PicoSenTcp Manual

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1 Please read

***When using PicoSenTcp, be sure to check the terms of use on the Shiomachi Software website.**

<Terms of Use URL>
https://sites.google.com/view/shiomachisoft/english-home/terms-of-use

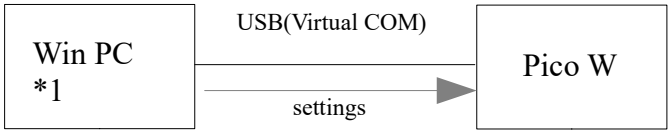
Furthermore, Shiomachi Software (the creator of PicoSenTcp) assumes no responsibility whatsoever for any trouble, loss, or damage arising from the use of PicoSenTcp or from the contents of this document.

2 Overview

(1) The microcontroller board uses Raspberry Pico W.
(2) Pico W sends the following sensor data via a TCP socket at 5-second intervals.
(a) GPIO input value
(b) ADC value (voltage value, Pico W temperature sensor value)
(c) Data from Bosch's BME280 (temperature, humidity, and air pressure sensor) *
*: If the BME280 is not connected, the data in (c) will be 0.
(3) Pico W acts as a TCP server.
(4) A wireless LAN router that supports the 2.4 GHz band Wi-Fi standard "IEEE 802.11b/g/n" is required.
(5) A dedicated PC app is used to set up the wireless LAN for Pico W.

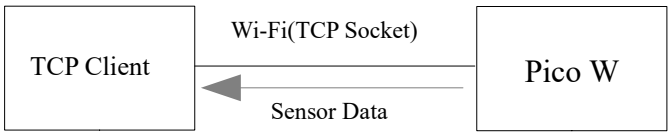
<System configuration >

-Wireless LAN settings



*1:Set up the Pico W's wireless LAN using the dedicated PC app.

■TCP socket communication of sensor data



3 Contents

3.1 Firmware (FW)

(1) PicoSenTcp_*XXXXXXXX*.uf2

*XXXXXXXX is the version date.

Write to Pico W.

3.2 PC App

(1) PicoJigApp_*XXXXX*フォルダ

* XXXX is the version.

This folder contains the binaries for PicoJigApp (an app that runs on a Windows PC).

PicoJigApp is used for wireless LAN settings.

4 Setup

4.1 Write FW to Pico W

Below are the steps to write the firmware to Pico W.

(1) While pressing the white button on the Pico W, connect the Pico W to your PC with a USB cable. The RPI-RP2 drive will then be recognized.

(2) Drag PicoSenTcp_XXXXXXXX.uf2 into the RPI-RP2.

This completes the firmware writing process.
The firmware will start up when the Pico W is turned on.

4.2 PC setup

(1) Copy the PicoJigApp_XXXXX folder to a suitable location on your PC (such as the desktop).
PicoJigApp is used for UART settings and wireless LAN settings.

For Windows, .NET Framework 4.x.x must be enabled, with .NET Framework 4.6.2 or higher.
Not compatible with .NET 5 and higher.
Enabling the .NET Framework is at your own risk.

5 LED

- If Pico W is not connected to a wireless LAN router, the LED will flash at 500ms intervals.
- If Pico W is connected to a wireless LAN router, the LED will be lit instead of flashing.

6 Pins Used

<GPIO input>

*Uses built-in pull-up.

