

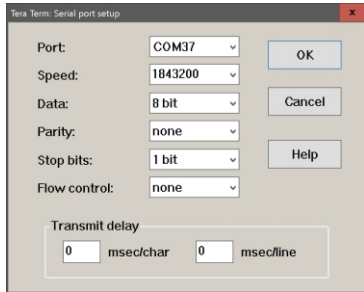
WAcouSense Quick Start

1. Power up and UART

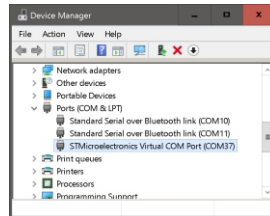
connect **USB-C** with PC

start **TeraTerm**:

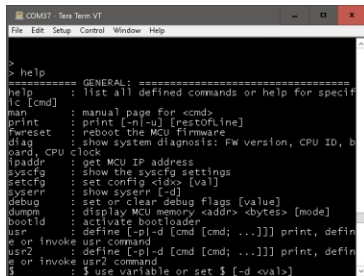
- select the VCP UART COM port of MCU
- set **any** baudrate, 8bit, no parity, no flow control



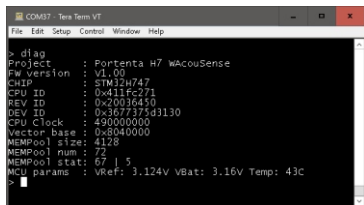
find COM port via "Device Manager"



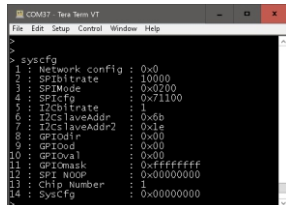
see command prompt
enter **help** for list of commands



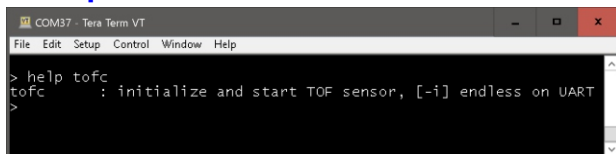
check FW version via **diag**



check system config via **syscfg**



get help for a specific command:
help <cmd>

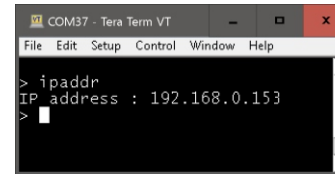


2. Network setup

connect board via **ETH cable** (RJ45)

option A: connect PC and MCU on network with router
(**not** direct cable, two cables to router)
network (router) has to run DHCP service
(dynamic IP address)

check if MCU got IP address via **ipaddr**:

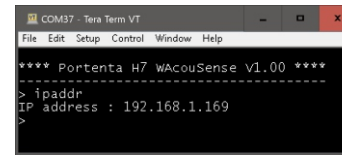


PC via DHCP ("dynamic") and
separate ETH cable
remember MCU IP address

blue LED

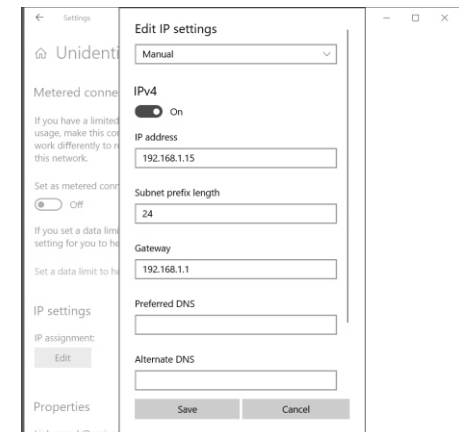
option B: connect MCU with PC using **direct cable** (not on network)
PC must be configured for STATIC IP address

check if MCU got IP address via **ipaddr**:



