User's Manual

Renesas LPWA Studio

User's Manual

Renesas Electronics
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General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.
2. Processing at power-on

   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.
3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.
4. Handling of unused pins

   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.
5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.
6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.
8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

Renesas LPWA Studio

Contents

1. Overview

This document is user's manual for the Renesas LPWA Studio V4.3.0.0.
Renesas LPWA Studio is the GUI front-end program for the Radio Evaluation Program V4.50.

Features:

- Supports both **LoRa®** modulation and **GFSK** modulation
- Continuous wave transmission mode supports both unmodulated transmission wave and modulated transmission wave.
- Packet transmission mode supports **PN9** data packet for **PER/BER**, **DevEUI** data packet, and user defined data packet.
- Packet reception mode supports dual channel packet capture with built-in **LoRaWAN® decoder** and **PER/BER testing**.
- **Spectrum** mode supports real-time **RSSI** visualization (simple spectrum analyzer).
- **Terminal** mode supports all AT commands of the **Radio Evaluation Program** for the expert users.
- Supports packet forwarder for the **Wireshark with LoRaTap over UDP protocol**.
- Supports packet capture from the **Semtech PicoCell Gateway with Packet Forwarder.**
- Supports packet in/out with JSON/UDP for **external Apps** (for example, Renesas LPWA Studio, Python, Ruby, …).

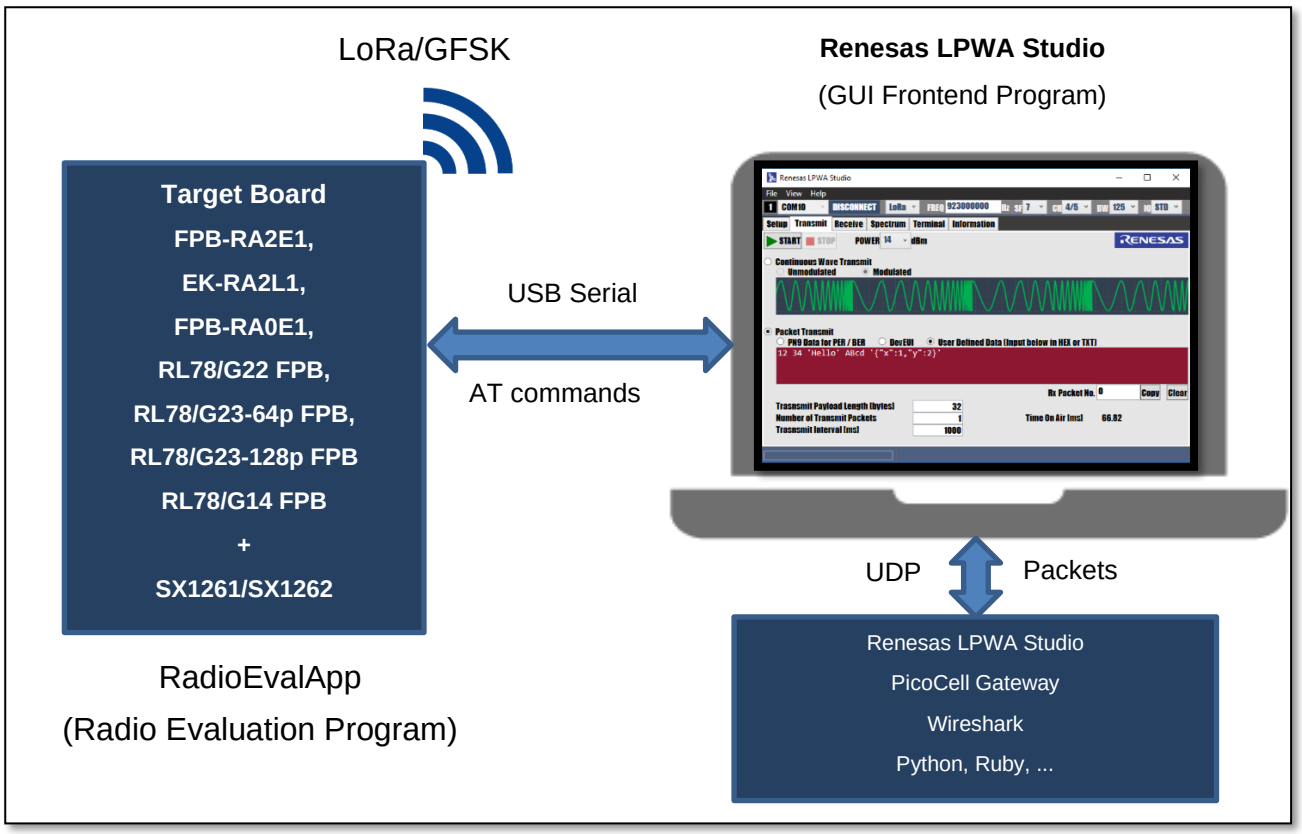

Figure 1. Renesas LPWA Studio System Overview

2. Requirements

The minimum requirements to install and run this software as follows.

1. Evaluation Board

    - FPB-RA2E1 (with Pmod USBUART) or
      EK-RA2L1 (with Pmod USBUART) or
      FPB-RA0E1 (with Pmod USBUART) or
      RL78/G22 Fast Prototyping Board or
      RL78/G23-64p Fast Prototyping Board or

RL78/G23-128p Fast Prototyping Board or
RL78/G14 Fast Prototyping Board (with Pmod USBUART)

- Semtech SX1261 Shield or Semtech SX1262 Shield
- Renesas HS3001 Humidity and Temperature sensor Pmod Module US082-HS3001EVZ (Optional)

2. PC : Microsoft Windows 10 (64-bit) with **.NET Framework 4.8**
3. Radio Evaluation Program: **RadioEvalApp V4.50 or later**

3. Getting Started

3.1 Setup the Radio Evaluation Program

Before using the Renesas LPWA Studio, install the Radio Evaluation Program on your evaluation board.

For more detail, please refer to the following Application Notes:

- For RL78: *RL78/G23, RL78/G22, RL78/G14 LoRa®-based Wireless Software Package* (R11AN0595)
- For RA: *RA2E1, RA2L1, RA0E1 LoRa®-based Wireless Software Package* (R11AN0596)

3.2 Install and Uninstall the Renesas LPWA Studio

IMPORTANT: If an older version of this program is installed on your PC, please uninstall the older version before installing new version.

Install the Renesas LPWA Studio:

1. Double-click the following windows installer and click **Install.**

```
(package install top folder)\samples\tools\RLPWAStudio\setup.exe
```

Note: If **.NET Framework 4.8** is not installed on your PC, the installer will try to install it.

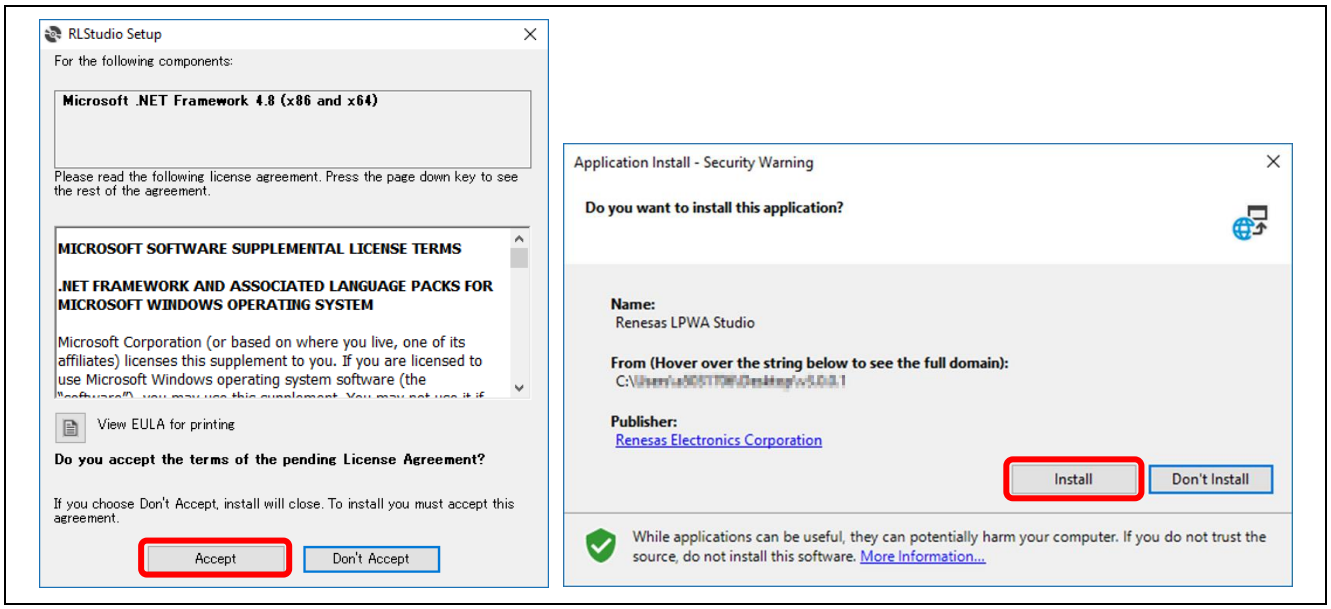

Figure 2. Renesas LPWA Studio Installation

2. If the installation is completed, Renesas LPWA Studio will be started automatically.
   You can also start from the **Start** menu > **Renesas Electronics** > **Renesas LPWA Studio**.

Uninstall the Renesas LPWA Studio:

Right click **Start Menu** > **Settings** > **Apps** > Select **Renesas LPWA Studio** > Click **Uninstall**.

4. Using Renesas LPWA Studio [Basic]

4.1 Connect and Disconnect the Radio Evaluation Program

Click pulldown list and select the COM port associated with your target board.

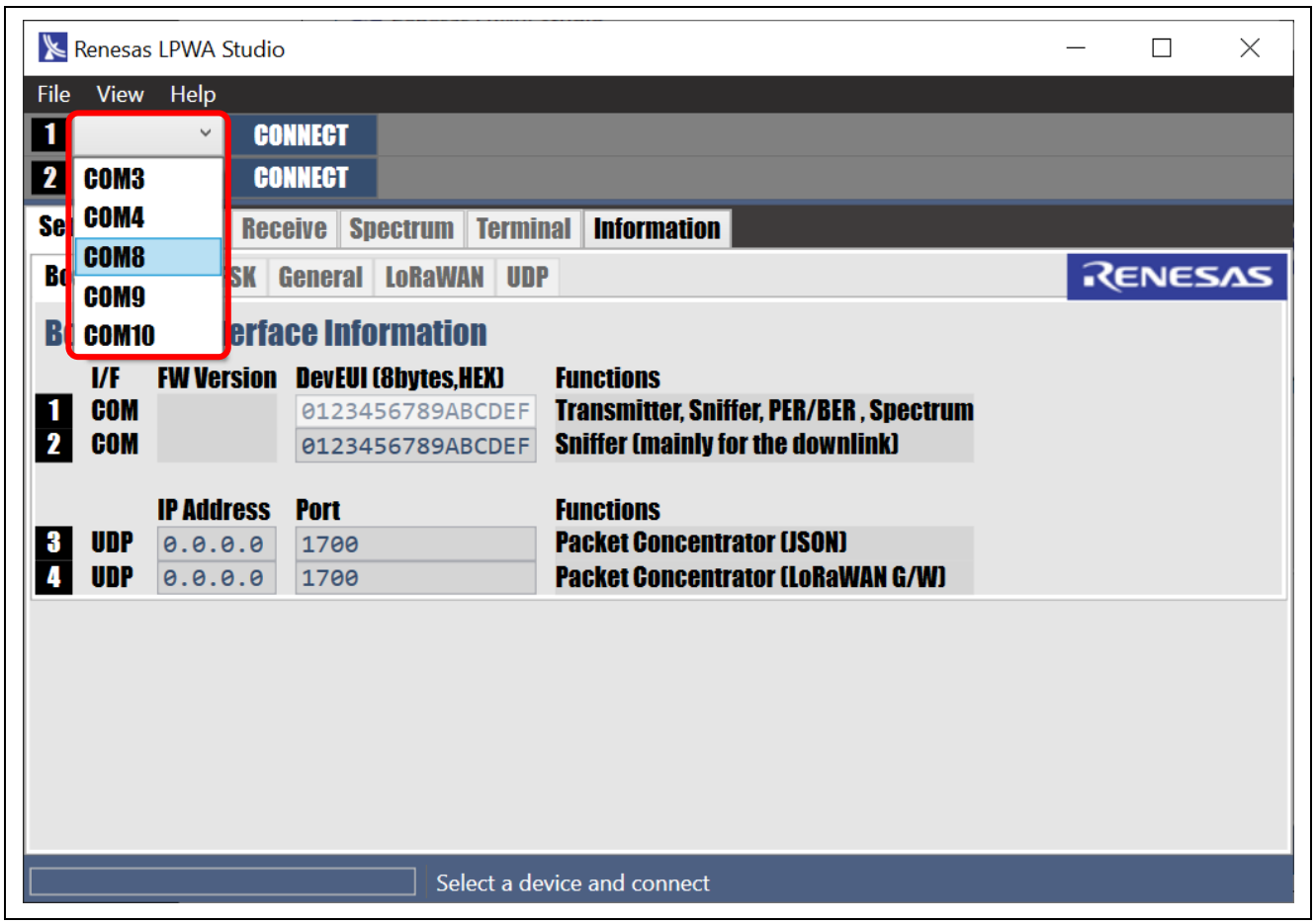

Figure 3. Connecting Radio Installation Program

Click **CONNECT**. If the connection is completed, the button will change to **DISCONNECT**.