GP10=Pin 14

GP11=Pin 15

GP12=Pin 16

GP13=Pin 17

GP14=Pin 19

GP15=Pin 20

<ADC>

ADC0=GP26=Pin 31

ADC1=GP27=Pin 32

ADC2=GP28=Pin 34

<I2C communication with BME280>

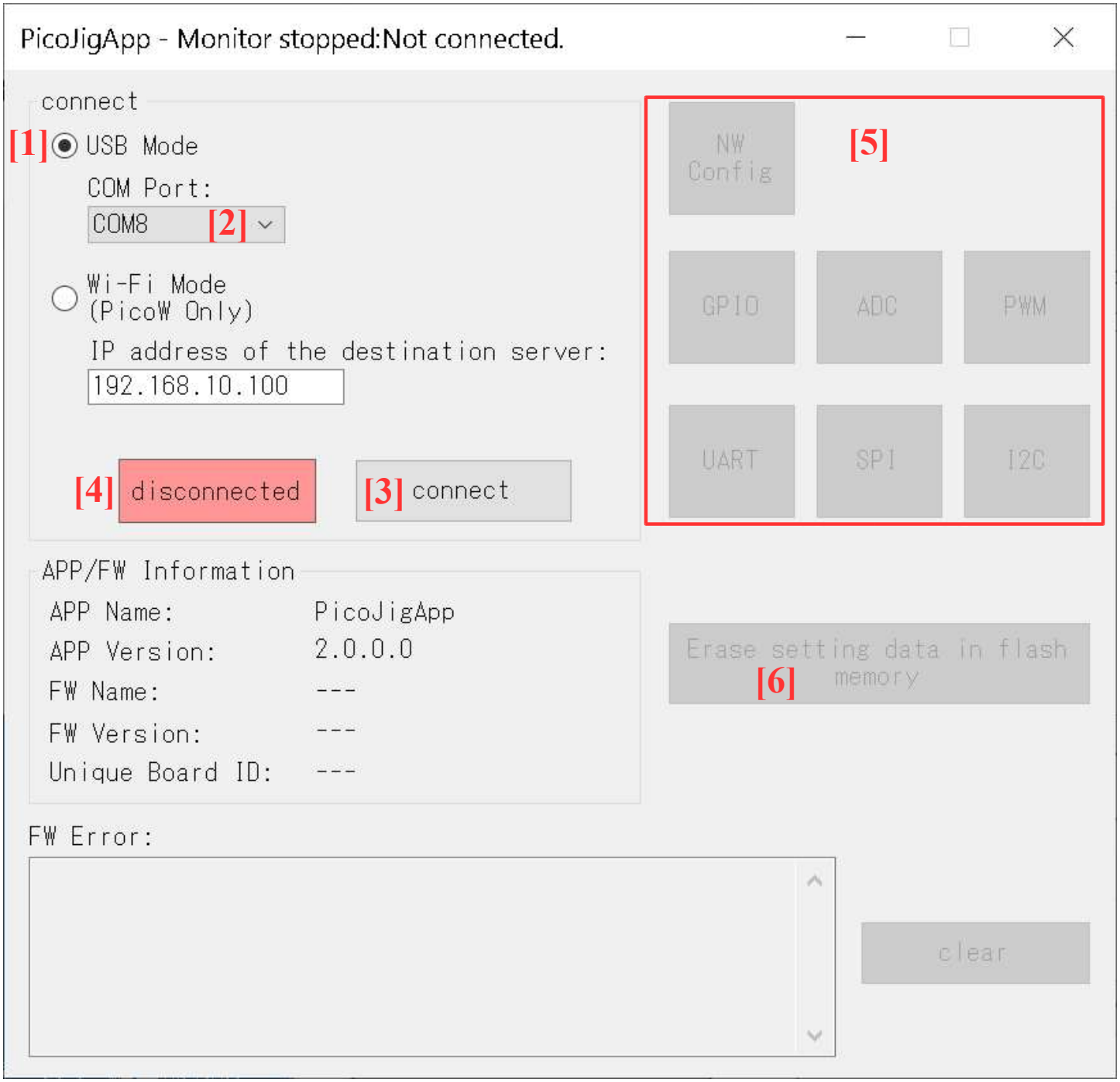
I2C0 SDA=GP8=Pin 11

I2C0 SCL=GP9=Pin 12

7 Configure Wireless LAN using PicoJigApp

7.1 Starting PicoJigApp

7.1.1 Main Screen



7.1.2 Start and Connection

(1) After connecting Pico W with the USB cable, wait about 10 seconds and then double-click PicoJigApp.exe in the PicoJigApp_XXXXX folder. *The reason for waiting about 10 seconds is because it takes time for Windows to recognize Pico W's virtual COM. Double-clicking PicoJigApp.exe will display the main screen from the <Main Screen> chapter.

