WizFi360

Application – Throughput

Version 1.0

WIZnet Co.,Ltd

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History

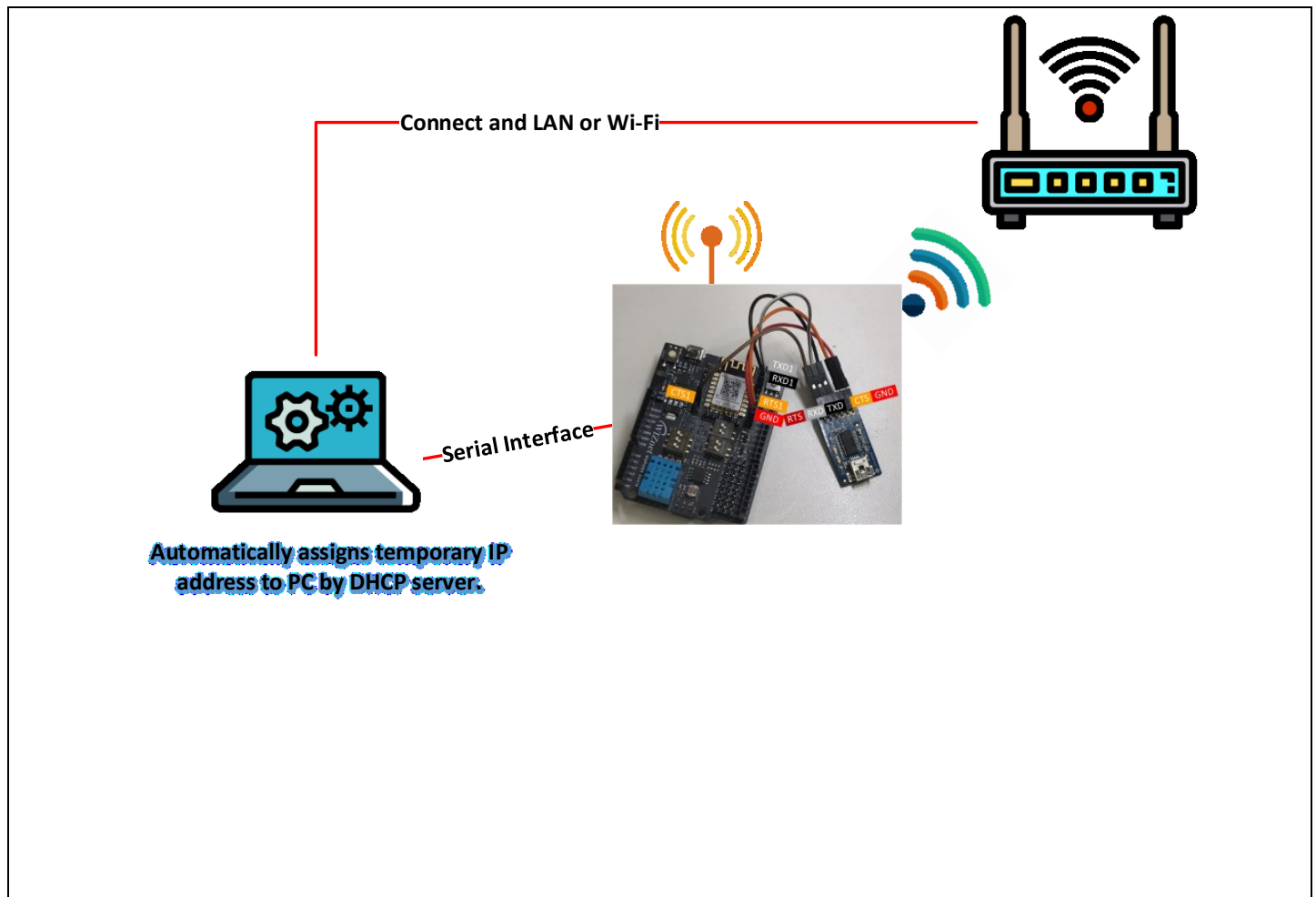| Ver	Date	Description
1.0	Aug.2019	Initial version

