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substance

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6.03a	2021/09/07		first edition			
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1. appearance

1.1. UART pin settings

When controlling the UART via USB, set it to 5-6 short and 7-8 short.

MPU side			USB side
Reset	16	15	DTR
ISP SW	14	13	RTS
Gnd	12	11	Gnd
PPS2 Out	10	9	NC
TXD	8	7	RXD
RXD	6	5	TXD
Gnd	4	3	Gnd
+5.0V In	2	1	NC

1.2. Power Selection

By turning on one of the switches, the specified power supply is used.
Do not turn on more than one switch.

|	power
1	USB Bus Power
2	Battery connector
3	UART terminal

2. How to connect
  2.1. driver

When connected to a Windows PC with a USB cable, it will be recognized as a USB Serial Port. Drivers are usually installed automatically.

If it does not install, please download it from FTDI's website (https://ftdichip.com/drivers/vcp-drivers/) and install it.
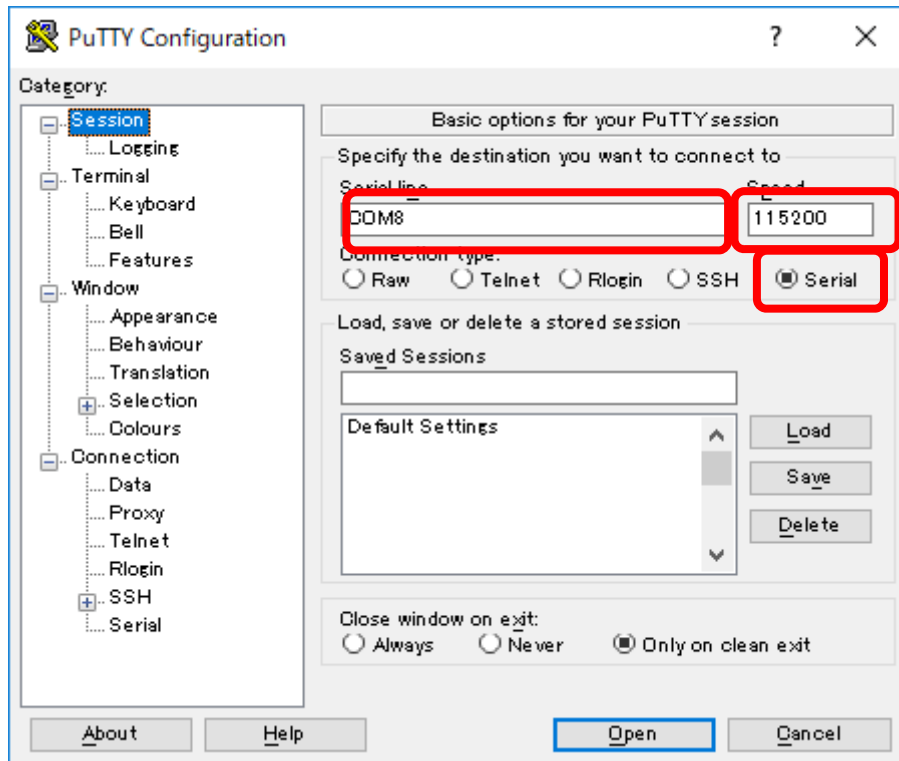
Two COM ports are recognized per module, and the younger port number is the UART control port.
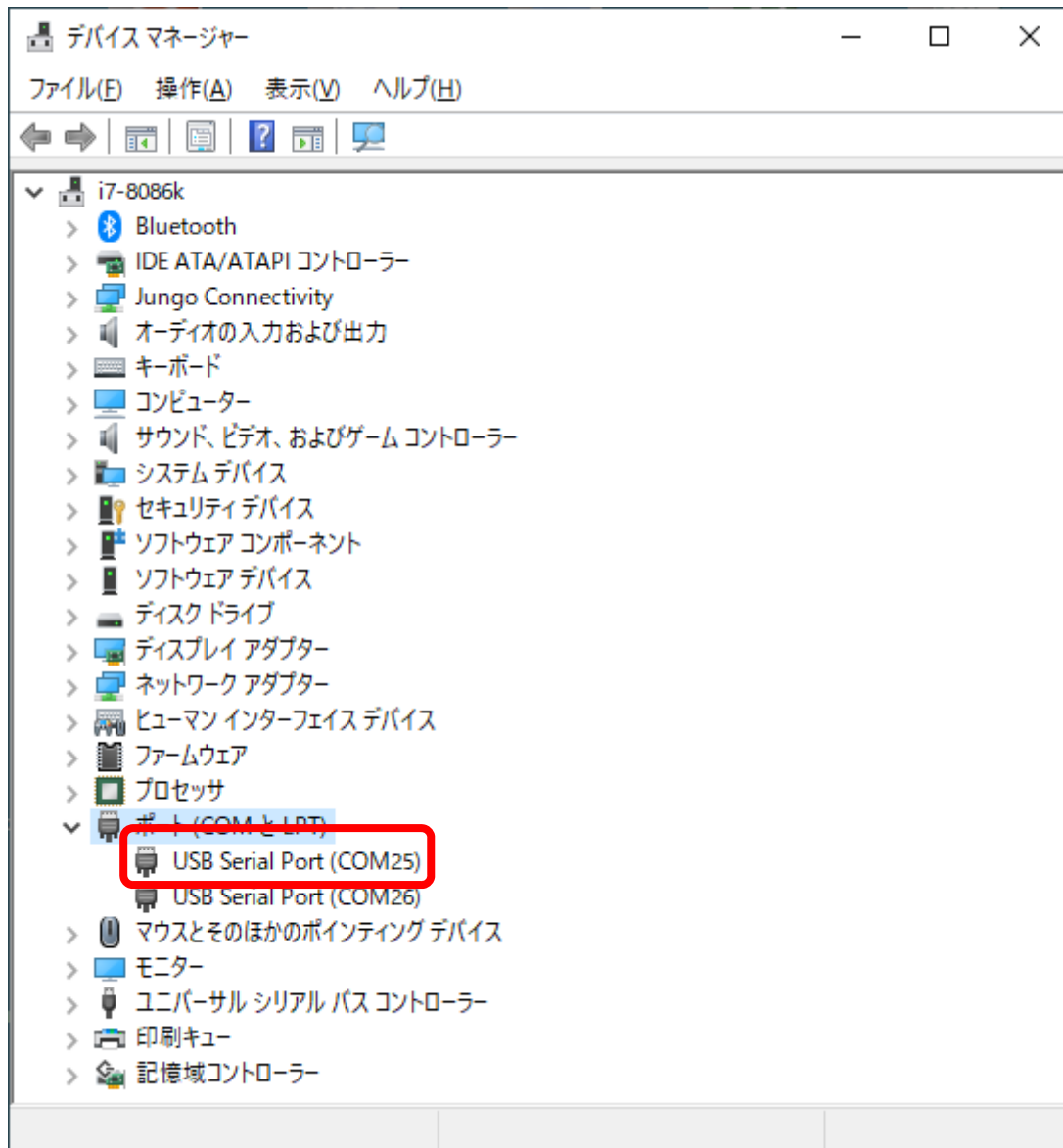
2.2. Terminal app

