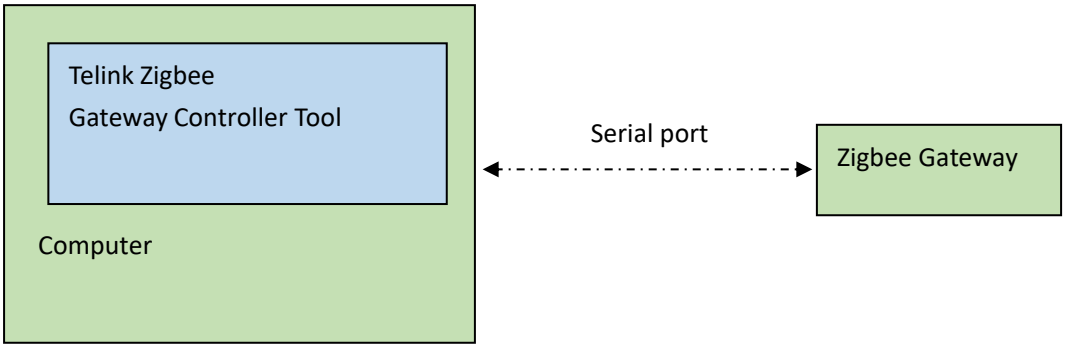
1. Brief

This document is the user manual for telink zigbee gateway controller tool, and note that only the generic step is shown here, please refer to “AN_19052900-E_Telink Zigbee SDK Developer Manual.pdf” for more information.