DHCP times out and MCU
falls back to STATIC IP address:
192.168.1.169
remember MCU IP address
red LED

configure PCs ETH adapter for STATIC
(manual):
on same network, with 24bit network mask



different IP address as MCU but
on same network

3. Check network connection

option A: use **ping** on PC (works only if DYNAMIC and DHCP):

```
C:\Users\tj\Documents\CubeIDE_workspace\PortentaH7_MacouSense\Python>ping 192.168.0.153

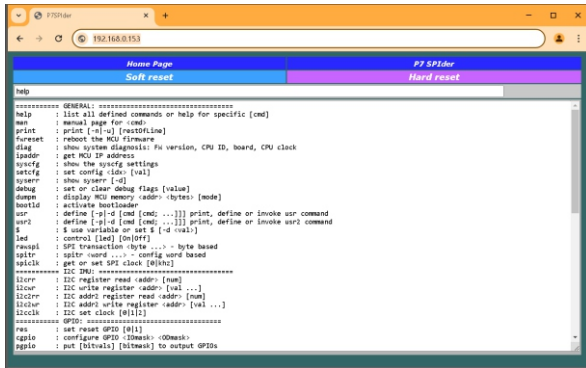
Pinging 192.168.0.153 with 32 bytes of data:
Reply from 192.168.0.153: bytes=32 time<1ms TTL=255
Reply from 192.168.0.153: bytes=32 time<1ms TTL=255
Reply from 192.168.0.153: bytes=32 time<1ms TTL=255
Reply from 192.168.0.153: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.0.153:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\tj\Documents\CubeIDE_workspace\PortentaH7_MacouSense\Python>
```

MCU IP address

option B: access MCU with **Web Browser**:



MCU IP address

see web page and enter any command, e.g. **help**

option C: start Python script **CMD_TCP.py**:

```
C:\Users\tj\Documents\CubeIDE_workspace\PortentaH7_MacouSense\Python>python CMD_TCP.py

HTTP/1.1 200 OK
Content-type: text/html

<!DOCTYPE HTML>
<html><body><pre>
===== GENERAL: =====
help      : list all defined commands or help for specific [cmd]
man       : manual page for [cmd]
print     : print [-n|-u] [restOfLine]
reset     : reboot the MCU firmware
diag      : show system diagnosis: FW version, CPU ID, board, CPU clock
ipaddr    : get MCU IP address
syscfg    : show the syscfg settings
setcfg    : set config <ido> [val]
syserr    : show syserr [-d]
debug     : set or clear debug flags [value]
dump      : display MCU memory <addr> <bytes> [mode]
bootld    : activate bootloader
usr       : define [-pl|-d] [cmd [cmd; ...]] print, define or invoke usr command
usr2      : define [-pl|-d] [cmd [cmd; ...]] print, define or invoke usr2 command
$         : $ use variable or set $ [-d <val>]
led       : control [led] [On|Off]
ramspi    : SPI transaction <byte ...> - byte based
spitr     : spitr <word ...> - config word based
spiclk    : get or set SPI clock [0|kHz]
===== I2C I2M: =====
i2cr      : I2C register read <addr> [num]
i2cw      : I2C write register <addr> [val ...]
i2cwr     : I2C write register <addr> [val ...]
i2cclk    : I2C set clock [kHz]
===== QSPI: =====
qspi      : set reset QSPI [0|1]
qspi      : configure QSPI <mask> <QMask>
qspi      : get [initials] [address] to output QSPIs

=====
```

see help text, see prompt, enter any command, e.g. **help**

ATT: make sure Python script will use **MCU IP address**:
edit Python script and see line:

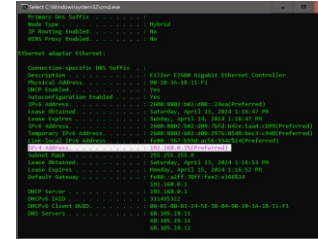
```
#CMD_TCP.py [-i Documents\CubeIDE_workspace\PortentaH7_MacouSense\Python] - GVM
File Edit Tools Syntax Buffers Window Help
#DHCPUsed = False

#the STATIC IP address if DHCP is not used
defaultHostIPaddress = "192.168.0.153"

if isDHCPUsed == True:
    #we can resolve IP address by name via NETBIOS - define the MCU hostname
    defaultHostName = "dscmcutj" #if not empty - use the name and resolve
    -- VISUAL -- 39 16,39 5%
```

