WiFi

2017 Feb 26

I'm going to study experiments because I bought ESP-WROOM-02 module.
ESP-WROOM-02 module is wireless LAN communication module.
(including ESP8266,Xtal,flashmemory,TCP/IPprotocol stack and Atcommand API).
It need external 3.3V-PowerSupply because ESP-WROOM-02 module temporaly use
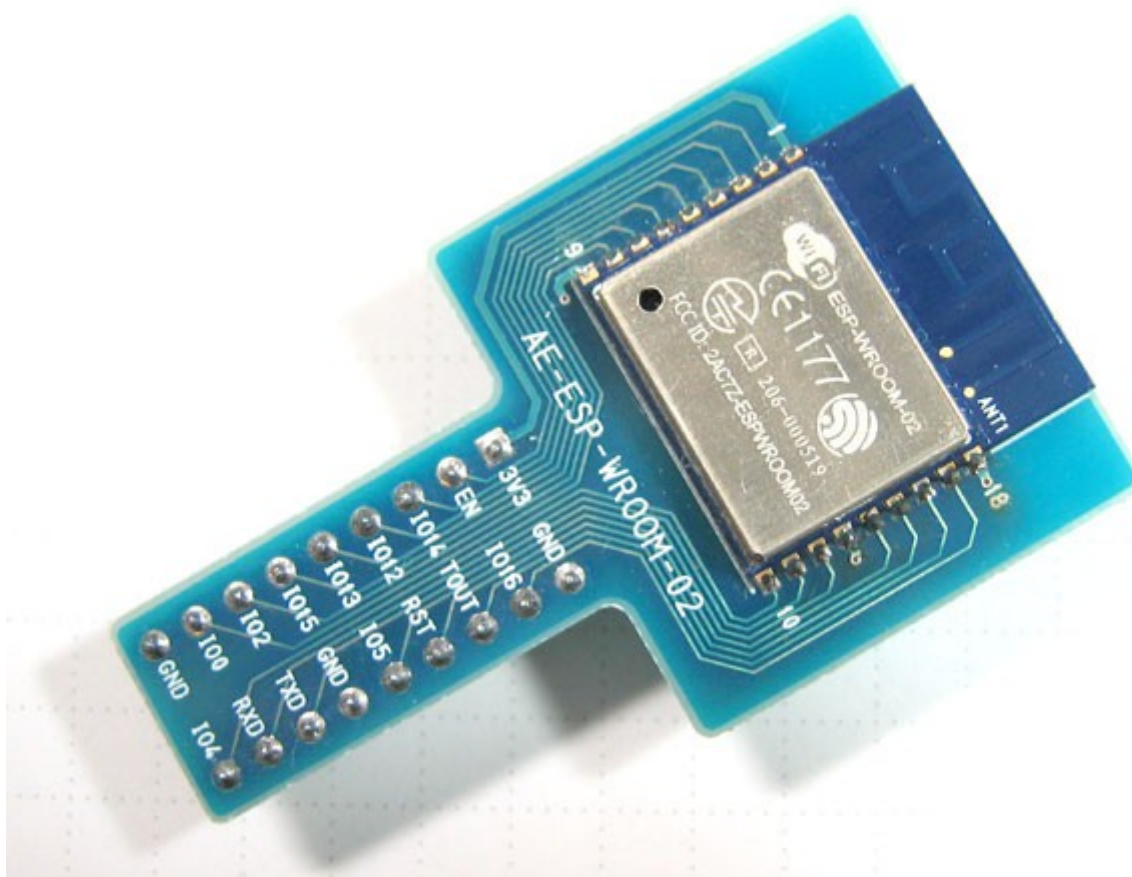500mA.

It use Flash-Boot-Mode(UART default:115200baud).
GPIO15:Lo
GPIO0:Hi
GPIO2:Hi
EN:Hi

Please put your WirelessLAN's SSID and password in Forth-code.