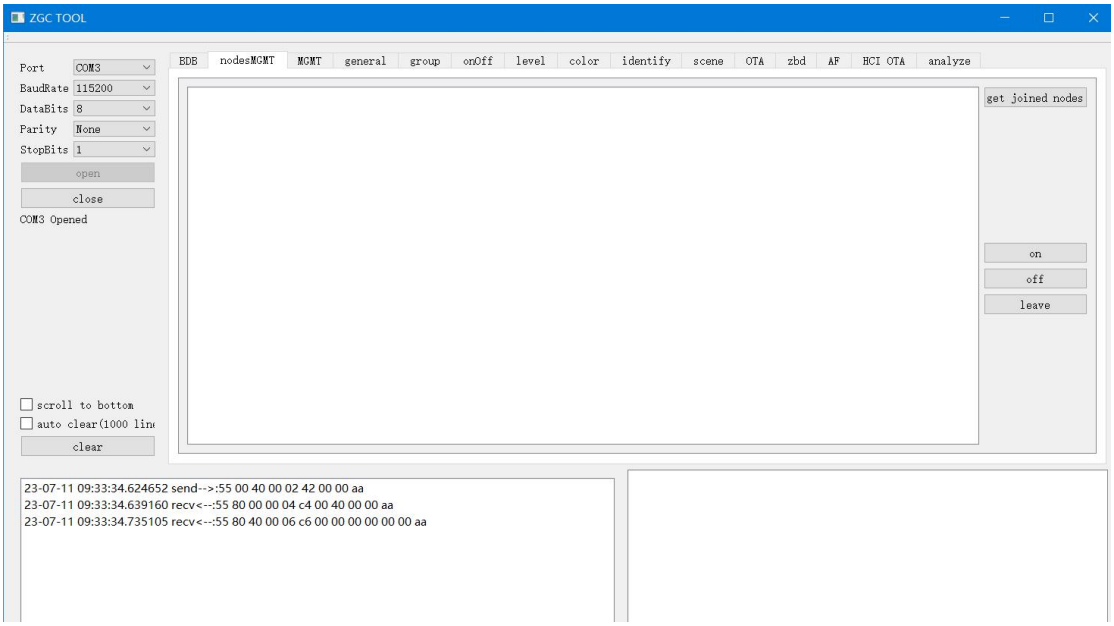
2. System Architecture



3. Step-by-Step Guide

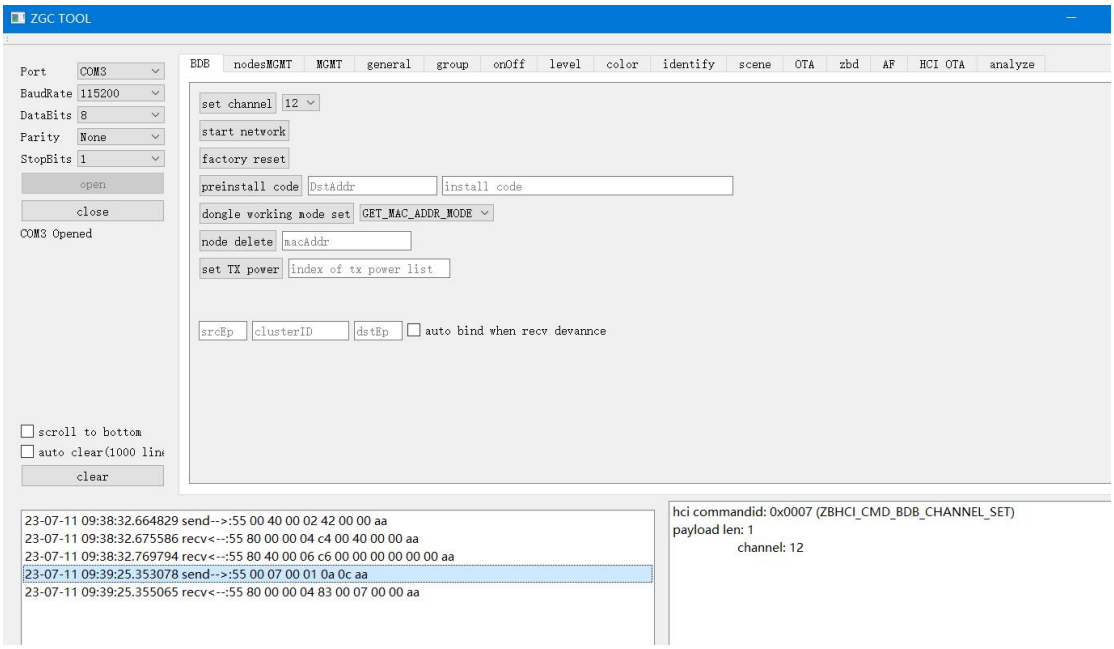
Step 1: Open the port

1) Select the port number, and other options can use the default value.
2) Click the “open” button and open the port.
3) When the port is opened, the tool sends a “get joined nodes” command automatically.



Step 2: Set the channel

1) Switch to the “BDB” page
2) Select a channel you want to use and click the “Set Channel” button.

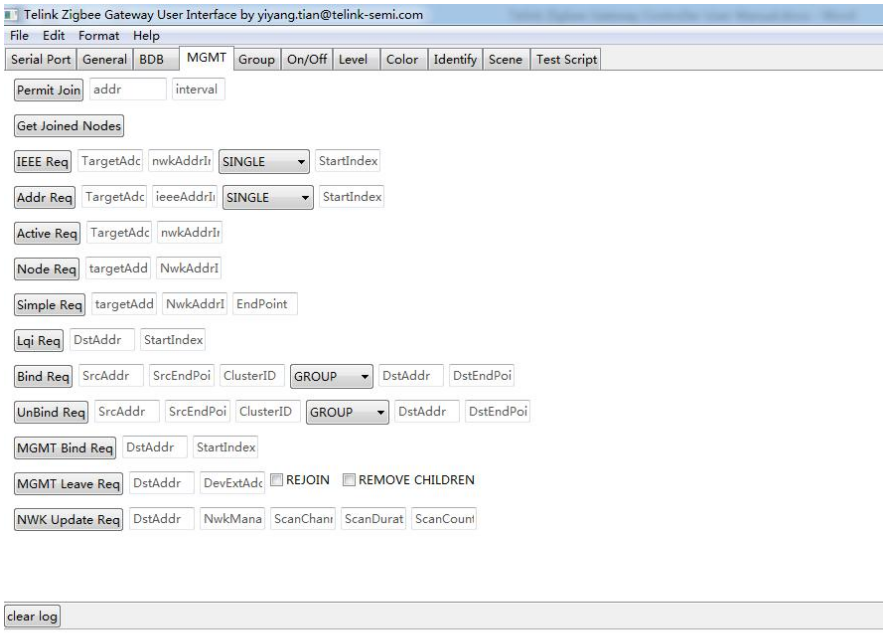


Step 3: Start the network

1) Click the “Start Network” button to start the network

Step 4: Set the permit join interval

1) Switch to the MGMT page
2) Fill the address and interval
3) Click the “Permit Join” button



Step 5: Power on the Zigbee device to join the network before the permit join interval expires, and then you can use other commands to control the device.