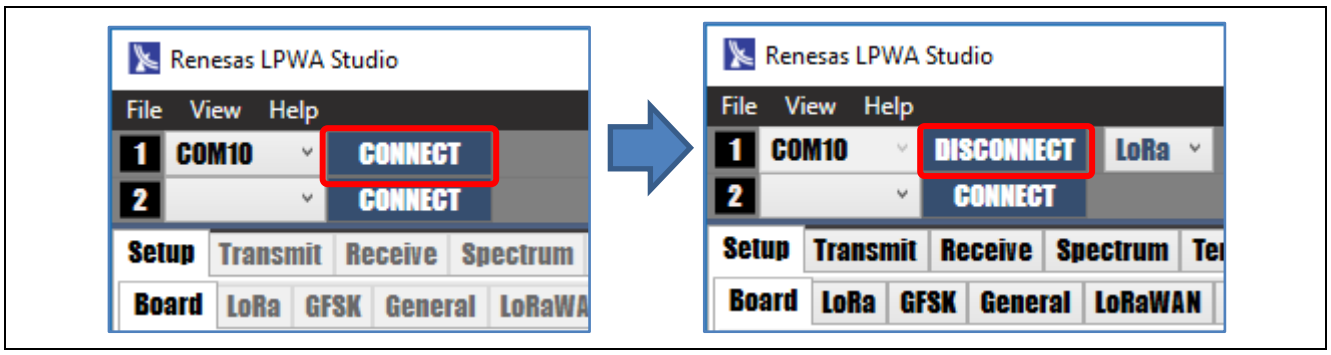

Figure 4. Connection and Disconnection Buttons

Click **DISCONNECT** to disconnect from the target board.

4.2 Select Modem, Frequency and Radio Parameters

1. Select Modem (LoRa or GFSK) from pulldown menu.
2. Select Frequency and Radio parameters described as below.

For **LoRa**: Spread Factor (**SF**), Coding Rate (**CR**), Band Width (**BW**), IQ Polarity (**IQ**)

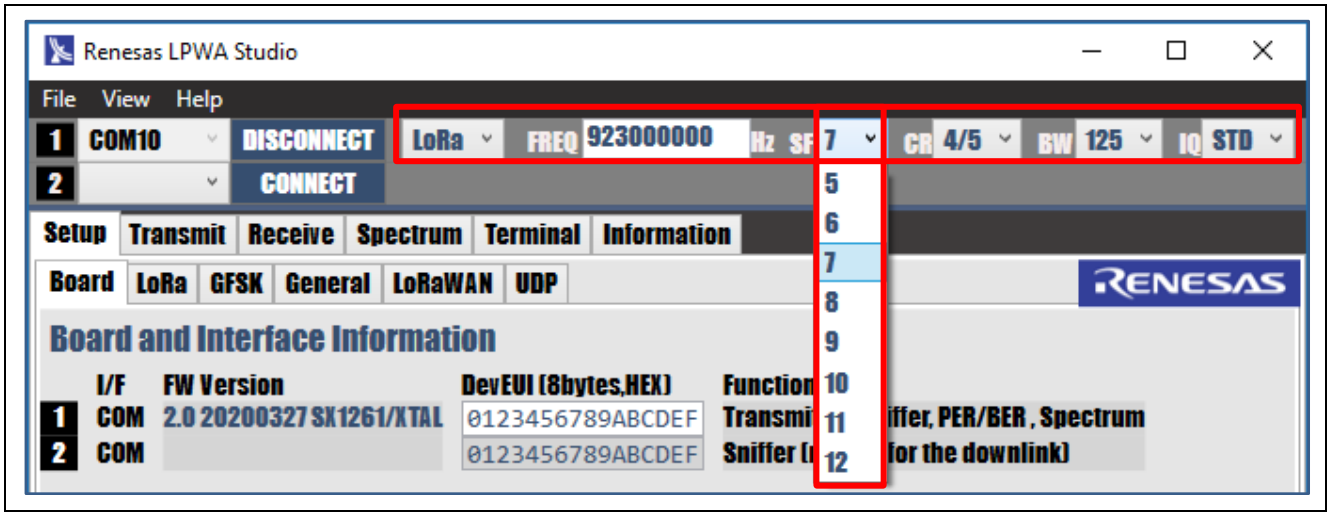

Figure 5. LoRa Parameters

For **GFSK**: Data Rate (**DR**), Frequency Deviation (**Fdev**), Band Width (**BW**)

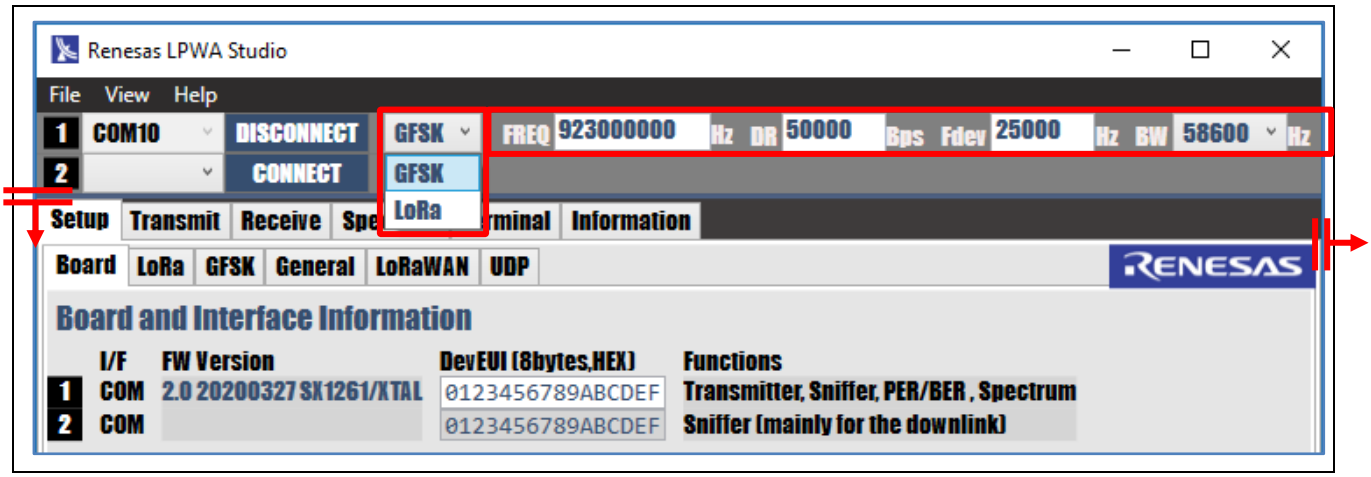

Figure 6. GFSK Parameters

Note: If you cannot find the DR/Fdev/BW field, please enlarge the window shown as above.

4.3 Configure Packet Parameters (optional)

Click **Setup** tab > Click **LoRa** or **GFSK** tab > Change packet parameters described as below.

Note: For more detail of each parameter, please refer to the Semtech SX1261/2 Datasheet.

For LoRa:

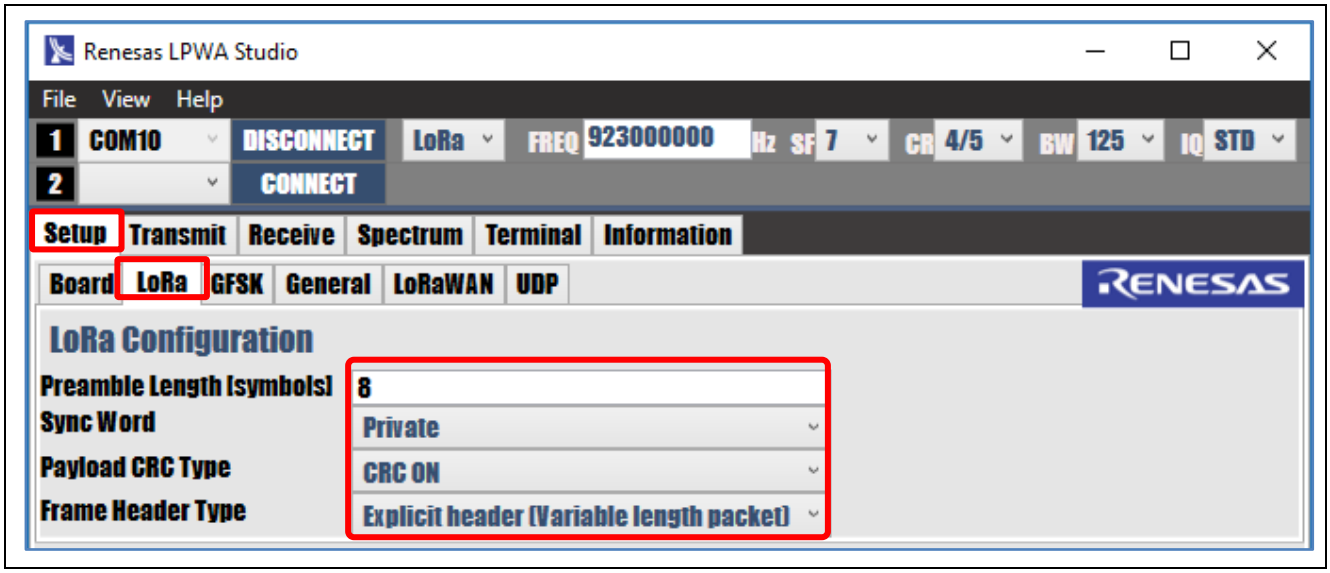

Figure 7. LoRa Packet Parameters Configuration

For GFSK:

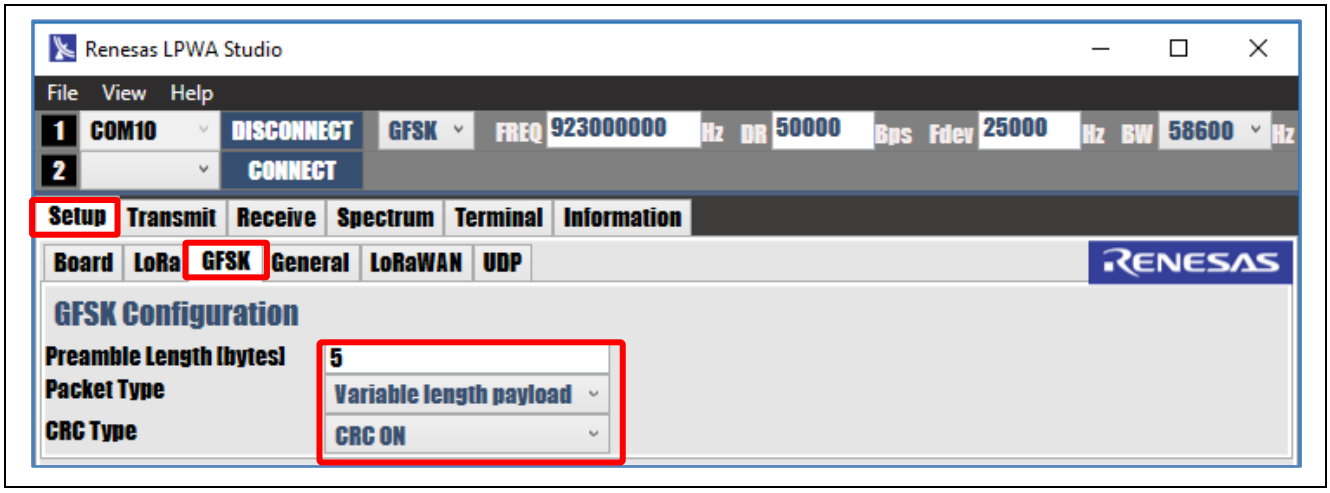

Figure 8. GFSK Packet Parameters Configuration

You can select **Boosted Gain**, enable the **LBT** (Listen Before Talk) and configure LBT parameters.

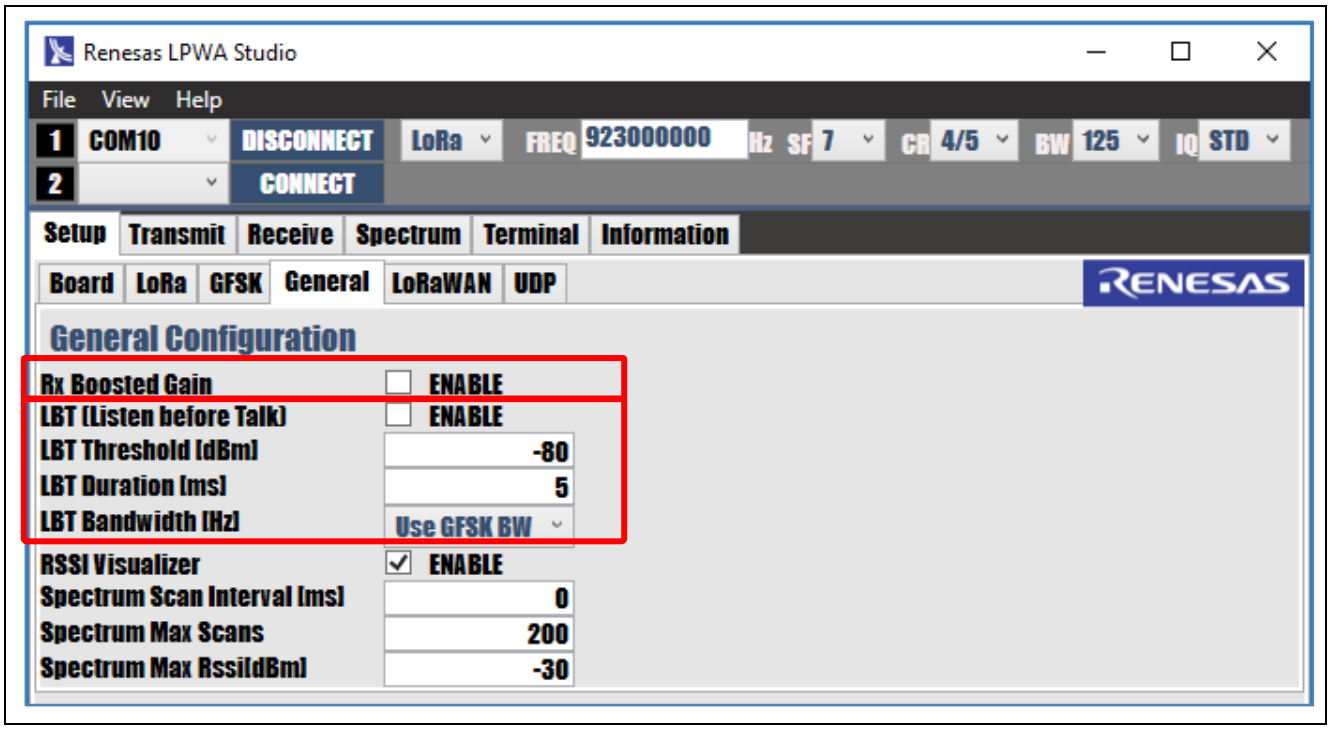

Figure 9. RX Boosted Gain and LBT Parameters Configuration

You can change the visualization settings on **SNIFFER/Spectrum** to improve performance.