BootUp message   BootUp.f   2017 Feb 17

When booting up ESP-WROOM-02, it send message at 74880baud.
Last some characters are send at 115200baud.
String is 'Ready'.

```
Prop0 Cog6 ok
initialMsg
394 characters

17_880 00_394:
17_880: 255 013 010 032 101 116 115 032 074 097 110 032 032 056 032 050    ... ets Jan  8 2
17_896: 048 049 051 044 114 115 116 032 099 097 117 115 101 058 049 044    013,rst cause:1,
17_912: 032 098 111 111 116 032 109 111 100 101 058 040 051 044 055 041     boot mode:(3,7)
17_928: 013 010 013 010 108 111 097 100 032 048 120 052 048 049 048 048    ....load 0x40100
17_944: 048 048 048 044 032 108 101 110 032 049 051 057 054 044 032 114    000, len 1396, r
17_960: 111 111 109 032 049 054 032 013 010 116 097 105 108 032 052 013    oom 16 ..tail 4.
17_976: 010 099 104 107 115 117 109 032 048 120 056 057 013 010 108 111    .chksum 0x89..lo
17_992: 097 100 032 048 120 051 102 102 101 056 048 048 048 044 032 108    ad 0x3ffe8000, l
18_008: 101 110 032 055 055 054 044 032 114 111 111 109 032 052 032 013    en 776, room 4 .
18_024: 010 116 097 105 108 032 052 013 010 099 104 107 115 117 109 032    .tail 4..chksum
18_040: 048 120 101 056 013 010 108 111 097 100 032 048 120 051 102 102    0xe8..load 0x3ff
18_056: 101 056 051 048 056 044 032 108 101 110 032 053 052 048 044 032    e8308, len 540,
18_072: 114 111 111 109 032 052 032 013 010 116 097 105 108 032 056 013    room 4 ..tail 8.
18_088: 010 099 104 107 115 117 109 032 048 120 099 048 013 010 099 115    .chksum 0xc0..cs
18_104: 117 109 032 048 120 099 048 013 010 013 010 050 110 100 032 098    um 0xc0....2nd b
18_120: 111 111 116 032 118 101 114 115 105 111 110 032 058 032 049 046    oot version : 1.
18_136: 052 040 098 049 041 013 010 032 032 083 080 073 032 083 112 101    4(b1)..  SPI Spe
18_152: 101 100 032 032 032 032 032 032 058 032 052 048 077 072 122 013    ed      : 40MHz.
18_168: 010 032 032 083 080 073 032 077 111 100 101 032 032 032 032 032    .  SPI Mode
18_184: 032 032 058 032 081 073 079 013 010 032 032 083 080 073 032 070     : QIO..  SPI F
18_200: 108 097 115 104 032 083 105 122 101 032 038 032 077 097 112 058    lash Size & Map:
18_216: 032 056 077 098 105 116 040 053 049 050 075 066 043 053 049 050     8Mbit(512KB+512
18_232: 075 066 041 013 010 106 117 109 112 032 116 111 032 114 117 110    KB)..jump to run
18_248: 032 117 115 101 114 049 032 064 032 049 048 048 048 013 010 013     user1 @ 1000...
18_264: 010 013 010 083 068 203 163 192 152 032 032 032 032 032 032 032    ...SD....
ÿ

 ets Jan  8 2013,rst cause:1, boot mode:(3,7)


load 0x40100000, len 1396, room 16

tail 4

chksum 0x89

load 0x3ffe8000, len 776, room 4

tail 4

chksum 0xe8

load 0x3ffe8308, len 540, room 4

tail 8

chksum 0xc0

csum 0xc0


2nd boot version : 1.4(b1)

  SPI Speed      : 40MHz

  SPI Mode       : QIO
```

```
 SPI Flash Size & Map: 8Mbit(512KB+512KB)

jump to run user1 @ 1000



SD?# Prop0 Cog6 ok       ← Maybe SD? = Ready

CON:Prop0 Cog5 RESET - last status: 0 ok
```