The WiWi module can be operated by connecting via the control port from the terminal app and entering commands. Since the newline code is optimized, the terminal app recommends PuTTY (https://www.putty.org/).

Example of setting in PuTTY (when connected to COM8)

PuTTY can also keep terminal logs by setting Logging to [All session output]. By using the [&Y&M&D&T] macro for the Log file name, you can make the file name the system time at the time of connection.
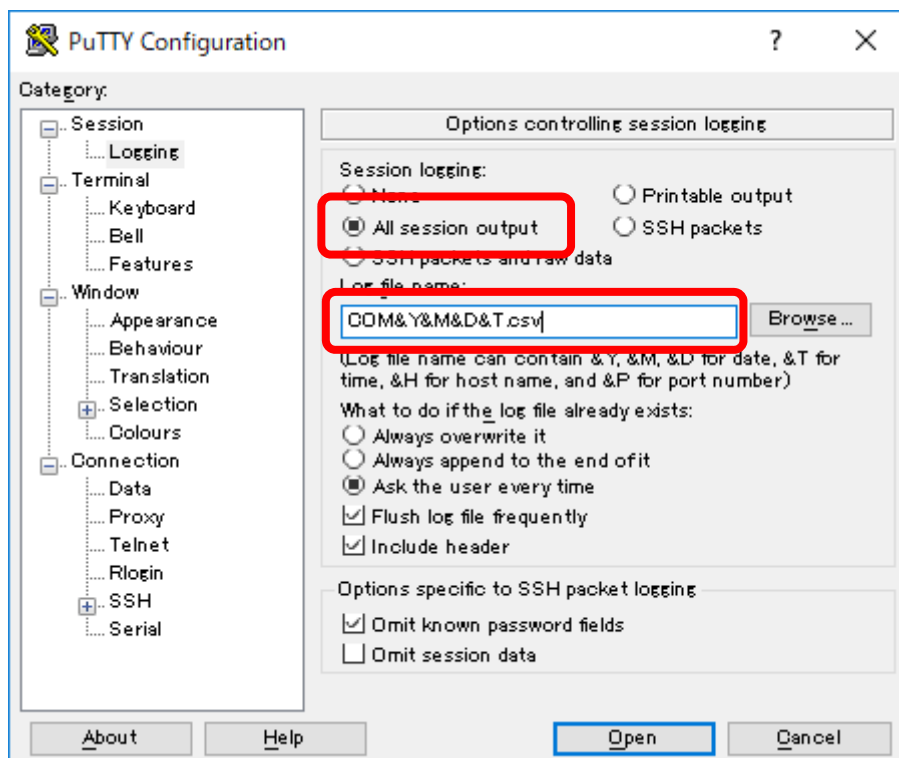
When using TeraTerm, etc., please refer to the following settings.