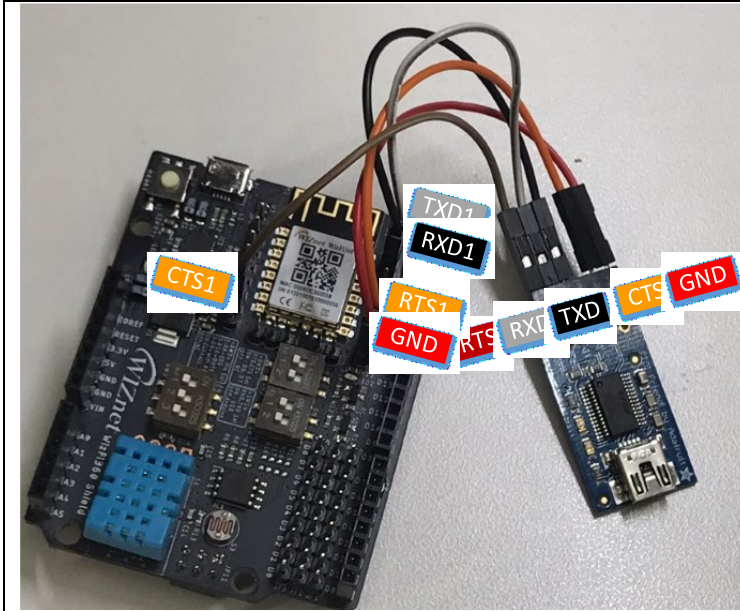# Contents

1. Test environment

UART Throughput Test 를 하기 위해서는 CTS/RTS 를 이용한 제어가 필요하다.

- WizFi360 EVB or WizFi360io
- PC
- Serial Tool
  - o YAT Serial Tool(Data Mode)
  - o Python(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 데이터인
2048 을 설정한 후 Data 2048 를 보내고, 또다시 AT+CIPSENDBUF 와 데이터를 반복해가면서 데이터 전송이
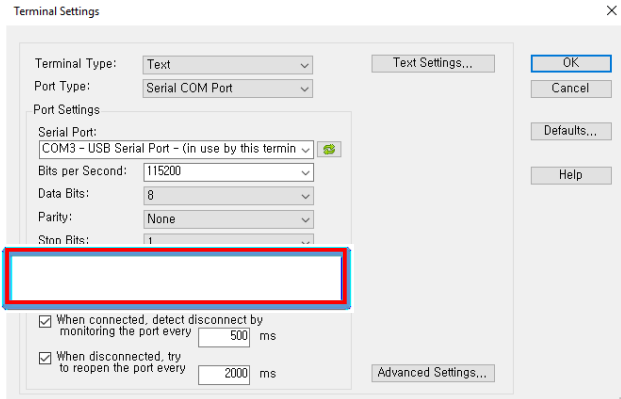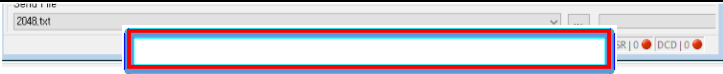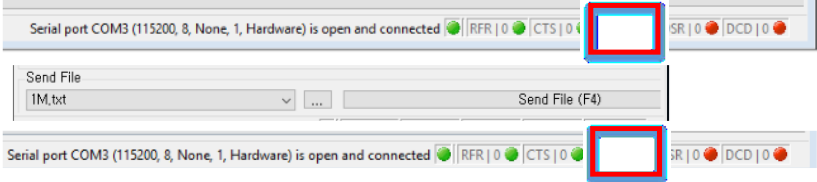이루어진다.