4. Stream PDM MIC audio:

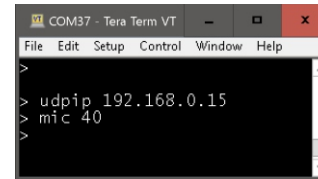
Requirement: have **VBAN** (like VB Audio, Voicemeeter) installed
get the IP address of PC: Windows OS: **ipconfig /all**



Remember PC IP address

enable MCU streaming:

udpip <PC_IPaddress>
mic <db>



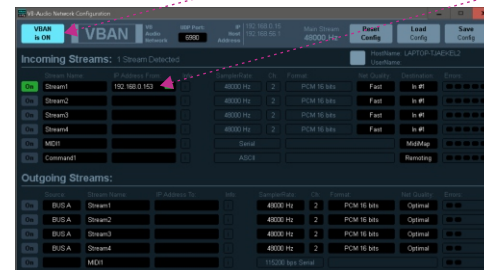
configure and enable **VBAN** audio (in **Voicemeeter**):



click on it to see stream setup

enable VBAN reception

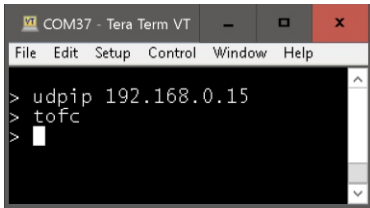
MCU IP address



5. Get TOF sensor data via network:

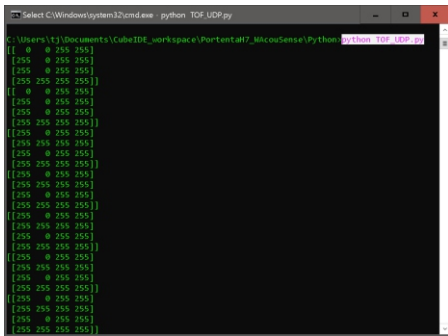
enable MCU streaming:

**udpip <PC_IPaddress>
tofc**

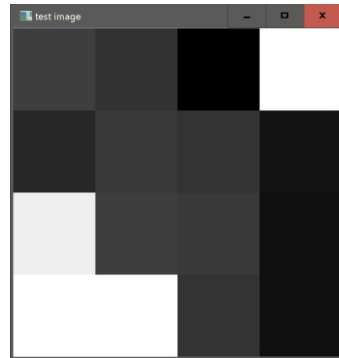


```
COM37 - Tera Term VT
File Edit Setup Control Window Help
> udpip 192.168.0.15
> tofc
>
```

start Python script **TOF_UDP.py** (nothing to modify/set):



```
Select C:\Windows\system32\cmd.exe - python TOF_UDP.py
C:\Users\tj\Documents\CubeIDE_workspace\PortentaH7_MAcouSense\Python> python TOF_UDP.py
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
[[ 0 0 255 255]
 [255 0 255 255]
 [255 255 255 255]
 [255 255 255 255]]
```



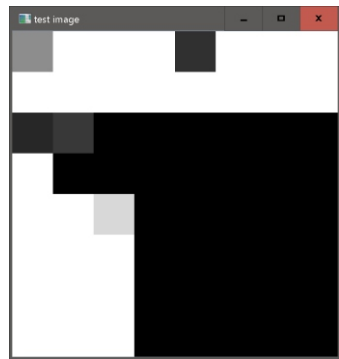
default: 4x4

change to 8x8 on UART via:

tofp 1



```
COM37 - Tera Term VT
File Edit Setup Control Window Help
>
> tofp 1
>
```



8x8

toggle back to 4x4 on UART via:

tofp 1

6. Get PDM MIC audio via Python:

tbd

(listen on UDP port 6980 (instead of using VBAN tool, get and decode VBAN audio streaming, "sounddevice" in Python with audio packets via network UDP)