If you enable the Sensor Data Visualizer, the received sensor values (Humidity and Temperature) will be plotted in the SNIFFER view.

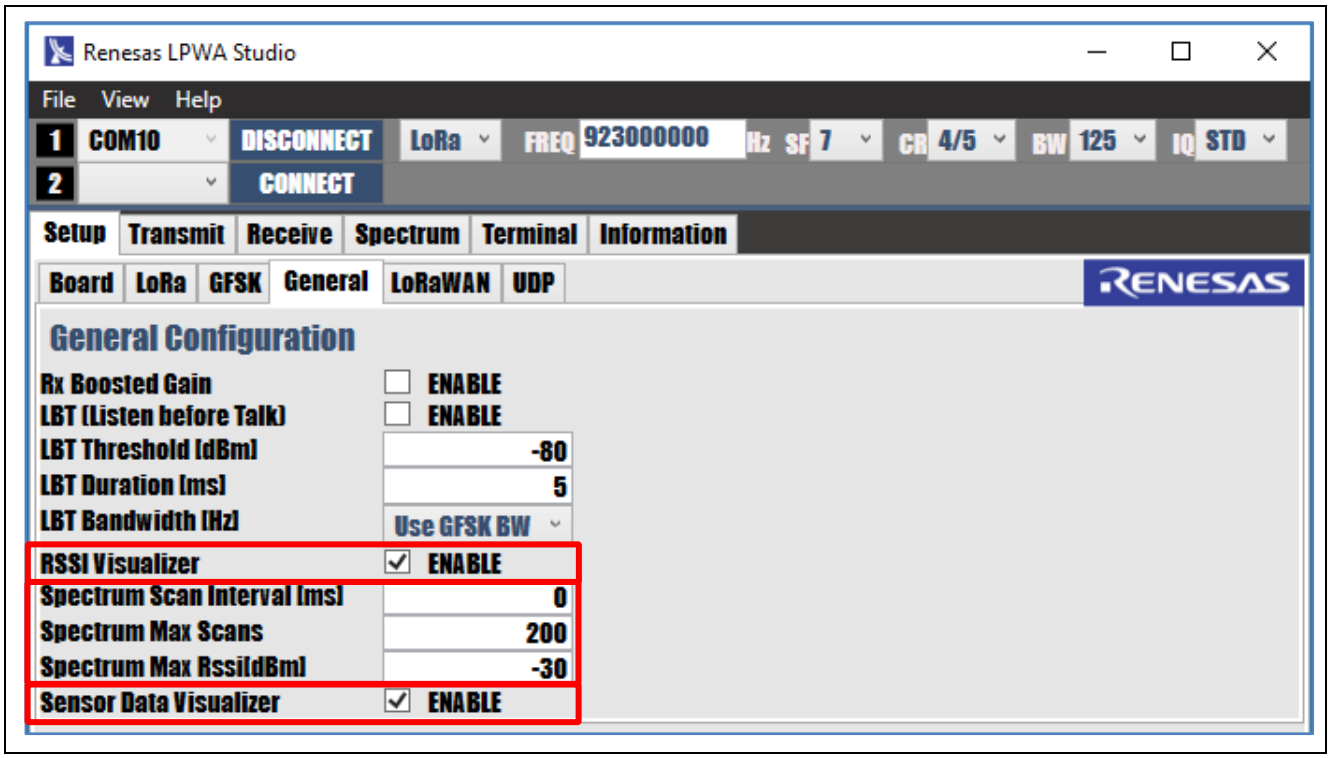

Figure 10. Sensor Data Visualizer

Note: You can reset all parameter and settings from **Menu**> **File**> **Reset All**.

4.4 Continuous Wave Transmission

[Operation]

- Click **Transmit** tab.
  - Select Continuous Wave Transmit and select Unmodulated or Modulated
  - Select Transmit Power > click START > Click STOP

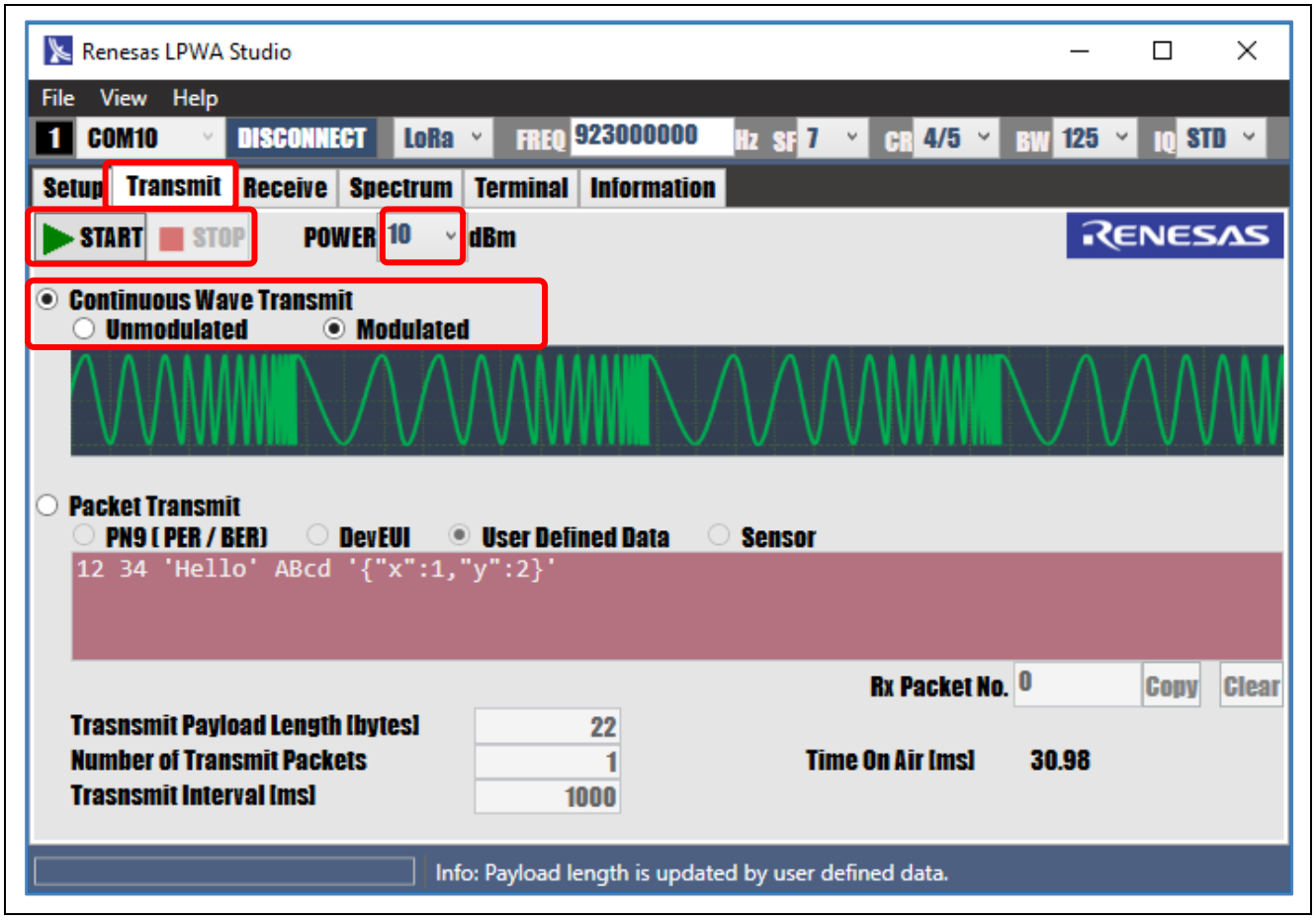

Figure 11. Continuous Wave Transmit Selection

Note: The data pattern in Modulated Wave is an infinite sequence of alternating ‘0’s and ‘1’s in **GFSK** modulation and preamble symbol in **LoRa**.

4.5 Packet Transmission

[Operation]

- Click **Transmit** tab
  — > Select transmit packet data **PN9 (PER/BER)**, **DevEUI,** or **User Defined Data**.
  — > Select Transmission Power, Payload Length, Number of Packets and Transmission Interval.
  — > Click **START** > click **STOP**

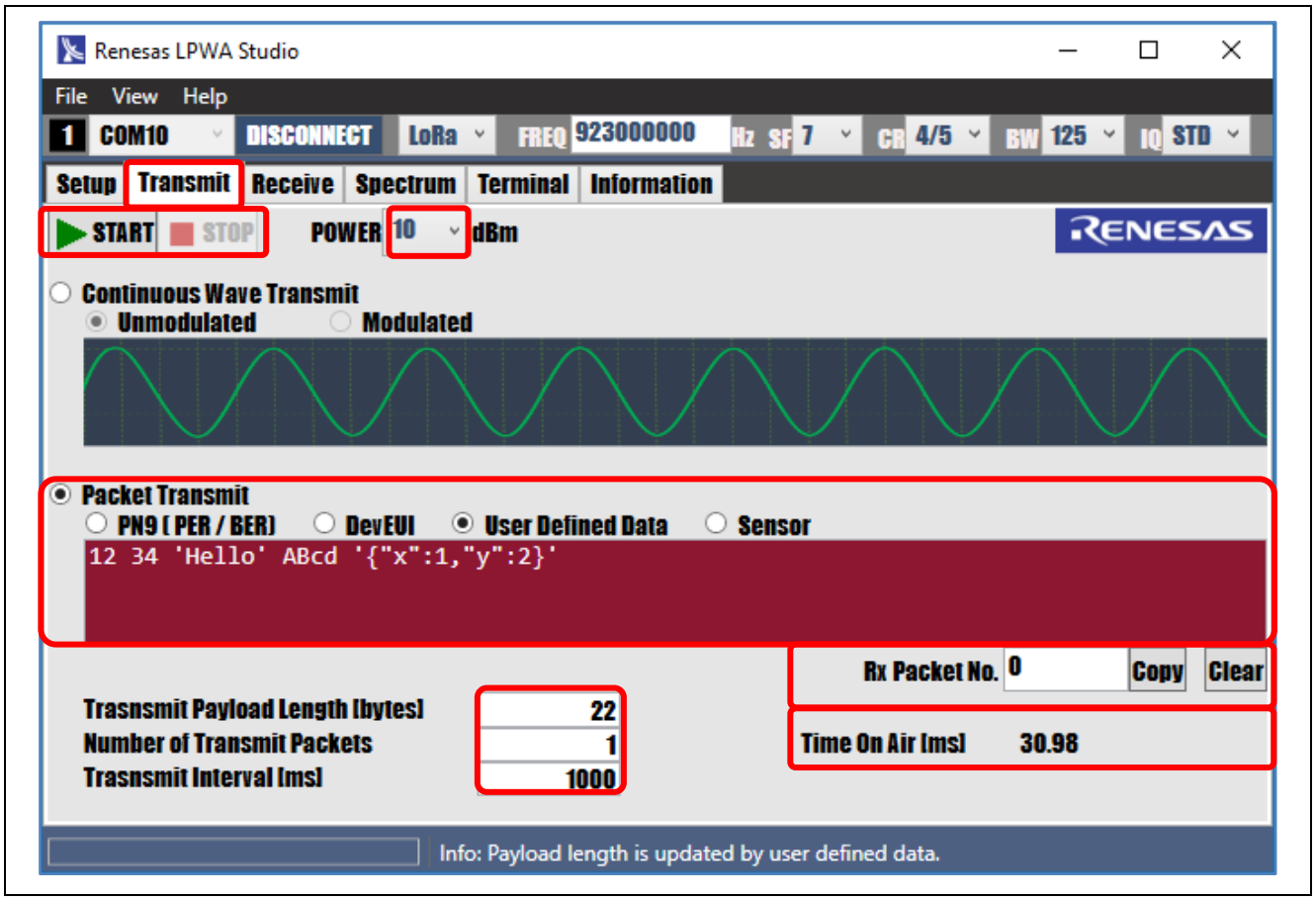

Figure 12. Packet Transmission Parameters

When you select **PN9 Data (PER/BER)**, special payload data will be transmitted. In **LoRa** mode, the payload is `"PER" + sequence number + PN9`. In **GFSK** mode, the payload is all 0 with data whitening.