회로도 추가

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,"_____",1)<CR><LF>`
	`+CWLAP:(0,"ESP_574935",-71,"_____",1)<CR><LF>`
	`+CWLAP:(3,"##WIZnet_irina",-46,"_____",1)<CR><LF>`
	`+CWLAP:(3,"Matthew2.4",-63,"_____",2)<CR><LF>`
	`+CWLAP:(3,"rena",-46,"_____",3)<CR><LF>`
	`+CWLAP:(0,"iptime",-67,"_____",4)<CR><LF>`
	`+CWLAP:(3,"Dap",-63,"_____",5)<CR><LF>`
	`+CWLAP:(0,"ESP_577CC7",-67,"_____",6)<CR><LF>`
	`+CWLAP:(3,"wizms1",-63,"_____",6)<CR><LF>`
	`+CWLAP:(0,"Wizfi360",-69,"_____",6)<CR><LF>`
	`+CWLAP:(4,"DLINK-IPv6",-55,"_____",10)<CR><LF>`
	`+CWLAP:(0,"iptime",-59,"_____",11)<CR><LF>`
	`+CWLAP:(3,"WIZnet_Scott",-51,"_____",11)<CR><LF>`
	`+CWLAP:(0,"WizFi360_A1B2D1",-69,"_____",11)<CR><LF>`
	`+CWLAP:(3,"Teddy_AP",-57,"_____",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 Setiings** 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	Terminal

AT+CIPSTART="TCP","192.168.100.27",5001	AT+CIPSTART="TCP","192.168.100.27",5001<CR><LF> CONNECT<CR><LF> <CR><LF> OK<CR><LF>
AT+CIPMODE=0	AT+CIPMODE=0<CR><LF> AT+CIPMODE=0<CR><LF> <CR><LF> OK<CR><LF>
AT+CIPSENDBUF=2048	AT+CIPSENDBUF=2048<CR><LF> AT+CIPSENDBUF=2048<CR><LF> 1,0<CR><LF> <CR><LF> OK<CR><LF> >
Send the 1Mbyte.txt	

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3. The result of UART Throughput

1Mbyte를 PC에서 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		
921600	16.3s	502K		
1000000	14.9s	550K		
1250000	12.7s	645K		
1500000	10.5s	780K		
2000000	9.7s	845K		

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

Appendix 1

Baud rate	Data mode	Command mode
115200	123s : 66Kbit/s 	
921600	16.3s :502Kbit/s 	
1000000	14.9s : 550Kbit/s 	
1250000	12.7s : 645Kbit/s 	

1500000	10.5s : 780Kbit/s	
	2242 10.389973 192.168.100.28 192.168.100.27 TCP 490 65021 → 5001 [PSH, ACK] Seq=1023074 Ack=1 Win=6144 Len=436 [TCP 2244 10.430942 192.168.100.27 192.168.100.28 TCP 54 5001 → 65021 [ACK] Seq=1 Ack=1023510 Win=65099 Len=0 2245 10.445897 192.168.100.28 192.168.100.27 TCP 545 65021 → 5001 [PSH, ACK] Seq=1023510 Ack=1 Win=6144 Len=491 [TCP 2247 10.486915 192.168.100.27 192.168.100.28 TCP 54 5001 → 65021 [ACK] Seq=1 Ack=1024001 Win=64608 Len=0	
2000000	9.7s : 845Kbit/s	
	6316 9.646387 192.168.100.28 192.168.100.27 TCP 490 65031 → 5001 [PSH, ACK] Seq=1023245 Ack=1 Win=6144 Len=436 6317 9.686546 192.168.100.27 192.168.100.28 TCP 54 5001 → 65031 [ACK] Seq=1 Ack=1023681 Win=65099 Len=0 6318 9.690489 192.168.100.28 192.168.100.27 TCP 374 65031 → 5001 [PSH, ACK] Seq=1023681 Ack=1 Win=6144 Len=320 6319 9.731538 192.168.100.27 192.168.100.28 TCP 54 5001 → 65031 [ACK] Seq=1 Ack=1024001 Win=64779 Len=0	