4. Auxiliary Function

1) AF Test

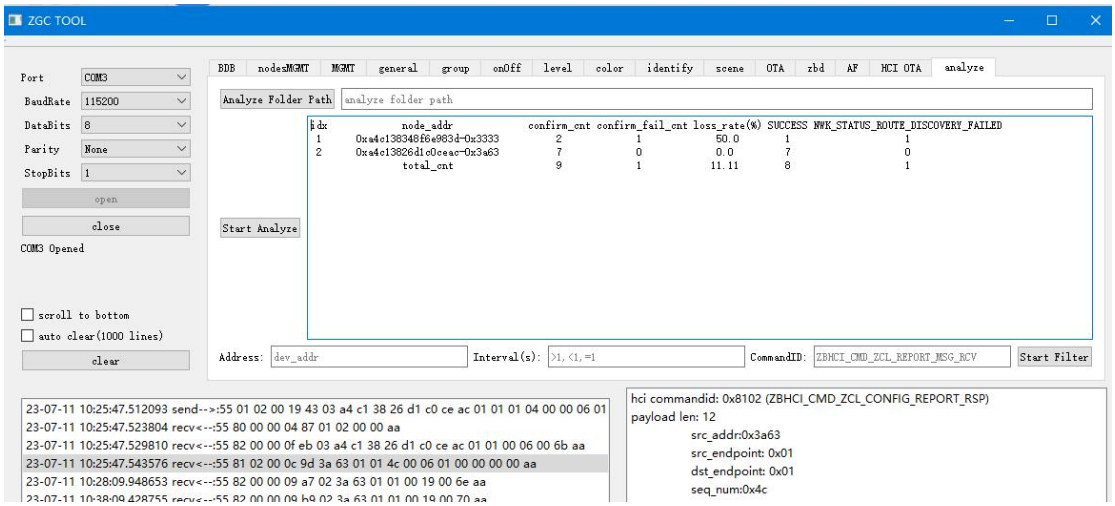
Generally, we use the AF command to test large networks. Switch to the “AF” page, choose the address mode, and fill the test interval.

If you choose broadcast mode, then the gateway will broadcast the toggle command at the setting interval. If you choose the unicast mode, the gateway will unicast ZCL on or off command to every node at the setting interval.

2) Analyse

Every time you open the tool, all the packets are saved in a folder, named with the current timestamp. The folder is in “userdata” folder which is under the installation directory.

If you want to analyse the loss rate of the nodes, you can switch to the “analyze” page. Then click the “Start Analyze” button.



Fill the folder path you want to analyse in the text box. If you want to parse the contents of the current folder, you may not fill the folder address. The packet loss rate of each node is measured based on the confirm packet feed back by the gateway. The packet loss reasons for each node are also listed below.

File content:

“all_packets.csv”: All the packets sent or received by the tool.