When you select DevEUI mode, Pseudo JOIN frame containing DevEUI will be transmitted.

If you select User Defined Data mode, you can input transmission data in HEX (bytes) format or TXT (single quoted strings) format. You can Drag & Drop the data file (`.txt` or `.dat`). White space and carriage return are ignored. Transmission payload length is automatically calculated.

When you select Sensor mode, Sensor data `(lowest byte of DevEUI + Humidity(2bytes, uint16_t, 0.1%) +Temperature (2bytes, int16_t, 0.1°C)` will be transmitted. The transmission interval is the time from the end of the previous packet to the beginning of the next packet. In sensor mode, it should be at least 4 seconds.

By specifying the **Rx Packet No.** and clicking the **Copy** button, you can copy the transmission data from Received Packet list on SNIFFER (**Receive** tab).

Time on Air will be calculated automatically using current payload length and radio parameters.

4.6 SNIFFER (Packet Reception)

[Operation]

Select **Receive** tab > select **SNIFFER** mode > click **START** > click **STOP.**

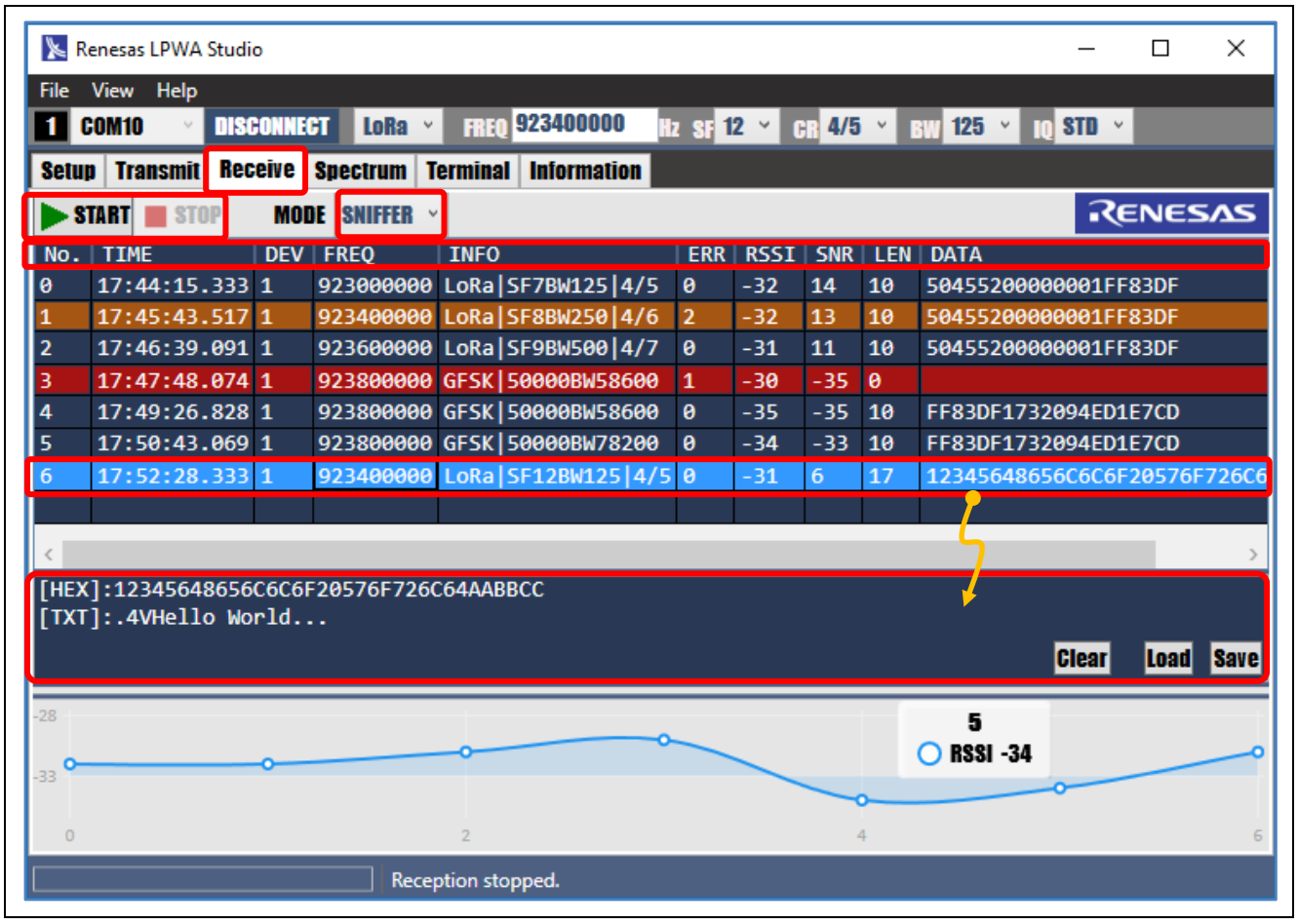

Figure 13. SNIFFER Mode

You can change the column order by dragging-and-dropping the column title (for example, “TIME”, “RSSI”,”DATA”), and you can also sort the data by clicking the column title. If you click the row, the packet payload data will be shown in the detail window in both `HEX` format and `TXT` format.

Click **Save** button. You can save the received packet in the packet log file with `JSON` format. Also, you can load the packet log file (`.json`) with Drag & Drop or **Load** button.

If you enable the RSSI visualization in **Setup** tab, the RSSI value will be plotted on the chart window in real-time. However, this feature will cause performance issues with large number of packets.

In **GFSK**, SNR is not supported by device, and so you should ignore the value on the **SNR** field.

Device number (“1” or “2”) and Interface number (“3” or “4”) are shown in the **DEV** field.

Packet error is shown in **ERR** field, 0: No error (clear), 1: CRC error (red), 2: Timeout (brown).

On RSSI chart, you can use the mouse wheel to zoon in/out, and use the mouse hold and drag for panning.

If you enable the Sensor Data Visualization in **Setup** tab, HS3001 Sensor values (Humidity and Temperature) will be plotted on the extra chart window in real-time.

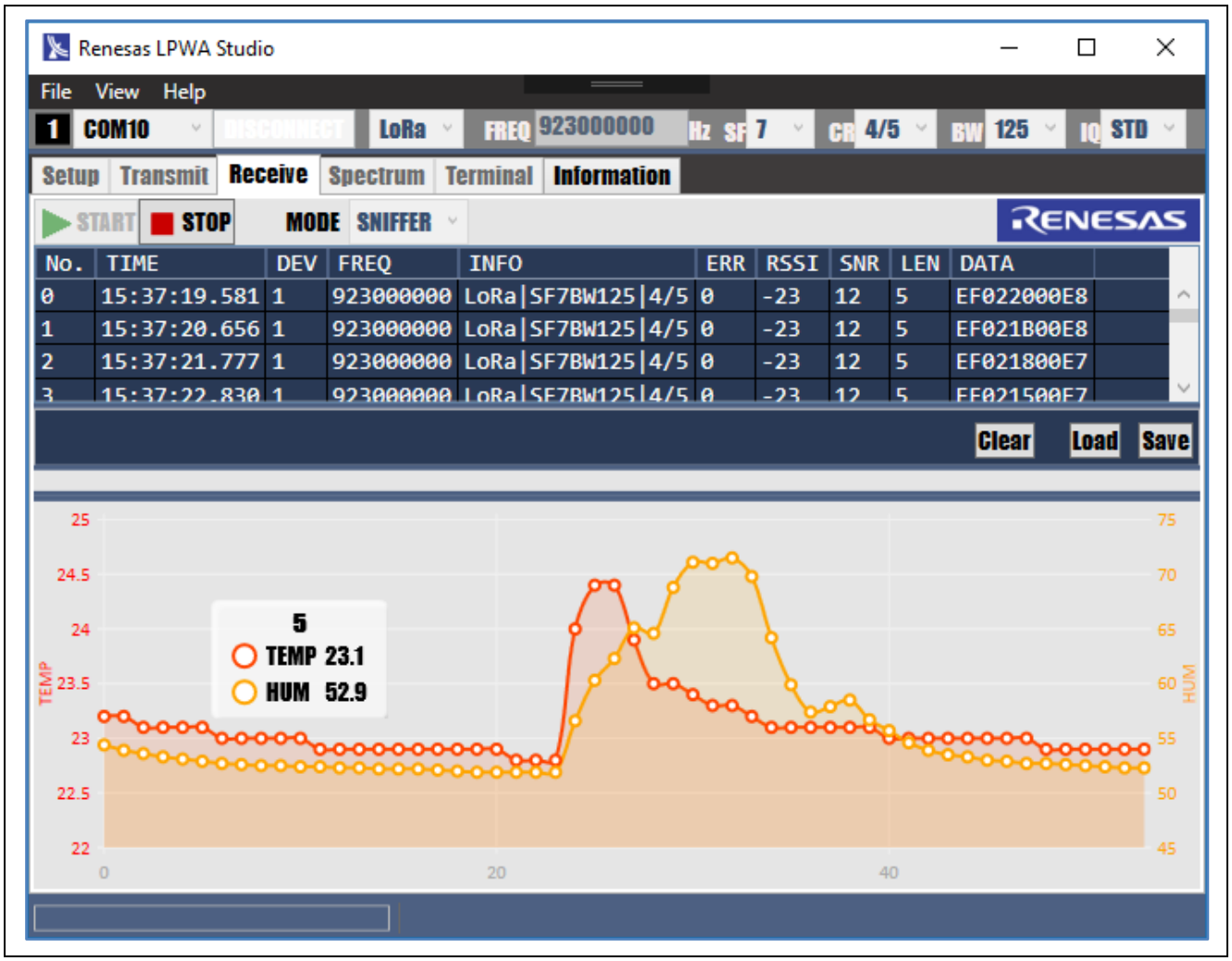

Figure 14. Sensor Data Visualization

Note: This function supports one sensor device only. When some sensor devices send the data, all received data will be plotted on the same chart unfortunately. If you need to display the sensor values on a sensor-by-sensor basis, some external tools (for example, Python/influxDB/Grafana) are required. Renesas LPWA Studio can interface to these external tools with UDP packet forwarding function. For more detail, please refer to the Advanced Section.

4.7 PER/BER Test

[Preparation]

Before PER/BER testing, you should set the same parameters in both transmitter side and receiver side.

Parameter means Modulation Parameter (for example, Modulation, Frequency, Data Rate, Spread Factor, and so on) and Packet Format Parameter listed in the **Setup** tab (for example, **Preamble Length**, **Sync Word**, **Payload CRC Type**, **Frame Header Type**, and so on). Recommended settings are shown below.

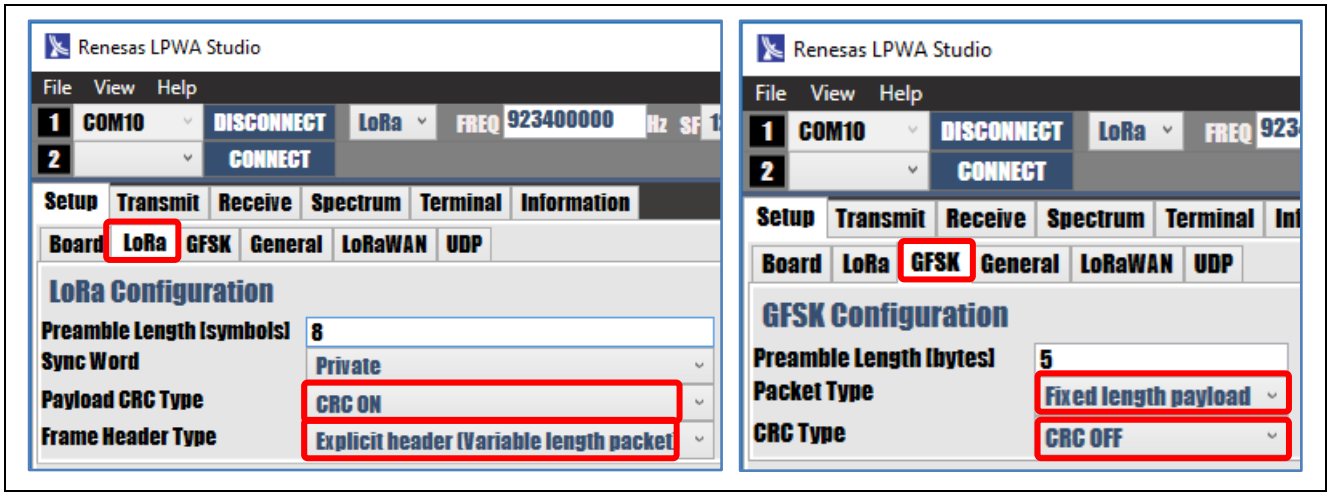

Figure 15. Setting LoRa and GFSK Configuration Parameters for PER/BER Testing

[Operation]:

Select **PN9 Data for PER/BER** on transmitter side and **PER/BER** mode on receiver side.

- Set the same settings (for example, number of packets) on both transmitter side and receiver side.
- Start receiver side > start transmitter side > stop receiver side after transmission is completed.
  After stopping the reception, the PER/BER and reception statistics are displayed automatically.

Note1: **LoRa** mode supports PER only, **GFSK** mode supports both PER and BER.
Note2: In **GFSK**, **Expected Data Length** field is displayed and **SNR** field is disabled.