Telnet   telnet_0.1.f   2017 Feb 14
Operated ESP-WROOM-02 as telnet-server.
TeraTerm operate as telnet-client on Windows8.1(inside same network)
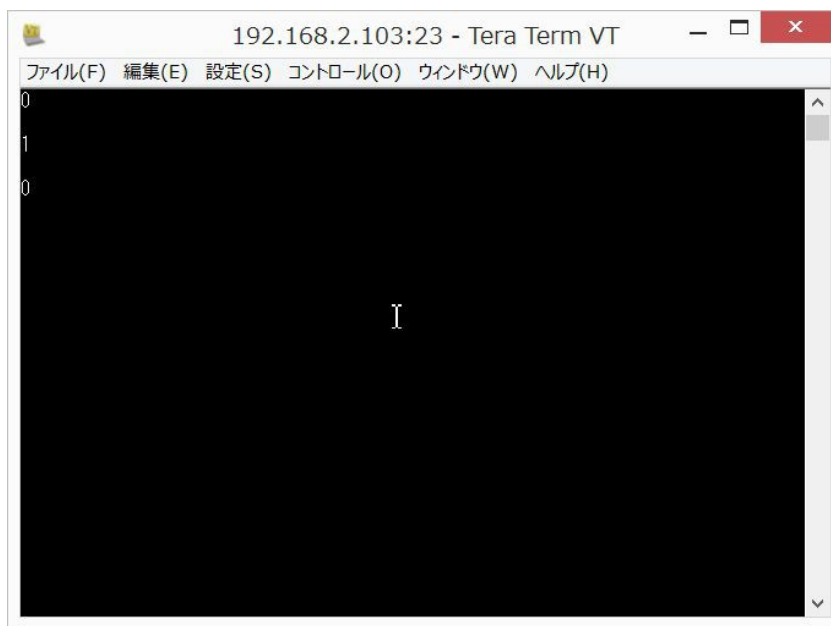
Host:192.168.2.103
Port:23

Checked local-echo on terminal menu.

LED is on when 1 entered.
LED is off when 0 entered.