Terminal connection settings

Transmission speed	115200
Data Bit	8
parity	without
Stop Bit	1
flow control	without
Local echo	without
Inbound newline code	CR
Outbound newline code	CR

3. command

The command list is displayed by using the command [help].

Enter command options separated by spaces.

Also, if you enter only a command without options, the setting value is displayed.

command	substance
help	Displaying the Command List
info	Display of setting values saved in the internal flash memory
echo [on/off]	Echoback display settings
ack [on/off]	Setting the display of command results
error [on/off]	Error message display settings
reset	Software Reset
save	Saving settings
uart	Setting the Communication Speed of the C OM Port
ch [33-61]	ch setting
pa [0-1023]	Configuring the Send Output
phy [0-3]	Setting the wireless communication method
myid [1-254]	Configuring Module ID
mastered [1-254]	Configuring Master Module ID
timeslot [ID list]	Setting the Time Slots
pair [Pair list]]	Configuring target pairs to output with disp commands
wiwi [on/off]	Configuring Wi-Wi Operation
remote [reset/lock]	Remote control commands
lock [on/off]	Phase Lock command
disp [on/pff/raw/meas]	View the data
pid [p] [i] [d]	Setting the P ID Parameter
pf [value]	Adjustment value of frequency measurement
send [data]	Data Transmission
recv	Receiving Data
phase [0-6]	Getting the Phase
time[r/t/n/value]	Adjusting the time
dcxo [value]	Crystal oscillator adjustment value
rfsw [t/r/a]	Transmission and reception switching
antsw [i/e/a]	Antenna switching
adc [ch]	Displaying Analog Inputs
pps [value]	Configuring p ps output
autoexec [on/off]	Autorun settings
autolock [on/off]	Automatic Lock Settings
autocal [on/off]	Automatic calibration settings
admin [password]	Enter Manage Mode

4. Administrative Mode

Advanced settings can be made by entering a DMIN command and transitioning to the administration mode.

The default password for admin mode is "nict2021".

Illegal radio waves may be sent out by the management mode command, so please use it with caution.

command	substance
maxpa [0-1023]	Maximum transmit power
cca [0-255]	Career Sense Threshold
test [0-11]	Commands for technical certification tests
rr [t/r] [b] [r]	RF chip reading
rw [t/t] [b] [r] [v]	RF chip write
password [password]	Change Admin Password

4.1. maxpa

Sets the maximum transmit power. Set the upper limit that can be set with the pa command.

Set to 20mW at the factory according to individual differences in modules.

4.1. cca

Set the Career Sense threshold. If the Carrier Sense ED value is greater than or equal to this value, the channel is in use.

Note that the receive amplifier gain is different between carrier sense and packet reception.

Set to -83dBm at the factory to match the individual differences in modules.

4.1. test

This command is for technical aptitude certification test. The option number performs the following behavior.

0. End of test
   Stop the test transmission and end the test.
1. Frequency deviation test
   Send out the CW. Continue sending until t est 0 is entered.
2. Occupied Frequency Band Width Test
   Sends out the PN9 code. Continue sending until t est 0 is entered.
3. Spurious radiation, undesired vehicle intensity test
   Same behavior as test 2.
4. Aerial line power deviation test
   Same behavior as test 2.
5. Adjacent Channel Leakage Power Test
   Same behavior as test 2.
6. Limit test of secondary radio waves, etc.
   Wait with the module in the receiving state. Continue waiting until t est 0 is entered.
7. Transmission Time Limiting Device Test
   Sends dummy data at 5ms intervals. Do not send when the sending limit is reached. Continue sending until t est 0 is entered.
8. Career Sense Function Test
   It sends dummy data at 5 0ms intervals and outputs the result of carrier sense. Continue sending until t est 0 is entered.
9. BER Test
   Start BER measurement. Continue sending until t est 0 is entered.

10. Data Transmission Test
    It sends dummy data at 100ms intervals and displays the results received by yourself.
11. Data Reception Test
    Wait for reception and display the received data at 100ms intervals.