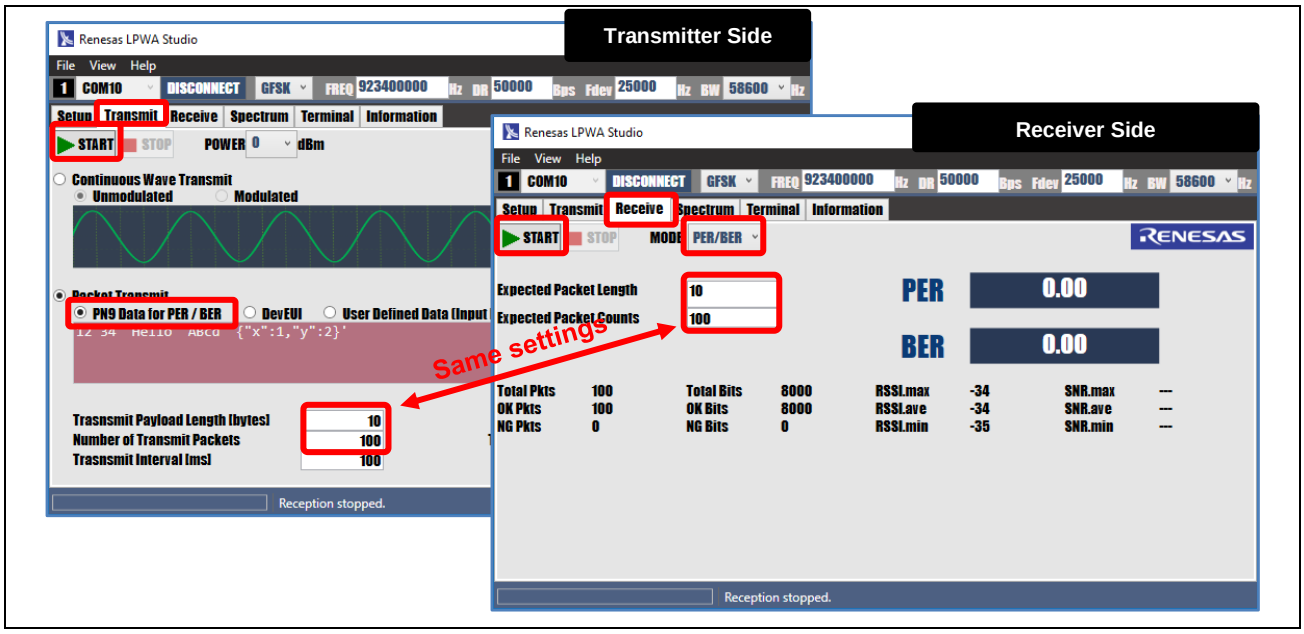

Figure 16. Transmitter and Receiver Side Settings

4.8 Spectrum Scan

[Operation]

Click **Spectrum** tab > Set **BEGIN/END/STEP** frequency and **Scan** view > click **START**.

Once started, the spectrum scan will automatically stop when the scan reaches the “Max Scans”.

Note: **GFSK** mode is required for spectrum scanning. Before you start, select **GFSK** mode.

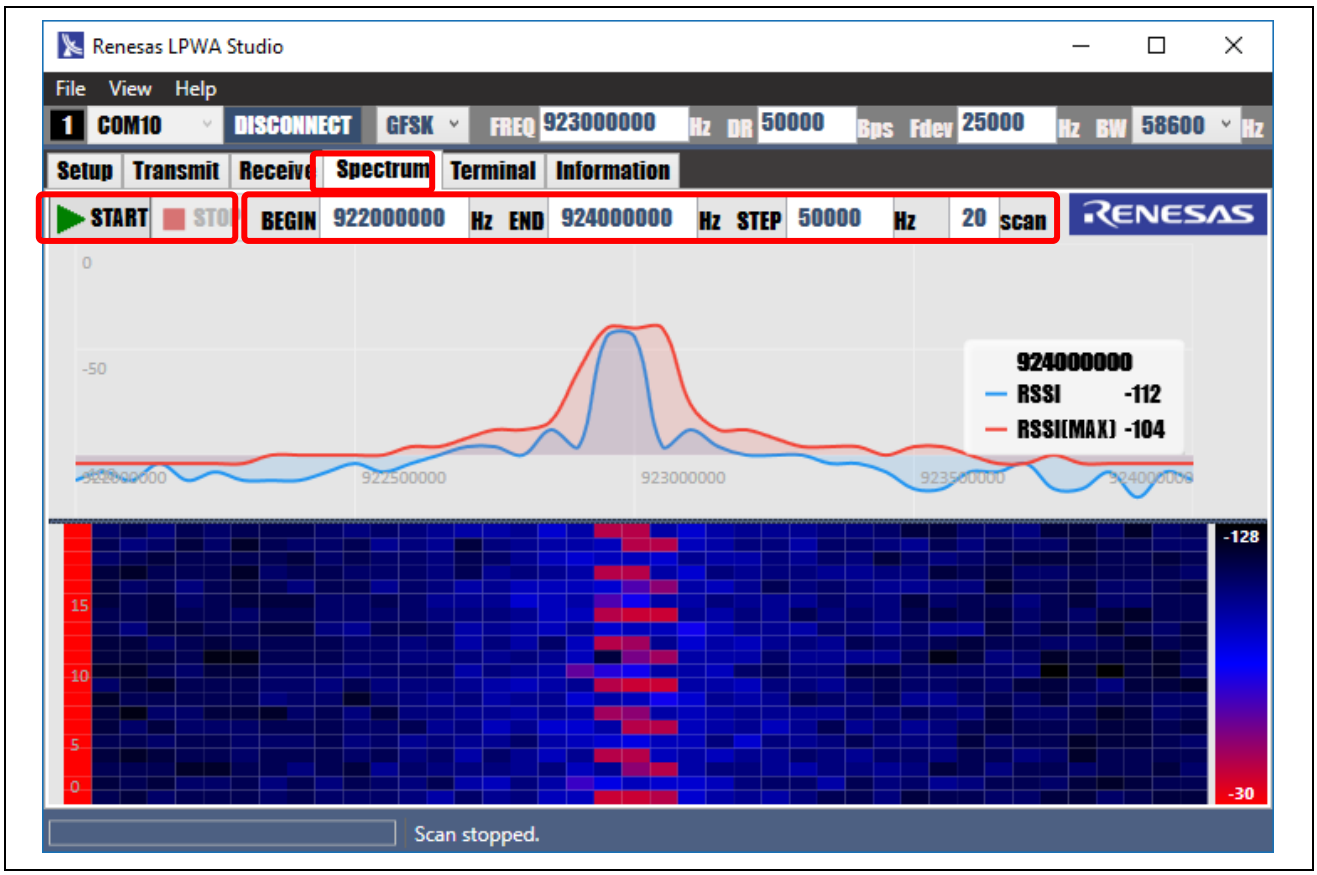

Figure 17. Spectrum Scan

Note: To prevent performance issues, maximum number of the scan is limited as shown below:

```
(END-BEGIN) / STEP <= 200[plot/line], and (END-BEGIN)/STEP * scan lines <= 5000
[plot]
```

If you disable RSSI visualizer on the **Setup** tab, the Data Grid will be displayed instead of the Heat Map.

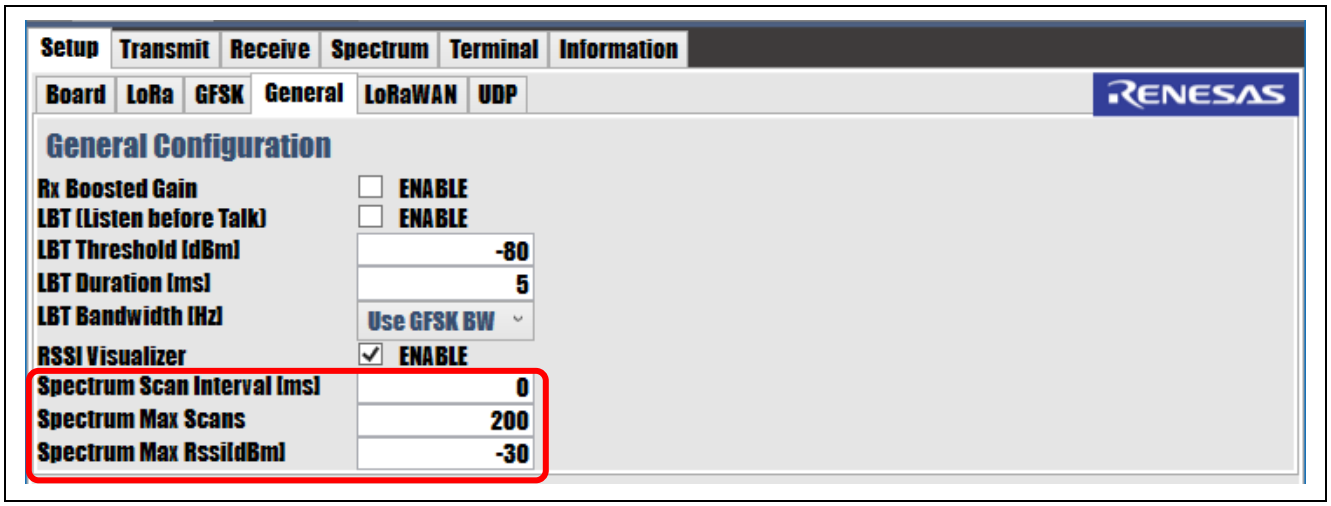

Figure 18. Spectrum Scan Data

Note: If the current Rssi exceeds the **Max Rssi** parameter, all plotted data will be updated to redraw.

4.9 Information

The following screen capture shows the LoRa-based solution information that can be accessed from the Renesas LPWA Studio window.

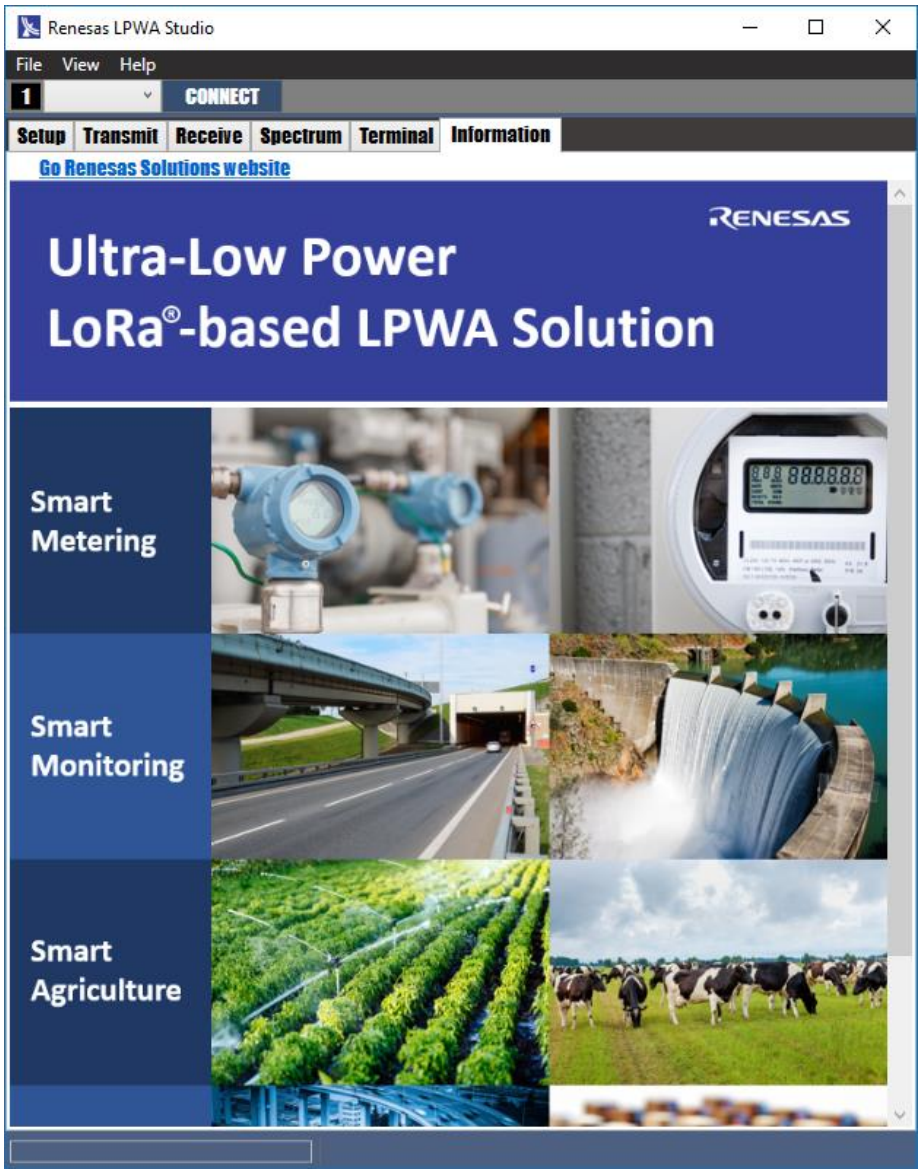

Figure 19. LoRa-based LPWA Solution Information

5. Using Renesas LPWA Studio [Advanced]

5.1 Terminal

[Operation]

Click **Terminal** tab > Input AT Commands (no need input prefix “AT+”).

For details on the commands, please see the *Radio Evaluation Program Application Note*.

