WizFi360

Application – Throughput

Version 1.2

WIZnet Co.,Ltd

Copyright© 2019

History

Ver	Date	Description
1.0	Aug.2019	Initial version
1.1	Sep.2019	Add command mode throughput test result
1.2	Oct.2019	Modify contents about command mode

Contents

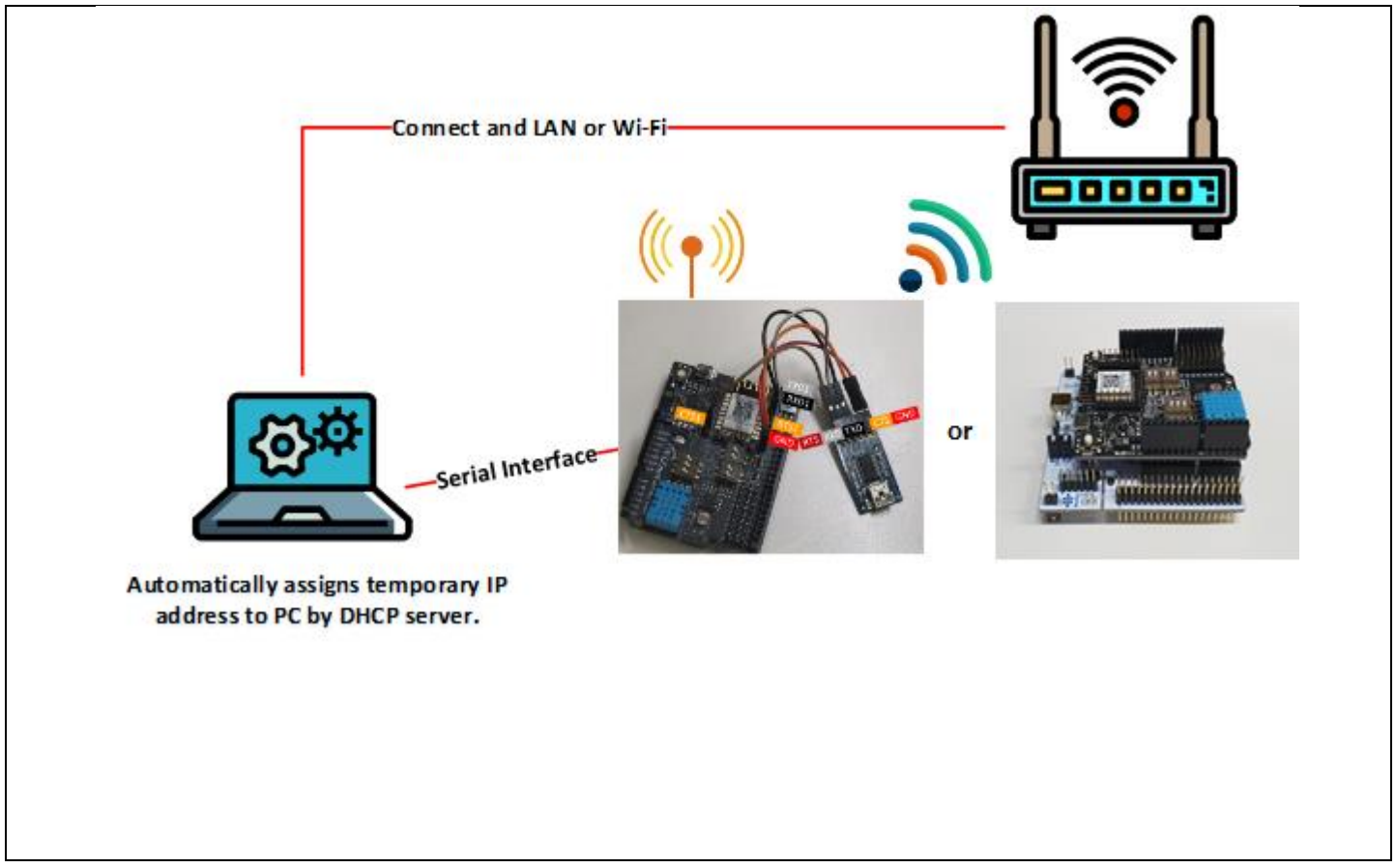
1. Test environment

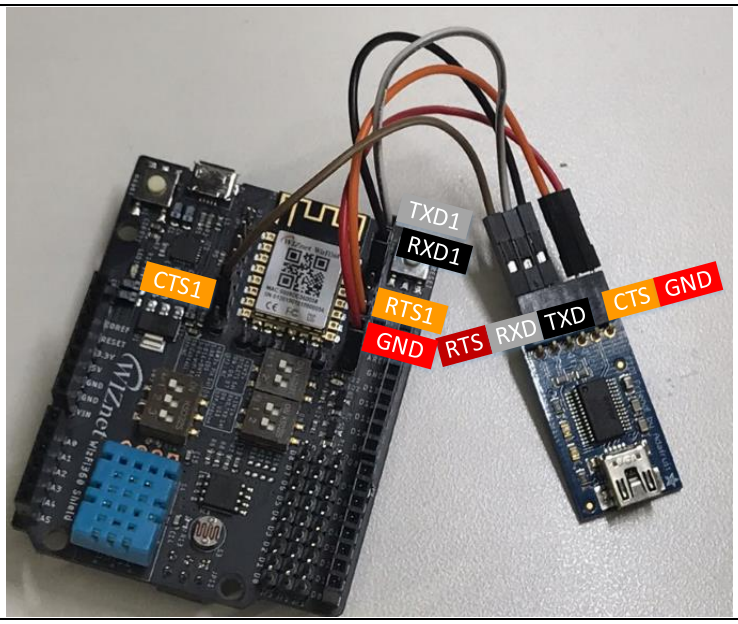
UART Throughput Test 를 하기 위해서는 CTS/RTS 를 이용한 제어 및 WizFi360 제어 Software 가 필요하다.