7. Update (flash) new MCU FW:

Easiest way: with **Arduino Bootloader** (located in MCU):

find tool **dft-util.exe** in project folder **FWFlash**

press reset button **quickly twice**:

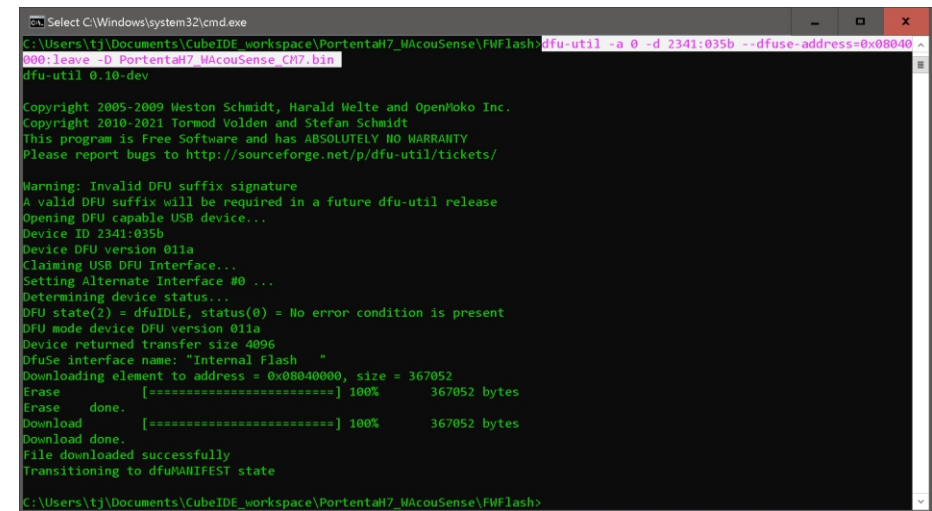
you should see a **fading blinking green LED**

if not: disconnect and connect USB-C very briefly

enter on CMD line:

```
dfu-util -a 0 -d 2341:035b --dfuse-address=0x08040000:leave -D PortentaH7_WAcouSense_CM7.bin
```

or see in file **flash_command.txt**



```
Select C:\Windows\system32\cmd.exe
C:\Users\tj\Documents\CubeIDE_workspace\PortentaH7_MAcouSense\FWFlash> dfu-util -a 0 -d 2341:035b --dfuse-address=0x08040000:leave -D PortentaH7_WAcouSense_CM7.bin
dfu-util 0.10-dev

Copyright 2005-2009 Weston Schmidt, Harald Welte and OpenMoko Inc.
Copyright 2010-2021 Tormod Volden and Stefan Schmidt
This program is Free Software and has ABSOLUTELY NO WARRANTY
Please report bugs to http://sourceforge.net/p/dfu-util/tickets/

Warning: Invalid DFU suffix signature
A valid DFU suffix will be required in a future dfu-util release
Opening DFU capable USB device...
Device ID 2341:035b
Device DFU version 011a
Claiming USB DFU Interface...
Setting Alternate Interface #0 ...
Determining device status...
DFU state(2) = dfuIDLE, status(0) = No error condition is present
DFU mode device DFU version 011a
Device returned transfer size 4096
DfuSe interface name: "Internal Flash"
Downloading element to address = 0x08040000, size = 367052
Erase [=====] 100% 367052 bytes
Erase done.
Download [=====] 100% 367052 bytes
Download done.
File downloaded successfully
Transitioning to dfuMANIFEST state
C:\Users\tj\Documents\CubeIDE_workspace\PortentaH7_MAcouSense\FWFlash>
```

Other options:

- compile project in **STM32CubeIDE**, with STLINK V3 debugger connected and flash FW in IDE (e.g. via debug icon)
- generate BIN file and flash with **STM32CubeProgrammer** (start address is **0x08040000** !)