LED connected to P3 is on when sent 1 from telnet client.
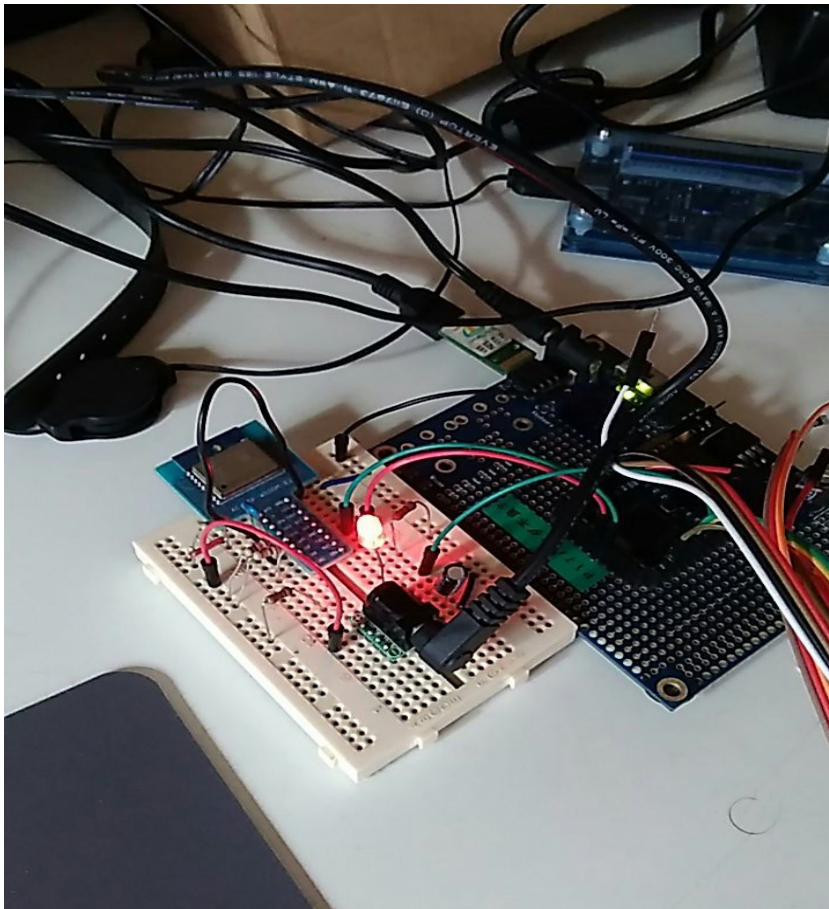
```
Prop0 Cog6 ok
testTelnet
9 characters

19_100 00_009:
19_100: 065 084 013 013 010 013 010 079 075 067 108 101 097 114 032 105   AT.....OKClear i
AT



OK
110 characters

19_100 00_110:
19_100: 013 010 065 084 043 071 077 082 013 013 010 065 084 032 118 101   ..AT+GMR...AT ve
19_116: 114 115 105 111 110 058 048 046 052 048 046 048 046 048 040 065   rsion:0.40.0.0(A
19_132: 117 103 032 032 056 032 050 048 049 053 032 049 052 058 052 053   ug  8 2015 14:45
19_148: 058 053 056 041 013 010 083 068 075 032 118 101 114 115 105 111   :58)..SDK versio
19_164: 110 058 049 046 051 046 048 013 010 099 111 109 112 105 108 101   n:1.3.0..compile
19_180: 032 116 105 109 101 058 065 117 103 032 049 049 032 050 048 049    time:Aug 11 201
19_196: 053 032 049 055 058 048 050 058 049 056 013 010 079 075 032 099   5 17:02:18..OK c


AT+GMR


AT version:0.40.0.0(Aug  8 2015 14:45:58)

SDK version:1.3.0

compile time:Aug 11 2015 17:02:18

OK
24 characters

19_100 00_024:
19_100: 013 010 065 084 043 067 087 077 079 068 069 095 067 085 082 061   ..AT+CWMODE_CUR=
19_116: 049 013 013 010 013 010 079 075 052 048 046 048 046 048 040 065   1.....OK40.0.0(A


AT+CWMODE_CUR=1



OK
84 characters

19_100 00_084:
19_100: 013 010 065 084 043 067 087 074 065 080 095 067 085 082 061 034   ..AT+CWJAP_CUR="
19_116:  --SSID--
19_132:  --password--
19_148: 013 013 010 087 073 070 073 032 067 079 078 078 069 067 084 069   ...WIFI CONNECTE
19_164: 068 013 010 087 073 070 073 032 071 079 084 032 073 080 013 010   D..WIFI GOT IP..
19_180: 013 010 079 075 101 058 065 117 103 032 049 049 032 050 048 049   ..OKe:Aug 11 201


AT+CWJAP_CUR="SSID","password"


WIFI CONNECTED

WIFI GOT IP



OK
82 characters

19_100 00_082:
19_100: 013 010 065 084 043 067 073 070 083 082 013 013 010 043 067 073   ..AT+CIFSR...+CI
```

```
19_116: 070 083 082 058 083 084 065 073 080 044 034 049 057 050 046 049   FSR:STAIP,"192.1
19_132: 054 056 046 050 046 049 048 051 034 013 010 043 067 073 070 083   68.2.103"..+CIFS
19_148:
19_164:
19_180: 079 075 079 075 101 058 065 117 103 032 049 049 032 050 048 049   OKOKe:Aug 11 201