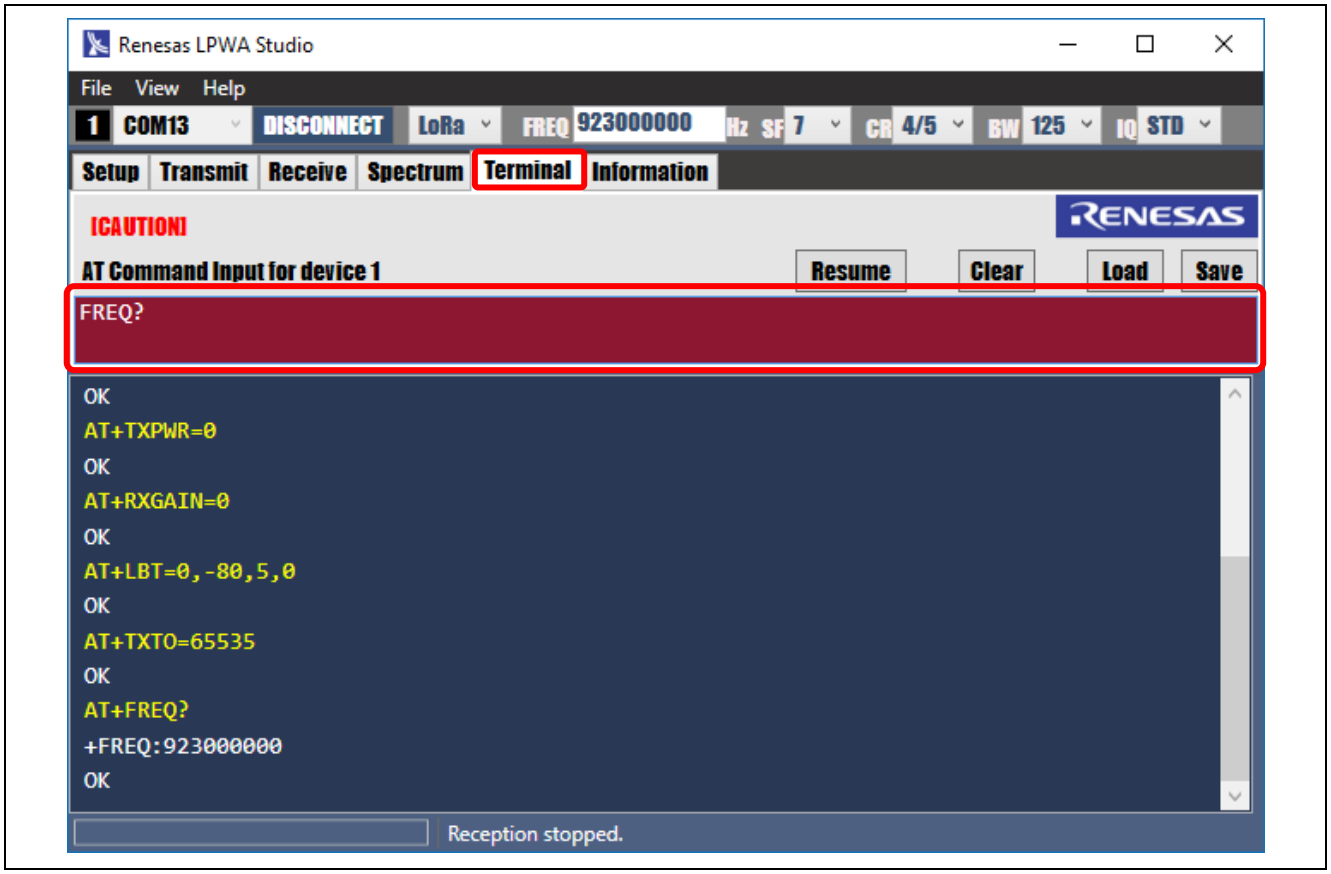

Figure 20. Terminal View

Note: AT Command will cause parameter mismatch between GUI and CUI. After changing the parameters, you can initialize the parameter with GUI parameter by clicking **Resume**.

You can browse the command line history using up and down arrow keys.

Save Command log: Click **Save** to store all command log to the text file.

Load Command script: Click **Load** or **Drag & Drop** to run the command script file (`.txt` or `.cmd`).

```
// Sample Script
AT+MODEM=1              // LoRa Modulation
AT+FREQ=923400000       // Frequency 923.4MHz
AT+TXPWR=10             // Transmission Power 10 dBm
AT+TXCP                 // Start continuous modulated wave transmission
@wait 5000              // wait 5000 ms
```

Figure 21. Script Example

5.2 Capturing the LoRaWAN Packets

Renesas LPWA Studio supports the following four ways to capture the LoRaWAN packets.

Case 1: Dual target board with USB serial (Single channel capture)

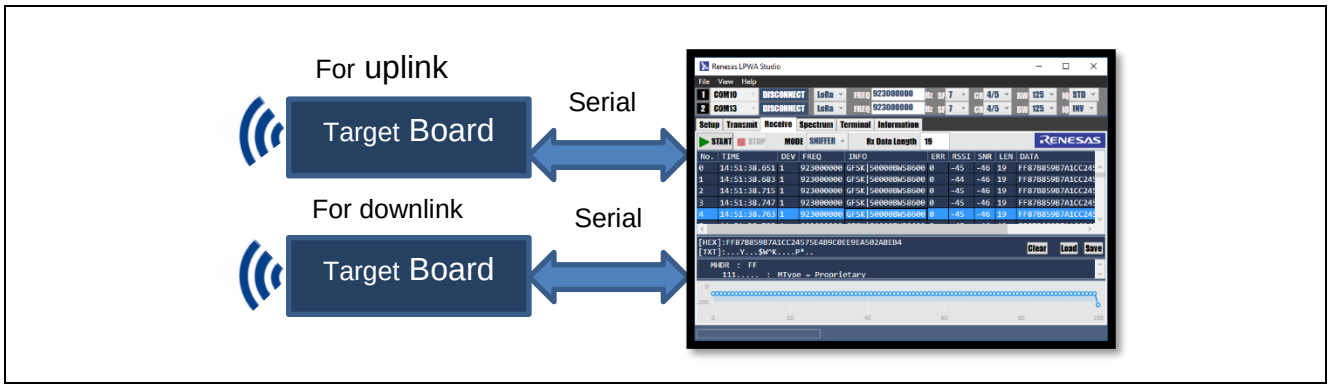

Figure 22. Two Target Boards with Serial USB (Single Channel Capture)

Case 2: Multiple Renesas LPWA Studio (Multi channel capture)

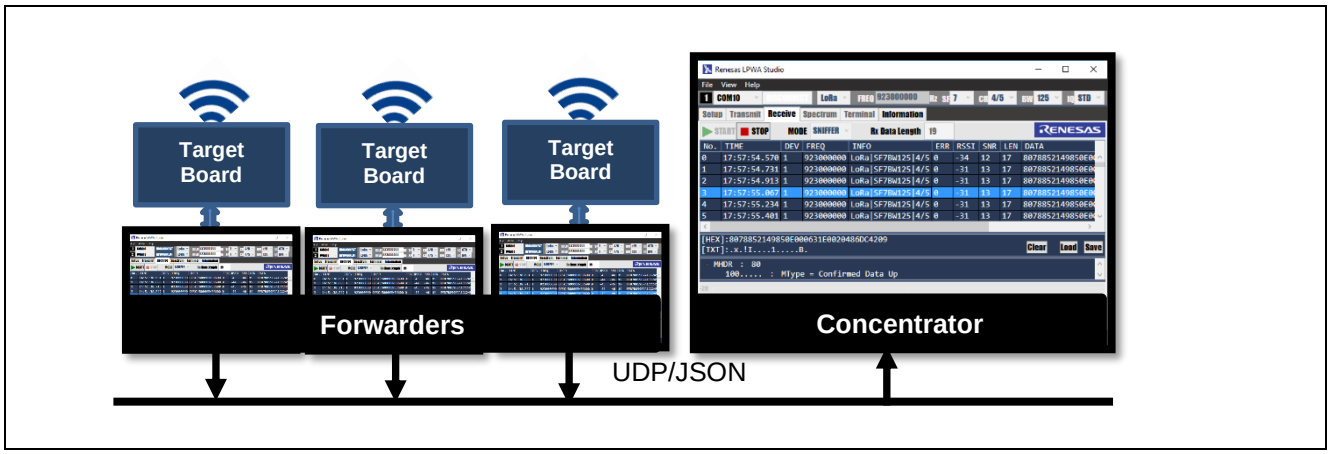

Figure 23. Multiple Target Boards (Multi Channel Capture)

Case 3: Semtech Packet Forwarder (max 8 channel capture)

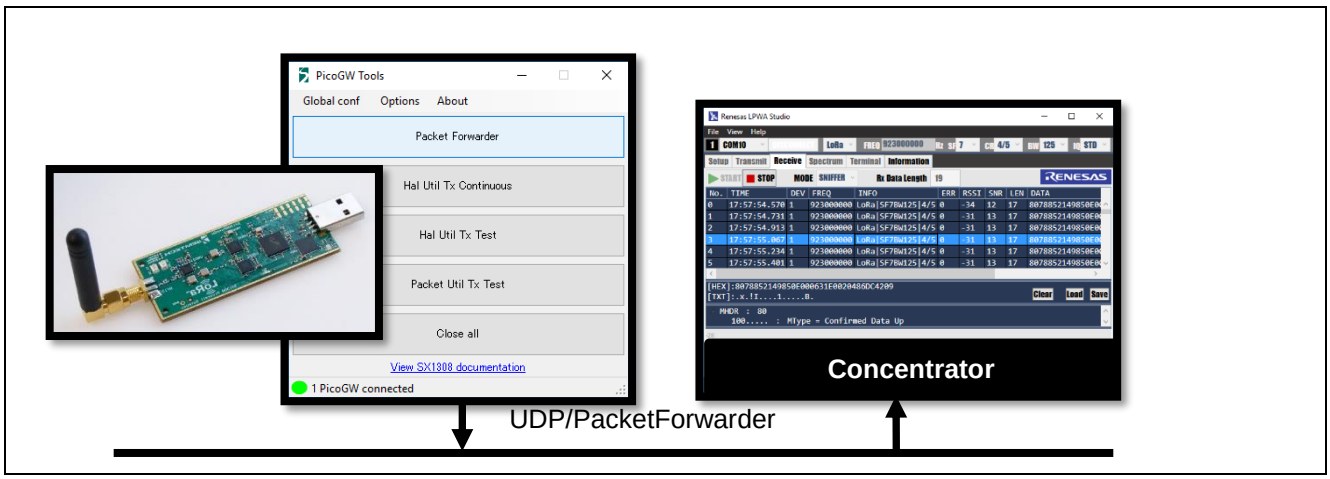

Figure 24. Semtech Packet Forwarder (Maximum of 8 Channels Capture)

Case 4: Combination of above cases 1 to 3.

5.2.1 Case 1 Dual Target Board

In LoRaWAN with LoRa modulation, uplink and downlink are of different IQ polarity. Uplink is Standard IQ (non-inverted) and Downlink is Inverted IQ. Therefore, you should open two devices.

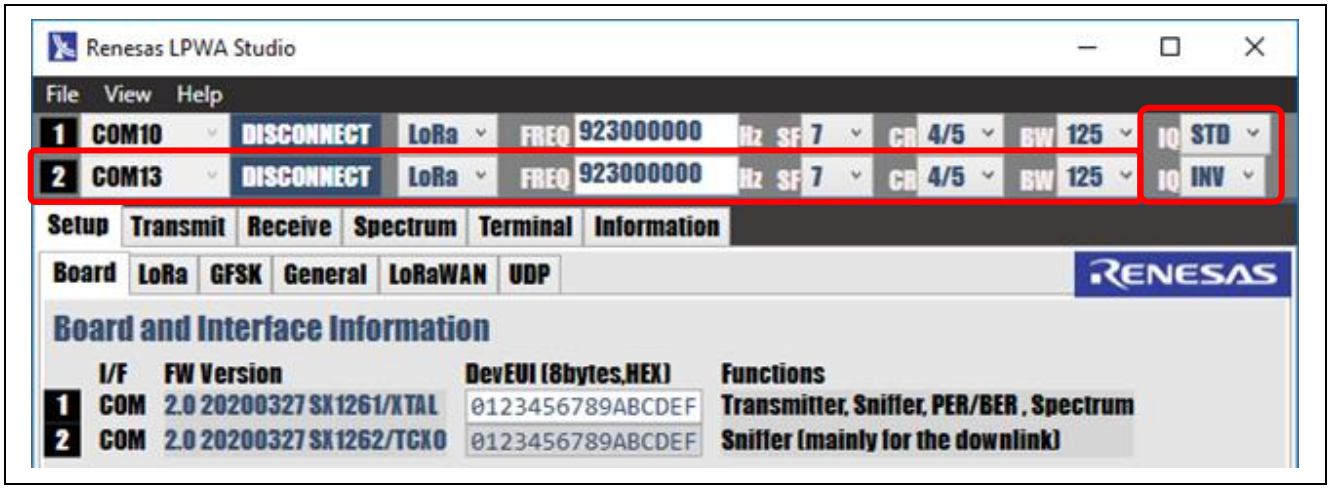

Figure 25. Two Target Boards Case 1

5.2.2 Case 2 Multiple Renesas LPWA Studio

Renesas LPWA Studio can forward and concentrate the received packets via the UDP port. The same UDP port settings are required on both forwarder side and concentrator side described as below.