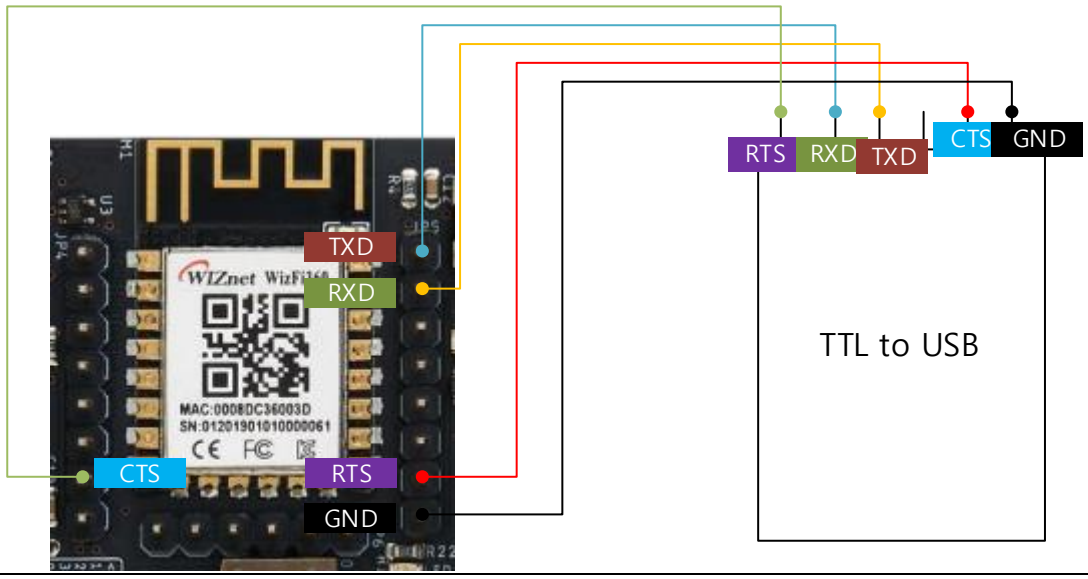
- WizFi360 EVB or WizFi360io
- STM32Fxxx EVB(NUCLEO-F401RE)
- PC
- Serial Tool
  - YAT Serial Tool(Data Mode)
- WizFi360 제어 Software(Command Mode)
- 1Mbyte data file
- WiFi Router(SoftAP mode 를 사용할 경우 제외)

Data Mode 일 경우에는 YAT Serial Tool 를 이용하여 RTS/CTS 를 설정하고, DTR 로 Data Read 신호 설정해준다. 그런 후 RTS/CTS 가 제어하면서 데이터 전송이 이루어진다.