AT+CIFSR


+CIFSR:STAIP,"192.168.2.103"     ←-- IP address

+CIFSR:STAMAC,"MAC address"



OK
20 characters

19_100 00_020:
19_100: 013 010 065 084 043 067 073 080 077 085 088 061 049 013 013 010   ..AT+CIPMUX=1...
19_116: 013 010 079 075 083 084 065 073 080 044 034 049 057 050 046 049   ..OKSTAIP,"192.1


AT+CIPMUX=1



OK
26 characters

19_100 00_026:
19_100: 013 010 065 084 043 067 073 080 083 069 082 086 069 082 061 049   ..AT+CIPSERVER=1
19_116: 044 050 051 013 013 010 013 010 079 075 034 049 057 050 046 049   ,23.....OK"192.1


AT+CIPSERVER=1,23



OK
2 characters

19_100 00_002:
19_100: 013 010 065 084 043 067 073 080 083 069 082 086 069 082 061 049   ..AT+CIPSERVER=1

          ---- Started TeraTerm as Telnet-client on Windows8.1 ----
11 characters

19_100 00_011:
19_100: 048 044 067 079 078 078 069 067 084 013 010 086 069 082 061 049   0,CONNECT..VER=1
0,CONNECT

27 characters

19_100 00_027:
19_100: 013 010 043 073 080 068 044 048 044 049 053 058 255 251 024 255   ..+IPD,0,15:....
19_116: 253 003 255 251 003 255 253 001 255 251 031 049 057 050 046 049   ...........192.1


+IPD,0,15:ÿ⊠Eÿÿ⊠Eÿÿ⊠E4 characters
          ---- Keyin "1" on TeraTerm ----
19_100 00_014:
19_100: 013 010 043 073 080 068 044 048 044 051 058 049 013 010 024 255   ..+IPD,0,3:1....


+IPD,0,3:1
          ---- Keyin "0" on TeraTerm ----
14 characters
```

```
19_100 00_014:
19_100: 013 010 043 073 080 068 044 048 044 051 058 048 013 010 024 255   ..+IPD,0,3:0....


+IPD,0,3:0
              ---- Keyin "1" on TeraTerm ----
14 characters

19_100 00_014:
19_100: 013 010 043 073 080 068 044 048 044 051 058 049 013 010 024 255   ..+IPD,0,3:1....


+IPD,0,3:1
              ---- Keyin "0" on TeraTerm ----
14 characters

19_100 00_014:
19_100: 013 010 043 073 080 068 044 048 044 051 058 048 013 010 024 255   ..+IPD,0,3:0....


+IPD,0,3:0

14 characters
              ---- Keyin "1" on TeraTerm ----
19_100 00_014:
19_100: 013 010 043 073 080 068 044 048 044 051 058 049 013 010 024 255   ..+IPD,0,3:1....


+IPD,0,3:1
              ---- TeraTerm terminated ----
10 characters

19_100 00_010:
19_100: 048 044 067 076 079 083 069 068 013 010 058 049 013 010 024 255   0,CLOSED..:1....
0,CLOSED
```