	A	B	C	D	E	F	G	H	I	J	K
1	Timestamp	TimeDelta	AddrMode	DevAddr	PacketInformation	CommandId	Status	Description			
2	23-07-10 16:50:40:212553	0			55 00 40 00 02 42 00 00 aa	ZBHCI_CMD_NODES_JOINED_GET_REQ		start_idx: 0x0			
3	23-07-10 16:50:40:226478	0.013925			55 80 00 00 04 c4 00 40 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x40 status:0x0(ZBHCI_MSG_S			
4	23-07-10 16:50:40:322050	0.095572			55 80 40 00 06 c6 00 00 00 00 00 00	ZBHCI_CMD_NODES_JOINED_GET_RSP	ZBHCI_MSG_STATUS_SUCCESS	total_cnt:0x0 start_idx:0x0 list_co			
5	23-07-10 16:51:20:254756	39.932706			55 00 07 00 01 0a 0c aa	ZBHCI_CMD_BDB_CHANNEL_SET		channel: 12			
6	23-07-10 16:51:20:261754	0.006998			55 80 00 00 04 83 00 07 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x7 status:0x0(ZBHCI_MSG_ST			
7	23-07-10 16:51:22:379168	2.117414			55 00 01 00 00 01 aa	ZBHCI_CMD_BDB_COMMISSION_FORMATION					
8	23-07-10 16:51:22:386550	0.007382			55 80 00 00 04 85 00 01 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x1 status:0x0(ZBHCI_MSG_ST			
9	23-07-10 16:51:43:227581	20.841031	0x02	0x3333	55 80 43 00 0b 6b 33 33 a4 c1 38 34	ZBHCI_CMD_NODES_DEV_ANNCE_IND		nwk_addr: 0x3333 ieee_addr:0xa4c138			
10	23-07-10 16:52:01:901992	18.674411	0x02	0xffff	55 00 34 00 04 31 ff ff 00 01 aa	ZBHCI_CMD_MGMT_PERMIT_JOIN_REQ		duration: 0x0 (s) tc_significance:			
11	23-07-10 16:52:01:911757	0.009765			55 80 00 00 04 b0 00 34 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x34 status:0x0(ZBHCI_MSG_S			
12	23-07-10 16:52:39:294040	37.382283			55 00 40 00 02 42 00 00 aa	ZBHCI_CMD_NODES_JOINED_GET_REQ		start_idx: 0x0			
13	23-07-10 16:52:39:301918	0.007878			55 80 00 00 04 c4 00 40 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x40 status:0x0(ZBHCI_MSG_S			
14	23-07-10 16:52:39:401549	0.099631			55 80 40 00 10 fd 00 01 00 00 01 00	ZBHCI_CMD_NODES_JOINED_GET_RSP	ZBHCI_MSG_STATUS_SUCCESS	total_cnt:0x1 start_idx:0x0 list_co			
15	23-07-10 16:53:32:651993	53.250444			55 00 40 00 02 42 00 00 aa	ZBHCI_CMD_NODES_JOINED_GET_REQ		start_idx: 0x0			
16	23-07-10 16:53:32:661069	0.009076			55 80 00 00 04 c4 00 40 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x40 status:0x0(ZBHCI_MSG_S			
17	23-07-10 16:53:32:761358	0.100289			55 80 40 00 10 fd 00 01 00 00 01 00	ZBHCI_CMD_NODES_JOINED_GET_RSP	ZBHCI_MSG_STATUS_SUCCESS	total_cnt:0x1 start_idx:0x0 list_co			
18	23-07-10 16:55:51:328992	138.56763	0x03	0xa4c138348f6e983d	55 00 20 00 15 4e a4 c1 38 34 8f 6e	ZBHCI_CMD_BINDING_REQ		src_addr: 0xa4c138348f6e983d src_ep			
19	23-07-10 16:56:57:156649	65.827657			55 00 40 00 02 42 00 00 aa	ZBHCI_CMD_NODES_JOINED_GET_REQ		start_idx: 0x0			
20	23-07-10 16:56:57:161869	0.00522			55 80 00 00 04 c4 00 40 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x40 status:0x0(ZBHCI_MSG_S			
21	23-07-10 16:56:57:265929	0.10406			55 80 40 00 10 fc 00 01 00 00 01 00	ZBHCI_CMD_NODES_JOINED_GET_RSP	ZBHCI_MSG_STATUS_SUCCESS	total_cnt:0x1 start_idx:0x0 list_co			
22	23-07-10 16:56:57:764556	0.498627	0x02	0xffff	55 00 10 00 0c 31 ff ff a4 c1 38 34	ZBHCI_CMD_DISCOVERY_NWK_ADDR_REQ		interest_addr: 0xa4c138348f6e983d s			
23	23-07-10 16:56:57:771331	0.006775			55 80 00 00 04 94 00 10 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x10 status:0x0(ZBHCI_MSG_S			
24	23-07-10 16:56:57:991411	0.22008	0x02	0x3333	55 80 10 00 0e b3 33 33 00 00 a4 c1	ZBHCI_CMD_DISCOVERY_NWK_ADDR_RSP	ZDO_SUCCESS	seq_num:0x0 status:0x0(ZDO_SUCCESS)			
25	23-07-10 16:57:00:287633	2.296222	0x03	0xa4c138348f6e983d	55 00 20 00 15 4e a4 c1 38 34 8f 6e	ZBHCI_CMD_BINDING_REQ		src_addr: 0xa4c138348f6e983d src_ep			
26	23-07-10 16:57:00:297620	0.009987			55 80 00 00 04 a4 00 20 00 00 aa	ZBHCI_CMD_ACKNOWLEDGE	ZBHCI_MSG_STATUS_SUCCESS	msgtype:0x20 status:0x0(ZBHCI_MSG_S			
27	23-07-10 16:57:00:327039	0.029419	0x02	0x3333	55 80 20 00 04 a5 33 33 01 00 aa	ZBHCI_CMD_BINDING_RSP	ZDO_SUCCESS	seq_num:0x1 status:0x0(ZDO_SUCCESS)			
28	23-07-10 16:57:00:336288	0.009249	0x02	0x3333	55 81 04 00 0c 1b 33 33 01 01 84 00	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x0			