(2) Leave [1] on the <Main screen> ON.

(3) After selecting the Pico COM number in [2] on the <Main screen>, press the [3] button.

If [4] on the <Main screen> changes to "connected", the connection to Pico W has been established.

If an error message box appears, try the following.
-If there are multiple COM numbers in the list in [2], change the COM number selection in [2] and then press [3].
-Check the connection of the Pico USB cable, wait 10 seconds, and then restart PicoJigApp.exe.

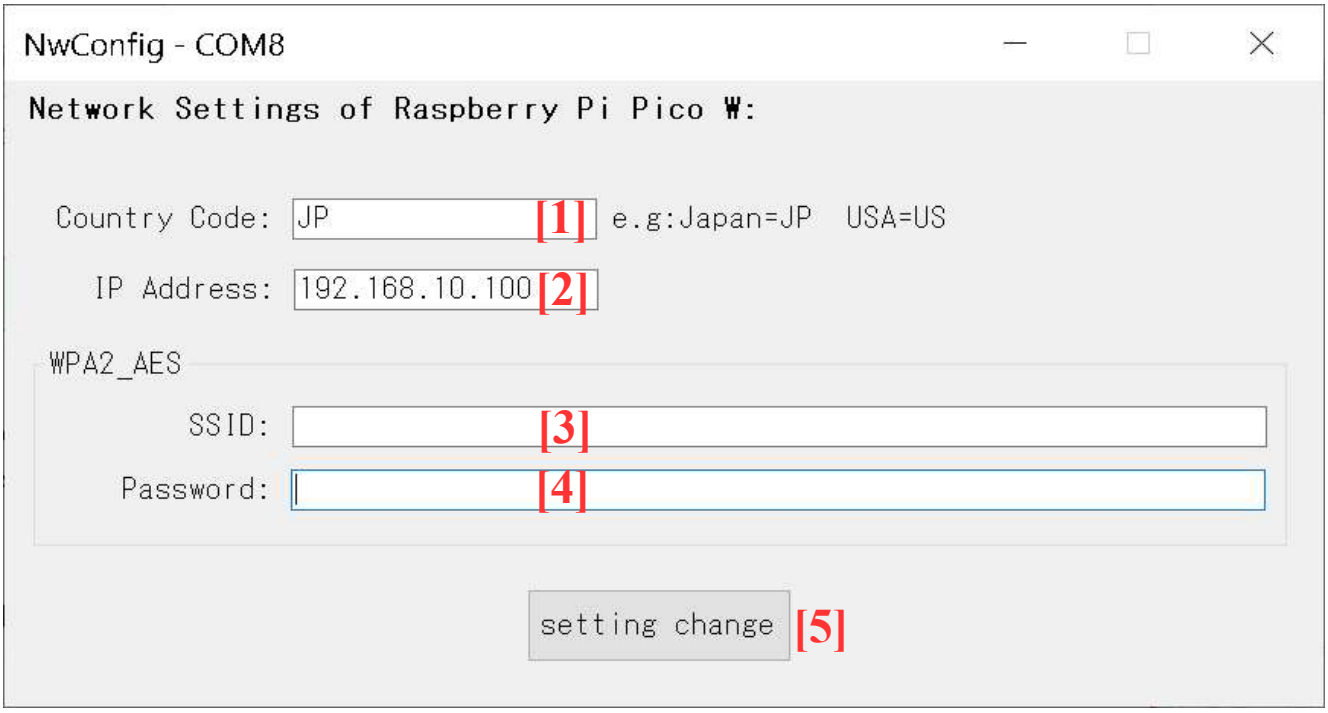
When [4] on the <Main screen> changes to "connected", the buttons in [5] (*1) and [6] on the <Main screen> will become enabled.

*1:
The NW Config button will become enabled.

7.2 Wireless LAN settings

7.2.1 Wireless LAN setting screen

The wireless LAN setting screen is displayed when you press the [NW Config] button in [5] on the <Main screen>.