IMPORTANT: Enable the concentrator first, then enable the forwarder. Once you have enabled the concentrator, you cannot disable it until you exit the program.

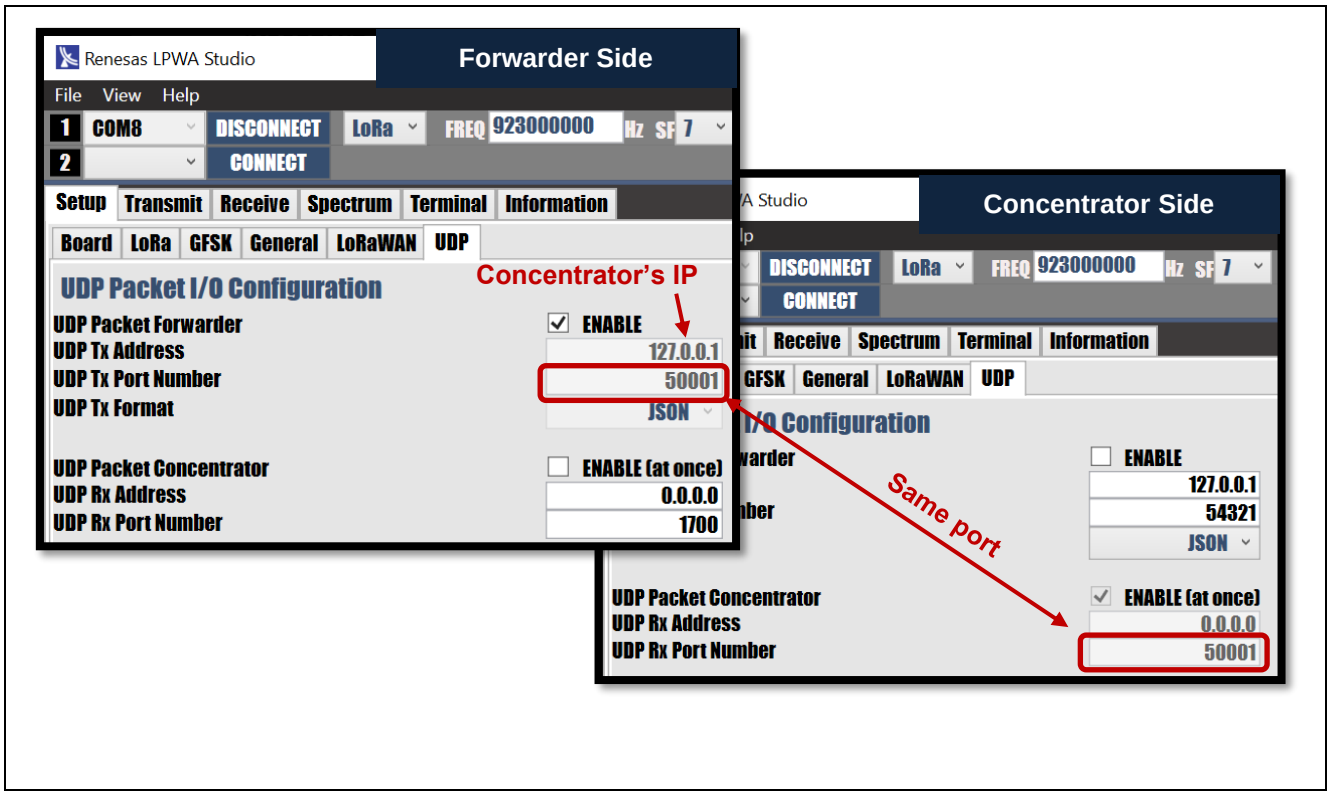

Figure 26. Multiple Target Boards Case 2

5.2.3 Case 3 Semtech Packet Forwarder

Renesas LPWA Studio can capture the PUSH_DATA packets sent by Semtech Packet Forwarder and display on the SNIFFER view. The same UDP port settings are required both forwarder side (Semtech Packet Forwarder. For example, Semtech PicoCell Gateway) and concentrator side (Renesas LPWA Studio) described as below.

NOTE: For more detail of the Semtech Packet Forwarder's PUSH_DATA packet format, Please refer to https://github.com/Lora-net/picoGW_packet_forwarder/blob/master/PROTOCOL.TXT

IMPORTANT: Enable the concentrator (Renesas LPWA Studio) first, then start the forwarder (GW). Once you have enabled the concentrator, you cannot disable it until you exit the program.

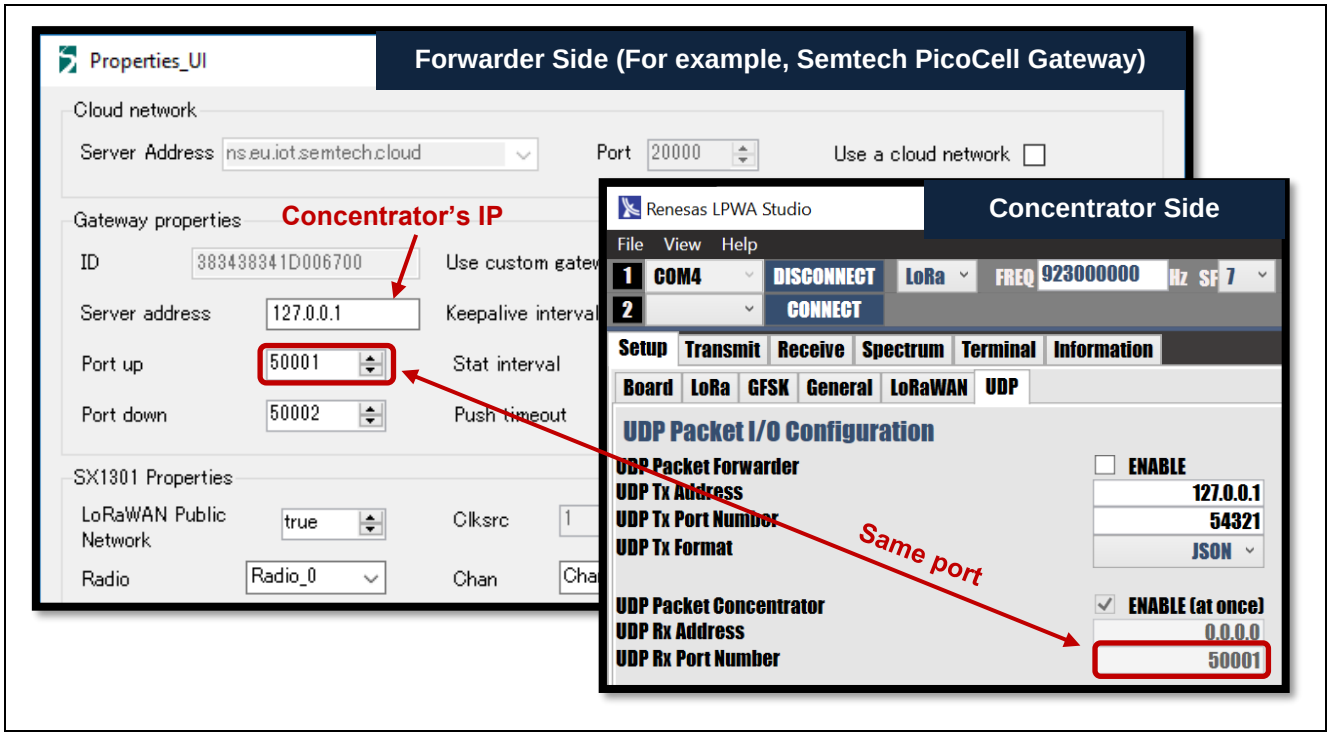

Figure 27. Semtech Packer Forwarder Case 3

5.3 Built-in LoRaWAN Decoder

Built-in LoRaWAN decoder can decode and decrypt the LoRaWAN (v1.0.3/v1.0.4) class A/B/C frames.

Note : LoRaWAN v1.0.3 Class B Beacon frame format is region specific. Built-in LoRaWAN decoder supports only AS923/EU868/KR920/US915.

[Operation]

To enable the built-in LoRaWAN decoder, click **Setup** tab > click **LoRaWAN** tab > **Enable LoRaWAN Packet Decoder**.

If the following security keys are set, LoRaWAN decoder will try to decrypt a LoRaWAN MAC payload.

AppKey is required for OTAA (Over-The-Air-Activation), and both **NwkSKey** and **AppSKey** are required for ABP (Activation-By-Personalization). **GenAppKey** are required to decrypt a Multicast LoRaWAN frame.

LoRaWAN decoder supports Application Layer Clock Synchronization Protocol, Remote Multicast Setup Protocol and Fragmented Data Block Transport Protocol to decode FUOTA V1.0.0 / V2.0.0 transaction.

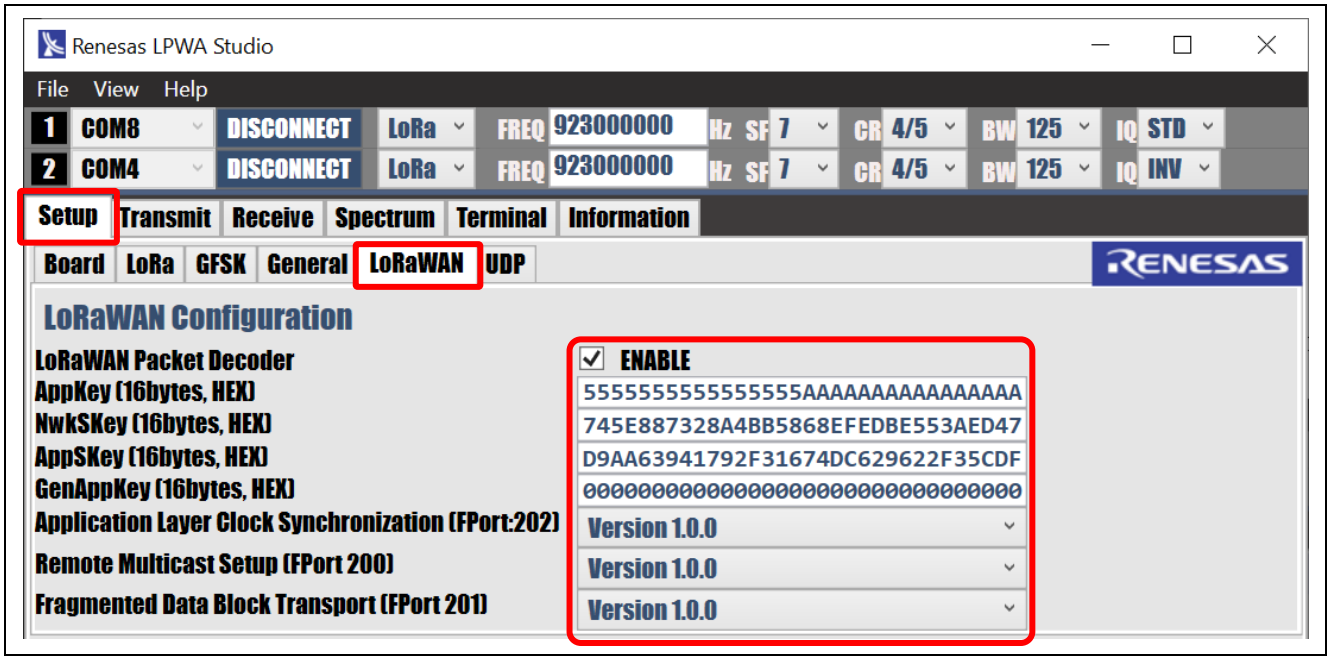

Figure 28. Enabling Built-in LoRaWAN Decoder

Note1: **NwkSKey** and **AppSKey** will be updated by clicking the valid JOIN Request Packet and corresponding valid JOIN Acknowledge Packet on the SNIFFER.

Note2: Multicast Groups, Address and Session Keys (McAppSKey and McNwkSKey) will be updated by clicking the valid Remote Multicast Setup Packet (McGroupSetupReq) on the SNIFFER.

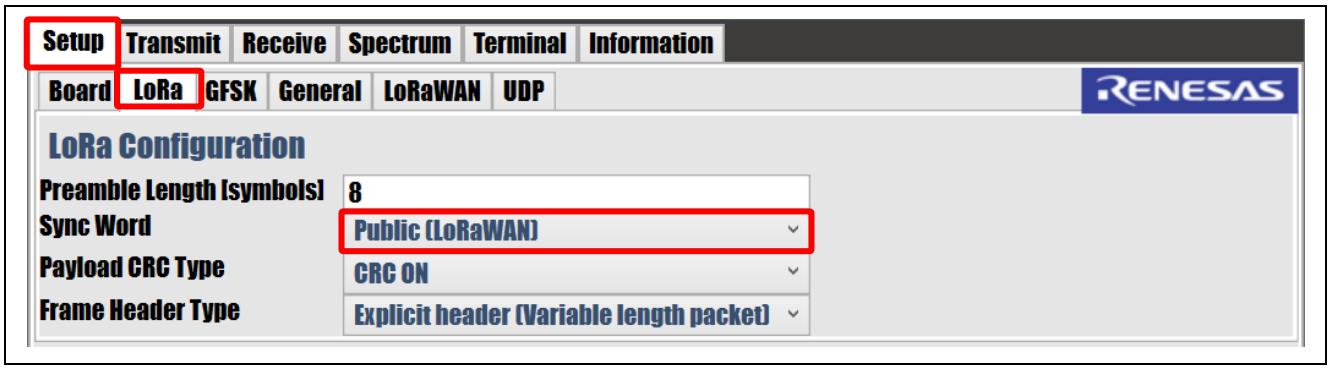

Figure 29. Setting LoRa Sync Word to Public

If you want to capture LoRaWAN compliant packets, you must set the LoRa Sync Word to **Public**.