Command Mode 일 경우에는 AT+CIPSENDBUF command 를 이용하여 한번에 최대 보낼 수 있는 데이터 Byte 수인 2048 을 설정한 후 2048 Byte 크기의 Data 를 보내고, 또다시 AT+CIPSENDBUF 와 데이터를 반복해가면서 데이터 전송이 이루어진다.




TXD1
RXD1
CTS1
RTS1
GND
RTS
RXD
TXD
CTS
GND


TXD
RXD
CTS
RTS
GND
RTS
RXD
TXD
CTS
GND
TTL to USB

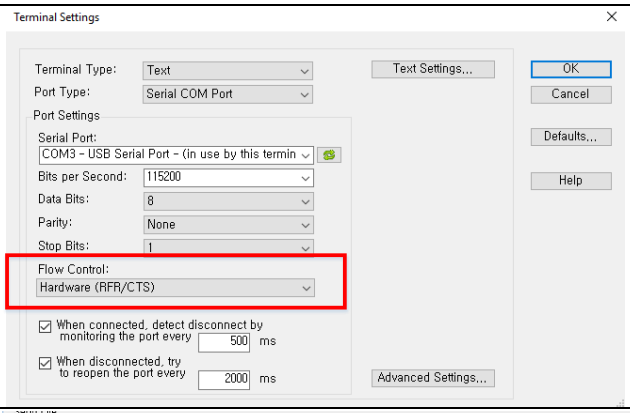
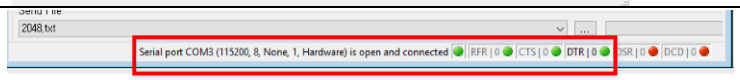
2. Using Serial command

- **Station Mode**

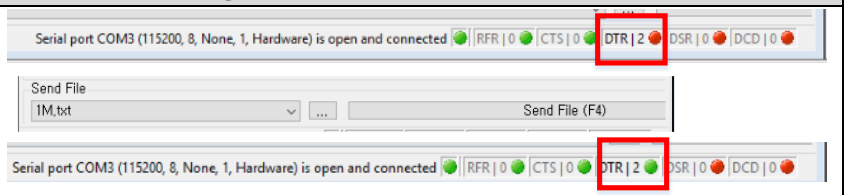
AT command	Terminal
AT AT+CWMODE_CUR=1 AT+CWDHCP_CUR=1,1 AT+CWLAP AT+CWJAP_CUR=”wizms1”,”maker0701” AT+CIPSTA_CUR?	AT<CR><LF> <CR><LF> OK<CR><LF> AT+CWMODE_CUR=1<CR><LF> <CR><LF> OK<CR><LF> AT+CWDHCP_CUR=1,1<CR><LF> <CR><LF> OK<CR><LF> AT+CWLAP<CR><LF> +CWLAP:(4,"DIR-815_Wiznet",-59,"[redacted]",1)<CR><LF> +CWLAP:(0,"ESP_574935",-71,"[redacted]",1)<CR><LF> +CWLAP:(3,"##WIZnet_irina",-46,"[redacted]",1)<CR><LF> +CWLAP:(3,"Matthew2.4",-63,"[redacted]",2)<CR><LF> +CWLAP:(3,"rena",-46,"[redacted]",3)<CR><LF> +CWLAP:(0,"iptime",-67,"[redacted]",4)<CR><LF> +CWLAP:(3,"Dap",-63,"[redacted]",5)<CR><LF> +CWLAP:(0,"ESP_577CC7",-67,"[redacted]",6)<CR><LF> +CWLAP:(3,"wizms1",-63,"[redacted]",6)<CR><LF> +CWLAP:(0,"Wizfi360",-69,"[redacted]",6)<CR><LF> +CWLAP:(4,"DLINK-IPv6",-55,"[redacted]",10)<CR><LF> +CWLAP:(0,"iptime",-59,"[redacted]",11)<CR><LF> +CWLAP:(3,"WIZnet_Scott",-51,"[redacted]",11)<CR><LF> +CWLAP:(0,"WizFi360_A1B2D1",-69,"[redacted]",11)<CR><LF> +CWLAP:(3,"Teddy_AP",-57,"[redacted]",13)<CR><LF> <CR><LF> OK<CR><LF> AT+CWJAP_CUR="wizms1","maker0701"<CR><LF> WIFI DISCONNECT<CR><LF> WIFI CONNECTED<CR><LF> WIFI GOT IP<CR><LF> <CR><LF> OK<CR><LF> AT+CIPSTA_CUR?<CR><LF> +CIPSTA_CUR:ip:"192.168.1.120"<CR><LF> +CIPSTA_CUR:gateway:"192.168.1.1"<CR><LF> +CIPSTA_CUR:netmask:"255.255.255.0"<CR><LF> <CR><LF> OK<CR><LF>