“nodes_info.csv”: The information of the joined nodes.

	A	B	C	D	E	F	G
1	ieee_addr	nwk_addr	dev_type				
2	0xa4c138348f6e983d	0x3333	Router				
3	0xa4c13826d1c0ceac	0x3a63	Router				
4							
5							
6							
7							
8							

“all_packets_statistics.csv”: The analyse result.

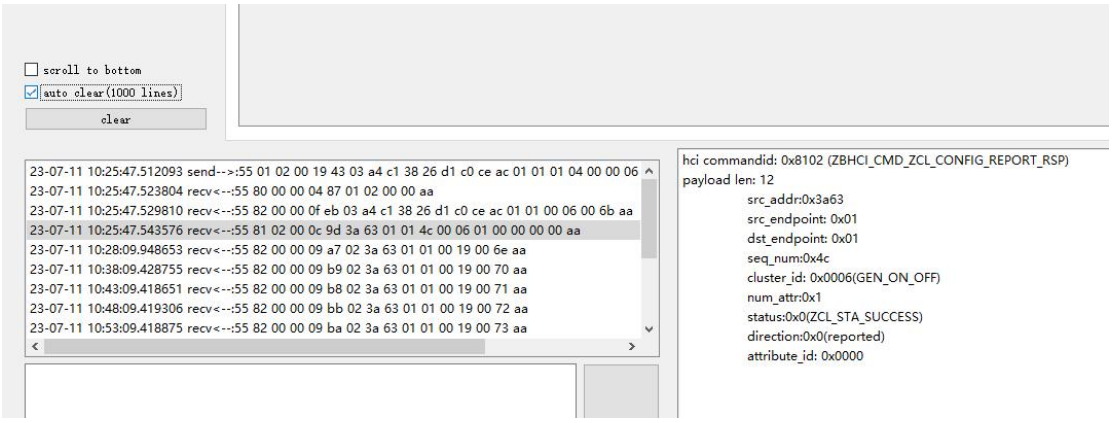
	A	B	C	D	E	F	G	H	I
1	idx	node_addr	confirm_cnt	confirm_fail_cnt	loss_rate(%)	SUCCESS	NWK_STATUS_ROUTE_DISCOVERY_FAILED		
2	1	0xa4c138348f6e983d-0x3333	2	1	50	1	1		
3	2	0xa4c13826d1c0ceac-0x3a63	7	0	0	7	0		
4		total_cnt	9	1	11.11	8	1		
5									
6									
7									
8									