Using under Linux
echo "1" > /dev/tcp/192.168.2.103/23   ← LED on
```
34 characters

18_794 00_034:
18_794: 048 044 067 079 078 078 069 067 084 013 010 013 010 043 073 080   0,CONNECT....+IP
18_810: 068 044 048 044 050 058 049 010 048 044 067 076 079 083 069 068   D,0,2:1.0,CLOSED
18_826: 013 010 046 049 046 049 049 034 013 010 043 067 073 070 083 082   ...1.11"..+CIFSR
0,CONNECT



+IPD,0,2:1
          0,CLOSED
```

echo "0" > /dev/tcp/192.168.2.103/23   ← LED off
```
34 characters

18_794 00_034:
18_794: 048 044 067 079 078 078 069 067 084 013 010 013 010 043 073 080   0,CONNECT....+IP
18_810: 068 044 048 044 050 058 048 010 048 044 067 076 079 083 069 068   D,0,2:0.0,CLOSED
18_826: 013 010 046 049 046 049 049 034 013 010 043 067 073 070 083 082   ...1.11"..+CIFSR
0,CONNECT



+IPD,0,2:0
          0,CLOSED
```

Internet

MODEM

BroadBand
Router
192.168.1.1

Linux 192.168.1.3

192.168.1.10

Wireless LAN
AP access mode

192.168.1.7

WiFi
192.168.1.12

Windows8.1

Windows Vista
No LAN connection

WiFi
192.168.1.11

ESP-WROOM-02

WiFi
192.168.1.8

Smartphone
Geanee
Android4.2.2

WiFi
192.168.1.9

Smartphone
VAIO
Android5.0.2

This merely display string on client PC's browser.

In case of '1 wconstant debug', all message from ESP-WROOM-02 is displayed on TeraTerm.

```
Prop0 Cog6 ok
WebServer1


..
..
..


37 characters

19_376 00_037:
19_376: 065 084 043 067 073 080 083 069 082 086 069 082 061 049 044 056   AT+CIPSERVER=1,8
19_392: 048 013 013 010 110 111 032 099 104 097 110 103 101 013 010 013   0...no change...
19_408: 010 079 075 013 010 034 013 010 043 067 073 070 083 082 058 083   .OK..”..+CIFSR:S
AT+CIPSERVER=1,80


no change


OK


IP address:192.168.1.11
                        <---- Wait until client request HTTP
304 characters          <---- Accsess from client

19_376 00_304:
19_376: 048 044 067 079 078 078 069 067 084 013 010 013 010 043 073 080   0,CONNECT....+IP
19_392: 068 044 048 044 050 056 048 058 071 069 084 032 047 032 072 084   D,0,280:GET / HT
19_408: 084 080 047 049 046 049 013 010 072 111 115 116 058 032 049 057   TP/1.1..Host: 19
19_424: 050 046 049 054 056 046 049 046 049 049 013 010 085 115 101 114   2.168.1.11..User
19_440: 045 065 103 101 110 116 058 032 077 111 122 105 108 108 097 047   -Agent: Mozilla/
19_456: 053 046 048 032 040 088 049 049 059 032 076 105 110 117 120 032   5.0 (X11; Linux
19_472: 105 054 056 054 059 032 114 118 058 051 051 046 048 041 032 071   i686; rv:33.0) G
19_488: 101 099 107 111 047 050 048 049 048 048 049 048 049 032 070 105   ecko/20100101 Fi
19_504: 114 101 102 111 120 047 051 051 046 048 013 010 065 099 099 101   refox/33.0..Acce
19_520: 112 116 058 032 116 101 120 116 047 104 116 109 108 044 097 112   pt: text/html,ap
19_536: 112 108 105 099 097 116 105 111 110 047 120 104 116 109 108 043   plication/xhtml+
19_552: 120 109 108 044 097 112 112 108 105 099 097 116 105 111 110 047   xml,application/
19_568: 120 109 108 059 113 061 048 046 057 044 042 047 042 059 113 061   xml;q=0.9,*/*;q=
19_584: 048 046 056 013 010 065 099 099 101 112 116 045 076 097 110 103   0.8..Accept-Lang
19_600: 117 097 103 101 058 032 101 110 045 085 083 044 101 110 059 113   uage: en-US,en;q
19_616: 061 048 046 053 013 010 065 099 099 101 112 116 045 069 110 099   =0.5..Accept-Enc
19_632: 111 100 105 110 103 058 032 103 122 105 112 044 032 100 101 102   oding: gzip, def
19_648: 108 097 116 101 013 010 067 111 110 110 101 099 116 105 111 110   late..Connection
19_664: 058 032 107 101 101 112 045 097 108 105 118 101 013 010 013 010   : keep-alive....
0,CONNECT



+IPD,0,280:GET / HTTP/1.1

Host: 192.168.1.11

User-Agent: Mozilla/5.0 (X11; Linux i686; rv:33.0) Gecko/20100101 Firefox/33.0

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8

Accept-Language: en-US,en;q=0.5

Accept-Encoding: gzip, deflate
```