(1) Enter the country code in the box [1].
<Example>
-Japan: JP
-United States: US

(2) Enter the IP address you want for your Pico W in the box [2].
<Example>
If you want your Pico W IP address to be 192.168.10.100:
192.168.10.100

*The socket port number is fixed at 7777.

(3) Enter the SSID of your wireless LAN router in the box [3].
*Conditions for the SSID of a wireless LAN router that can be specified:
-It must be compatible with the Wi-Fi standard "IEEE 802.11b/g/n" that uses the 2.4 GHz band. Be careful not to accidentally specify an SSID that uses the 5 GHz frequency band.
-The encryption method must be WPA2 (AES).

(4) Enter the password for your wireless LAN router in the box [4].

(5) Press the button [5] to configure the wireless LAN settings.

7.2.2 Erasing the configuration data in the Flash memory

The following setting data is saved in the end of the Pico W's Flash memory.
-Wireless LAN settings
*If you are no longer using PicoSenTcp, we recommend that you erase the setting data saved in the end of the Flash memory using the [6] button on the <Main screen>.

8 When using Grove's BME280 module

Grove is a module that can be used easily by simply plugging in the connector.

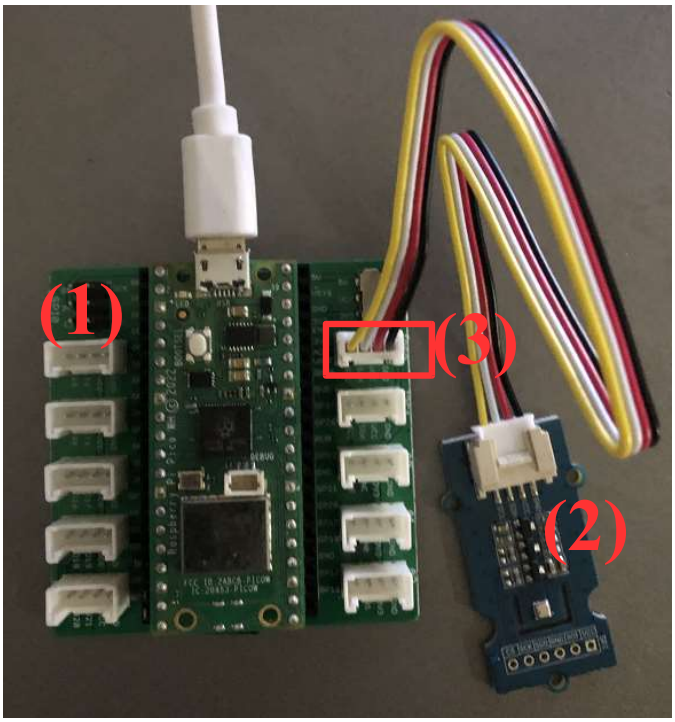
(1) Seeed Grovev Shield v1.0 for Raspberry Pi Pico

(2) Seeed Grove BME280 Environmental Sensor

Bosch BME280 is installed.

(3)Connector connected to the following pins on Pico.