“0xa4c138348f6e983d-0x3333.csv”: All the packets related to one specified node.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Timestamp	TimeDelta	AddrMode	DevAddr	PacketInformation	CommandId	Status	Description					
2	23-07-10 16:51:43:227581	0	0x02	0x3333	55 80 43 00 0b 6b 33 33 a4 c1	ZBHCI_CMD_NODES_DEV_ANNCE_IND		nwk_addr: 0x3333 ieee_addr:0xa4c138348f6e983d capability:0x8e					
3	23-07-10 16:55:51:328992	248.101411	0x03	0xa4c138348f6e983d	55 00 20 00 15 4e a4 c1 38 34	ZBHCI_CMD_BINDING_REQ		src_addr: 0xa4c138348f6e983d src_ep: 0x01 clister_id: 0x0006 ds					
4	23-07-10 16:56:57:991411	66.662419	0x02	0x3333	55 80 10 00 0e b3 33 33 00 00	ZBHCI_CMD_DISCOVERY_NWK_A	ZDO_SUCCESS	seq_num:0x0 status:0x0(ZDO_SUCCESS) ieee_addr: 0xa4c138348f6e9					
5	23-07-10 16:57:00:287633	2.296222	0x03	0xa4c138348f6e983d	55 00 20 00 15 4e a4 c1 38 34	ZBHCI_CMD_BINDING_REQ		src_addr: 0xa4c138348f6e983d src_ep: 0x01 clister_id: 0x0006 ds					
6	23-07-10 16:57:00:327039	0.039406	0x02	0x3333	55 80 20 00 04 a5 33 33 01 00	ZBHCI_CMD_BINDING_RSP	ZDO_SUCCESS	seq_num:0x1 status:0x0(ZDO_SUCCESS)					
7	23-07-10 16:57:00:336288	0.009249	0x02	0x3333	55 81 04 00 0c 1b 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x84 cluster_id: (					
8	23-07-10 16:57:13:332794	12.996506	0x02	0x3333	55 81 04 00 0c 1b 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x85 cluster_id: (					
9	23-07-10 16:57:20:326022	6.993228	0x02	0x3333	55 81 04 00 0c 19 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x86 cluster_id: (					
10	23-07-10 16:58:20:315842	59.98982	0x02	0x3333	55 81 04 00 0c 18 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x87 cluster_id: (					
11	23-07-10 16:59:20:327687	60.011845	0x02	0x3333	55 81 04 00 0c 17 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x88 cluster_id: (					
12	23-07-10 17:00:20:331326	60.003639	0x02	0x3333	55 81 04 00 0c 16 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x89 cluster_id: (					
13	23-07-10 17:01:20:326509	59.995183	0x02	0x3333	55 81 04 00 0c 15 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x8a cluster_id: (					
14	23-07-10 17:02:20:331232	60.004723	0x02	0x3333	55 81 04 00 0c 14 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x8b cluster_id: (					
15	23-07-10 17:03:20:341501	60.010269	0x02	0x3333	55 81 04 00 0c 13 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x8c cluster_id: (					
16	23-07-10 17:03:58:005825	37.664324	0x02	0x3333	55 01 00 00 0d 0e 02 33 33 01	ZBHCI_CMD_ZCL_ATTR_READ		dst_addr_mode: 0x2(short) dst_addr:0x3333 src_ep: 0x01 dst_ep:					
17	23-07-10 17:03:58:025708	0.019883	0x02	0x3333	55 82 00 00 09 de 02 33 33 01	ZBHCI_CMD_DATA_CONFIRM	SUCCESS	dstAddr_mode: 0x02(APS_SHORT_DSTADDR_WITHEP)dst_addr: 0x3333 s					
18	23-07-10 17:03:58:041781	0.016073	0x02	0x3333	55 81 00 00 13 01 33 33 01 01	ZBHCI_CMD_ZCL_ATTR_READ_R	ZCL_STA_SUCCESS	src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0xc3 cluster_id: (					
19	23-07-10 17:04:20:331086	22.289305	0x02	0x3333	55 81 04 00 0c 12 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x8d cluster_id: (					
20	23-07-10 17:05:20:346470	60.015384	0x02	0x3333	55 81 04 00 0c 11 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x8e cluster_id: (					
21	23-07-10 17:06:20:343276	59.996806	0x02	0x3333	55 81 04 00 0c 10 33 33 01 01	ZBHCI_CMD_ZCL_REPORT_MSG_RCV		src_endpoint: 0x01dst_endpoint: 0x01 seq_num:0x8f cluster_id: (					
22	23-07-11 10:23:11:067056	62210.72378	0x02	0x3333	55 01 00 00 0d 0e 02 33 33 01	ZBHCI_CMD_ZCL_ATTR_READ		dst_addr_mode: 0x2(short) dst_addr:0x3333 src_ep: 0x01 dst_ep:					
23	23-07-11 10:23:20:203363	9.136307	0x02	0x3333	55 82 00 00 09 3c 02 33 33 01	ZBHCI_CMD_DATA_CONFIRM	NWK_STATUS_ROUTE	dstAddr_mode: 0x02(APS_SHORT_DSTADDR_WITHEP)dst_addr: 0x3333 s					
24													

5. Notes

1). If you want to test the network for a long time, you had better to enable the “auto clear” to prevent the tool from becoming slow.



2). The “HCI OTA” is used to download the OTA file of the other devices. The gateway will save the file in its flash. Then upgrade the other devices through Zigbee OTA messages.