- **UART CTS/RTS Setting**

AT command	Terminal
AT+CWUART_CUR = 115200,8,1,0,1	AT+UART_CUR=115200,8,1,0,1<CR><LF> <CR><LF> OK<CR><LF>
Terminal Setting	

1. Ctrl+Shift+S > Open the Settings 2. Flow Control안에 Hardware(RFR/CTS)로 변경	
3. Terminal창 아래에 오면 CTS/DTR이 초록으로 들어온 것을 확인할 수 있다.	

- **TCP Client /Data mode**

AT command	Terminal
AT+CIPSTART="TCP","192.168.100.27",5001 AT+CIPMODE=1 AT+CIPSEND	AT+CIPSTART="TCP","192.168.100.27",5001<CR><LF> CONNECT<CR><LF> <CR><LF> OK<CR><LF> AT+CIPMODE=1<CR><LF> <CR><LF> OK<CR><LF> AT+CIPSEND<CR><LF> <CR><LF> >
Terminal Setting	
1. DTR이 빨간불일 때, 1M.txt를 보내고, 2. DTR를 클릭해서 초록불로 바뀌면 데이터가 Serial을 통해 전송되게 된다.	

- **TCP Client / Command mode**

AT command	Example Code

AT+CIPSTART="TCP","192.168.100.27",5001
AT+CIPMODE=0
AT+CIPSENDBUF=2048
Send the 2048byte data * 512times = 1Mbyte
	int8_t deviceTestThroughput_WizFi360(char *data, int len)
	{
	int8_t ret = RET_NOK;
	int cnt;
	int segid = 0;
	for(cnt = 0; cnt < (len / 4); cnt++) // 2k * 512 = 1M
	{
	if(ATCmdParser_send("AT+CIPSENDBUF=%d", len)&& ATCmdParser_recv("OK") && ATCmdParser_recv(">"))
	{
	if(ATCmdParser_send("%s", data) && ATCmdParser_recv("%d,SEND OK", &segid))
	{
	ret = RET_OK;
	}
	else
	{
	printf("Write data : failed\r\n");
	}
	}
	else
	{
	printf("Set buffer : failed\r\n");
	}
	}
	return ret;
	}

3. The result of UART Throughput

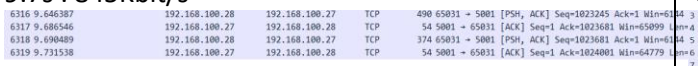
1Mbyte를 PC 혹은 WizFi360을 제어하는 MCU에서 WizFi360의 Serial(UART1)로 데이터를 보내고, TCP Server로 데이터를 전송한다.

Baud rate	Data mode		Command mode	
	Time	Speed(bit/s)	Time	Speed(bit/s)
115200	123s	66K	93.9s	87.2K
921600	16.3s	502K	14.0s	585.1K
1000000	14.9s	550K	13.0s	630.2K
1250000	12.7s	645K	11.0s	744.7K
1500000	10.5s	780K	10.0s	819.2K
2000000	9.7s	845K	8.0s	1.0M

해당 속도는 Wireshark를 이용하여, 데이터 전송시작부터 완료되는 시점까지의 시간을 측정한 것은 Appendix 1을 보면 된다.

Appendix 1

Baud rate	Data mode	Command mode
115200	123s : 66Kbit/s	93.9s : 87.2Kbit/s
921600	16.3s :502Kbit/s	14.0s : 585.1Kbit/s
1000000	14.9s : 550Kbit/s	13.0s : 630.2Kbit/s
1250000	12.7s : 645Kbit/s	11.0s : 744.7Kbit/s
1500000	10.5s : 780Kbit/s	10.0s : 819.2Kbit/s

2000000	9.7s : 845Kbit/s 	8.0s : 1.0Mbit/s