- I2C0 SDA=GP8=pin 11
- I2C0 SCL=GP9=pin 12



9 When using Tera Term as a TCP client

***Preparation**

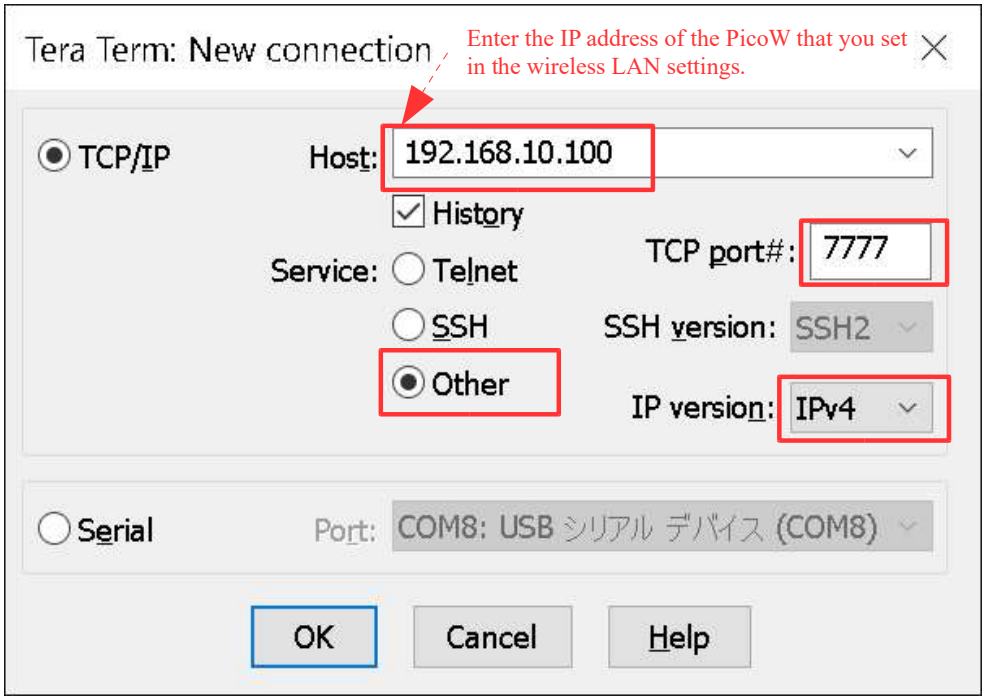
(1) Please complete the Wireless LAN settings.

(2) Please make sure that the LED on Pico W is lit and not flashing.
(Please make sure that Pico W is connected to the wireless LAN router.)

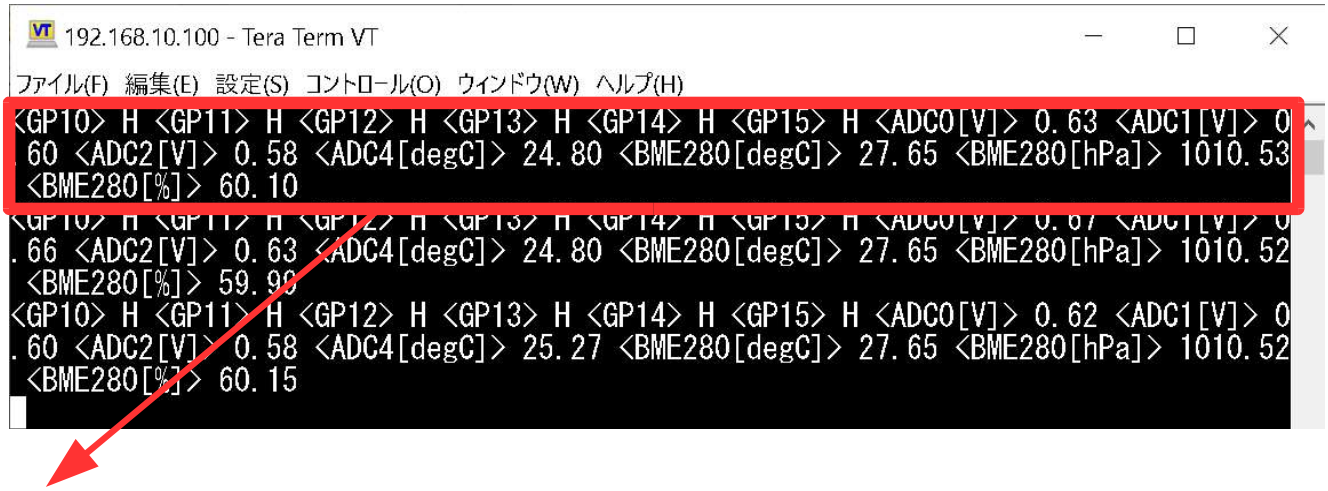
*If the LED continues to flash and does not light up, please do the following.

- Check that there are no devices near Pico W that may cause radio interference.
- Check that the Wireless LAN settings are correct.

***Tera Term Settings**



10 Data Format



- Sensor data is sent as an ASCII code string at 5 second intervals.
- Separator: Space
- Terminator: CrLf
- GPIO input value is H (High) or L (Low).
- Voltage (V), temperature (degC), air pressure (hPa), and humidity (%) are values up to two decimal places.