Connection: keep-alive

connectionID:0
26 characters

19_376 00_026:
19_376: 065 084 043 067 073 080 083 069 078 068 061 048 044 053 048 013   AT+CIPSEND=0,50.
19_392: 013 010 013 010 079 075 013 010 062 032 084 032 047 032 072 084   ....OK..> T / HT
AT+CIPSEND=0,50

OK

>
<html><h1>Hello!! This is PropForth5.5</h1></html>   -- Sent data to client
28 characters

19_376 00_028:
19_376: 013 010 082 101 099 118 032 053 048 032 098 121 116 101 115 013   ..Recv 50 bytes.
19_392: 010 013 010 083 069 078 068 032 079 075 013 010 047 032 072 084   ...SEND OK../ HT

Recv 50 bytes

SEND OK

32 characters

19_376 00_032:
19_376: 065 084 043 067 073 080 067 076 079 083 069 061 048 013 013 010   AT+CIPCLOSE=0...
19_392: 048 044 067 076 079 083 069 068 013 010 013 010 079 075 013 010   0,CLOSED....OK..
AT+CIPCLOSE=0

0,CLOSED

OK
              <---- Wait until client request HTTP

Request from Linux to ESP-WROOM-02

+IPD,0,280:GET / HTTP/1.1

Host: 192.168.1.11

User-Agent: Mozilla/5.0 (X11; Linux i686; rv:33.0) Gecko/20100101 Firefox/33.0

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8

Accept-Language: en-US,en;q=0.5

Accept-Encoding: gzip, deflate

Connection: keep-alive

Request from Smartphone(geanee) to ESP-WROOM-02
+IPD,0,507:GET / HTTP/1.1

Host: 192.168.1.11

Connection: keep-alive

Cache-Control: max-age=0

x-wap-profile: http://*.*.*.*/Xianghe/MTK_Phone_KK_UAprofile.xml

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8

User-Agent: Mozilla/5.0 (Linux; Android 4.4.2; FXC-5A Build/KOT49H) AppleWebKit/537.36 (KHTML,
like Gecko) Version/4.0 Chrome/30.0.0.0 Mobile Safari/537.36

Accept-Encoding: gzip,deflate

Accept-Language: ja-JP,en-US;q=0.8

X-Requested-With: com.android.browser

Request from Smartphone(VAIO) to ESP-WROOM-02
+IPD,0,333:GET / HTTP/1.1

Host: 192.168.1.11

User-Agent: Mozilla/5.0 (Android 5.0.2; Mobile; rv:51.0) Gecko/51.0 Firefox/51.0

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8

Accept-Language: ja,ja-JP;q=0.8,en-US;q=0.5,en;q=0.3

Accept-Encoding: gzip, deflate

Connection: keep-alive

Upgrade-Insecure-Requests: 1

Request from Windows8.1 to ESP-WROOM-02
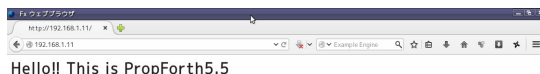+IPD,0,295:GET / HTTP/1.1

Host: 192.168.1.11

User-Agent: Mozilla/5.0 (Windows NT 6.3; WOW64; rv:43.0) Gecko/20100101 Firefox/43.0

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8

Accept-Language: ja,en-US;q=0.7,en;q=0.3

Accept-Encoding: gzip, deflate

Connection: keep-alive

Hello!! This is PropForth5.5

In case of '0 wconstant debug', no message from ESP-WROOM-02 is displayed on TeraTerm.

```
Prop0 Cog6 ok
WebServer1


..
..
..

IP address:192.168.1.11
connectionID:0                    <---- Accsess from client
<html><h1>Hello!! This is PropForth5.5</h1></html>
connectionID:0
                                  <---- Wait until client request HTTP
```