----- Command List ---
maxpa [0-1023]   :Set MAX power amp
cca [0-255]   :Set CCA Threshold
test [0-11]   :Technical certification test
rssi [mag] [adj]   :Adjust RSSI
rr [t/r] [b] [r]   :Read Rf chip register
rw [t/r] [b] [r] [v]   :Write Rf chip register
admin [password]   :Enter to Administrator mode
password [password]   :Set Administrator Password

**5.** Firmware rewrite
  5.1. Firmware Rewrite Tool
To rewrite the firmware, a tool called FlashMasic is used.
Please download and install the tool from HP (https://www.flashmagictool.com/).

  5.1. How to renew firmware

1) Connect the WiWi module to your PC
2. Change Device to LPC55S28 (UART).
3) Changed Serial Port to control port.
4. Set the Hex file to File.
5) Hold down ISP SW on the WiWi module and press Reset SW to enter rewrite mode
6) Press the Start button

If you also want to erase internal stored data, check Fill Unused Flash.
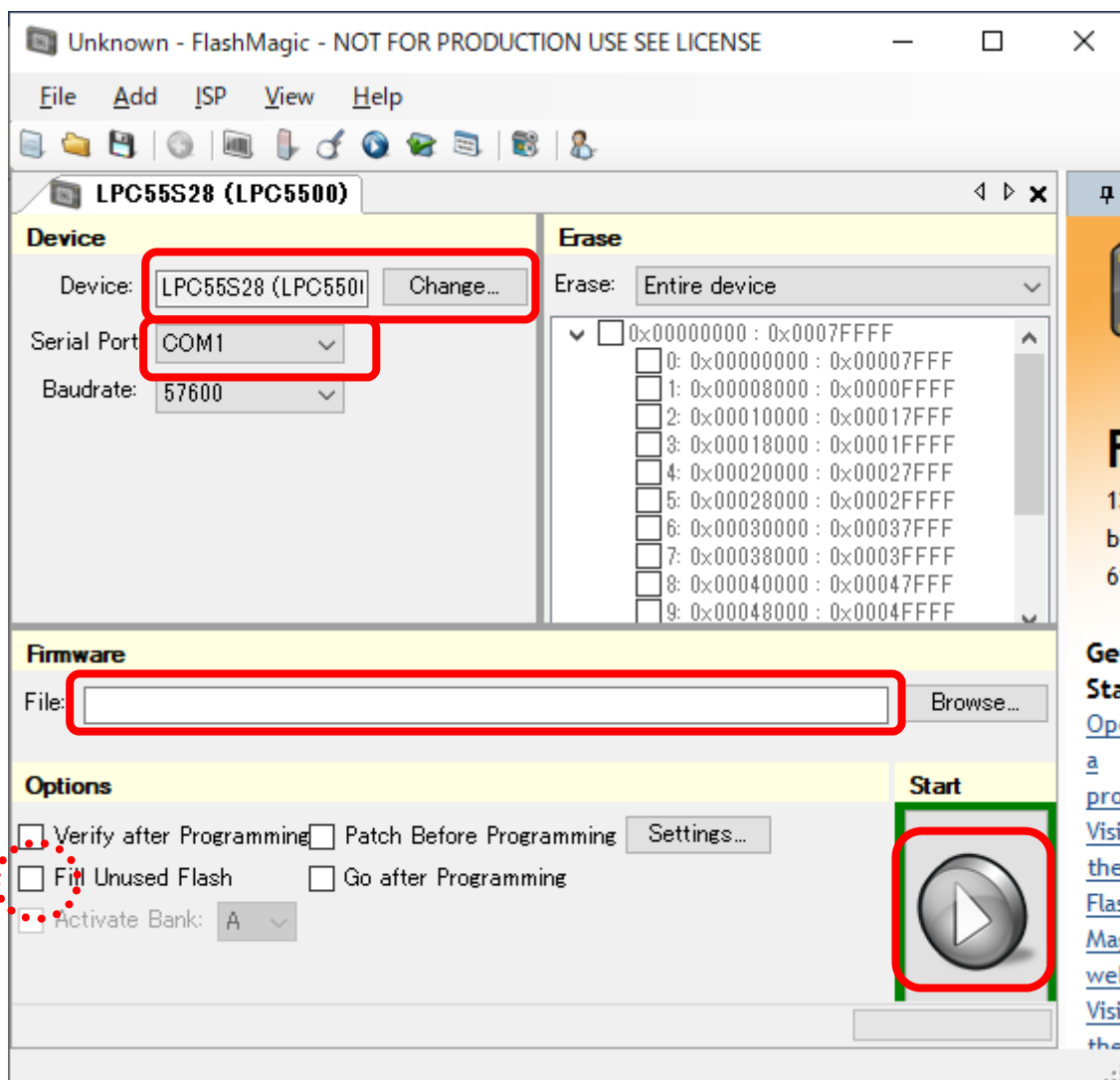
6. Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:
. Reorient or relocate the receiving antenna.
. Increase the separation between the equipment and receiver.
. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
. Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.