Click **Receive** tab > Select **SNIFFER** mode > **Start** Capture > Select received LoRaWAN packet.

Then, the decoded and decrypted LoRaWAN packet will be displayed as shown below.

If you want to save the decoded single frame to the file (JSON format), Click **Clip** button.

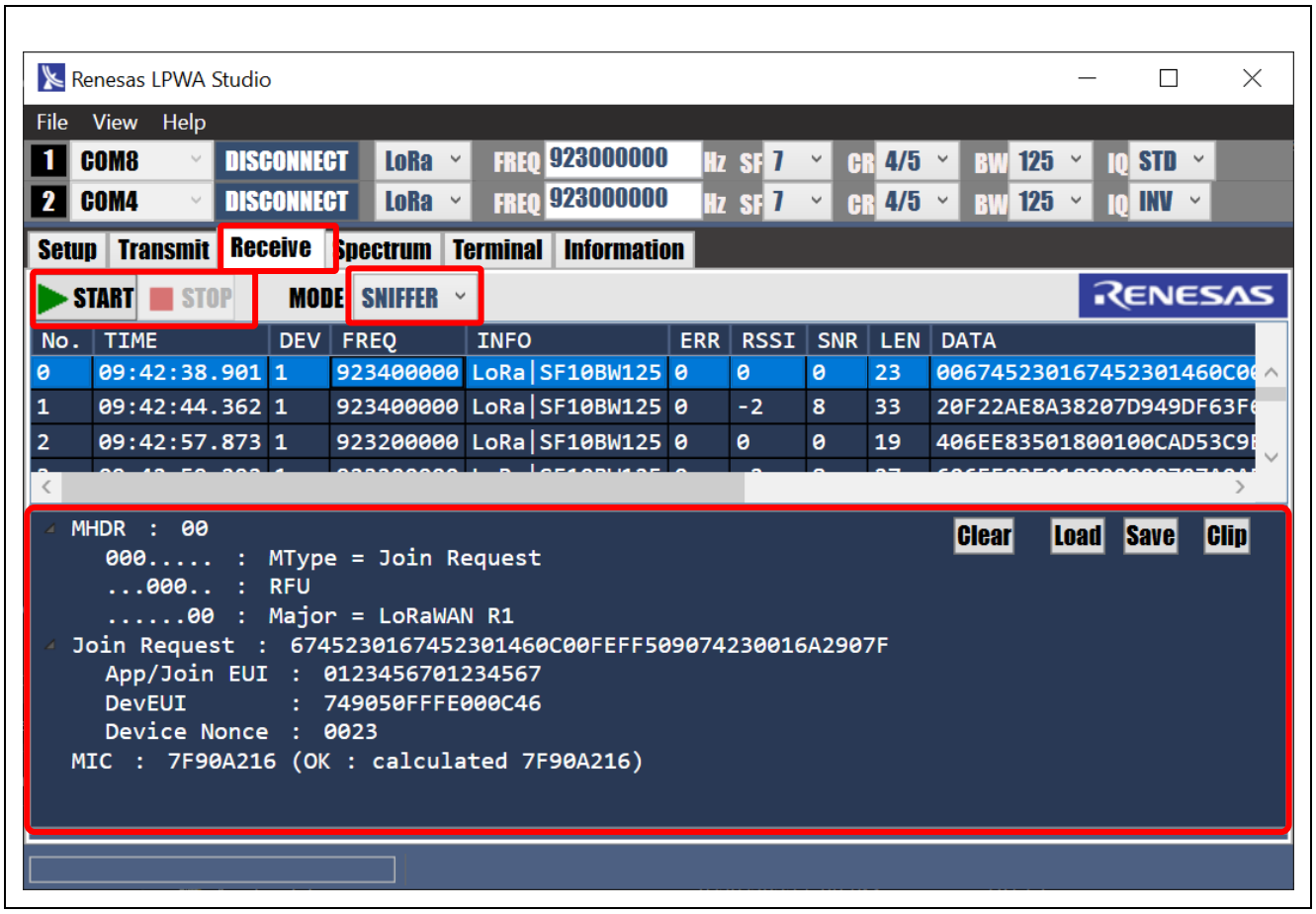

Figure 30. Displaying the Received LoRaWAN Packet

For more details, please refer to the LoRaWAN Specification at the following link:

[Technical Specifications (lora-alliance.org)]

5.4 Packet Forwarder

Renesas LPWA Studio supports two ways to forward the received packets to the external programs.

Case 1: Wireshark

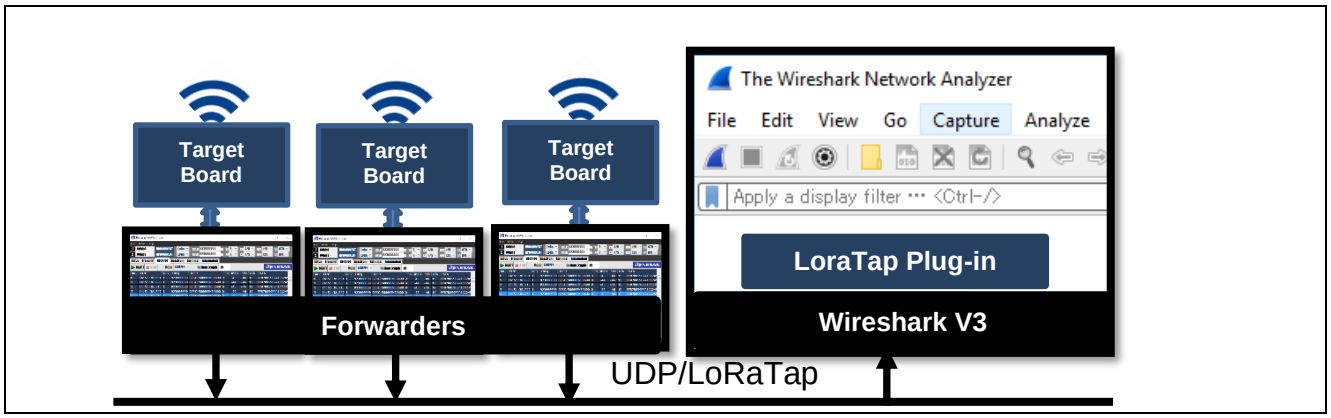

Figure 31. Forwarding the Received LoRaWAN Packets (Wireshark)

Case 2: External Applications

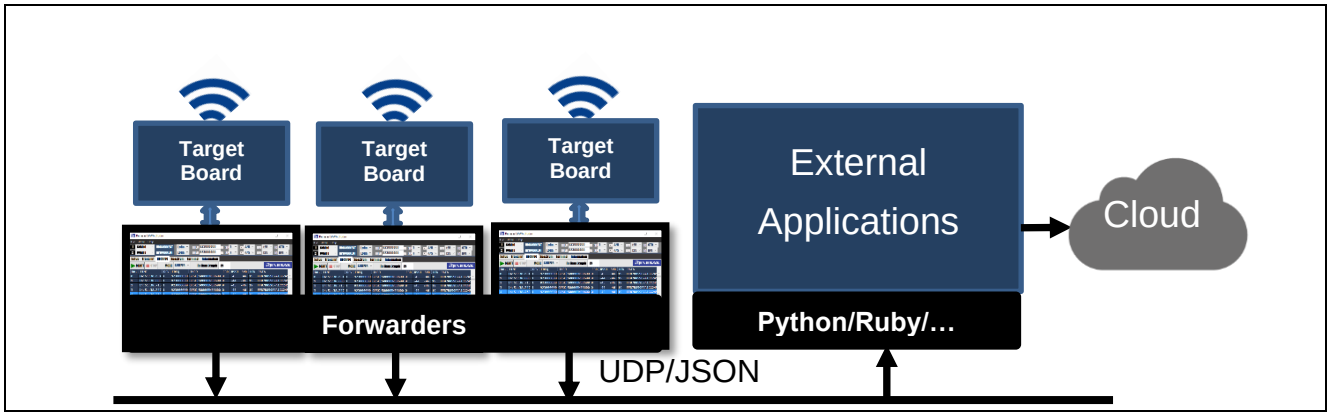

Figure 32. Forwarding the Received LoRaWAN Packets (External Applications)

5.4.1 Case 1: Wireshark

[Preparation on Wireshark]

Download and install latest builds of Wireshark V3.x.x (64-bit) or later from following download site:

https://www.wireshark.org/#download

Copy `loratap_over_udp.lua` script to following Wireshark plugin directory.

```
C:\Program Files\Wireshark\plugins\3.x\epan\
```

You can find `loratap_over_udp.lua` in the release package (`\samples\tools\RLPWAStudio`)

[Preparation on Renesas LPWA Studio]

Click **Setup** tab > Click **UDP** tab > Configure **UDP Packet Forwarder** as follows.

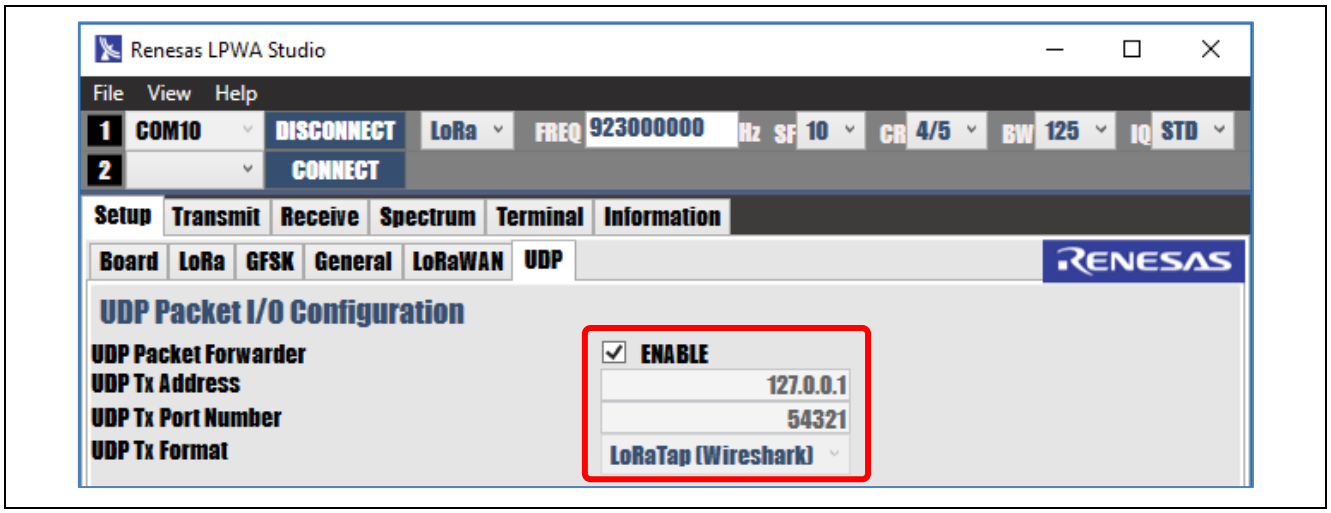

Figure 33. Configuring the UDP Packet Forwarder for Wireshark

Note: Default IP address `127.0.0.1` is loopback IP address. Wireshark V3.0 or later can capture loopback interface. If you change port number `54321` to another port number, you should edit `loratap_over_udp.lua` script and replace port number `54321` to new port you specified.

[Operation]

Renesas LPWA Studio: Click **Receive** tab > Select **SNIFFER** > click **Start**

Wireshark: Set **udp port 54321** as capture filter > Select **Adapter for loopback traffic capture** > Start capture.

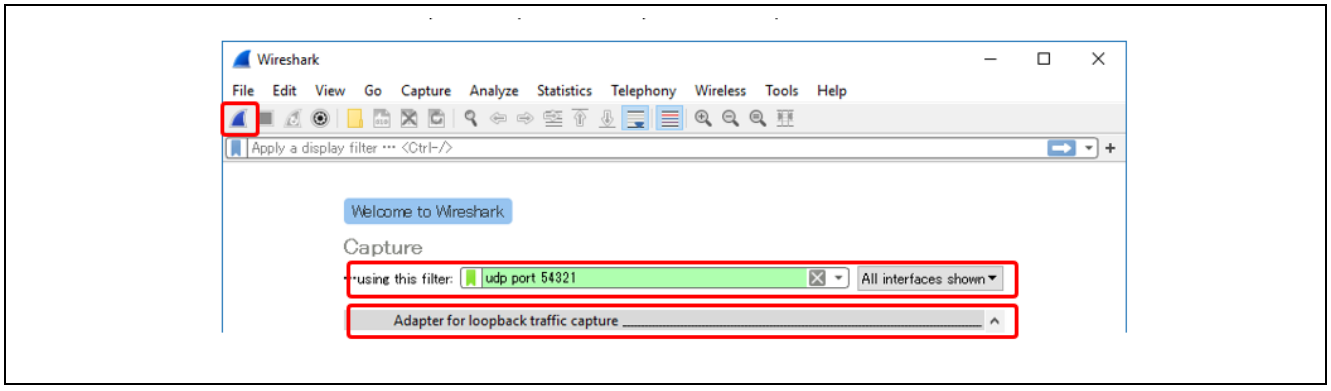

Figure 34. Using Wireshark for Packet Forwarding

5.4.2 Case 2: External Programs

[Preparation on Renesas LPWA Studio]

Click **Setup** tab > Click **UDP** tab > Configure **UDP Packet Forwarder** as follows.

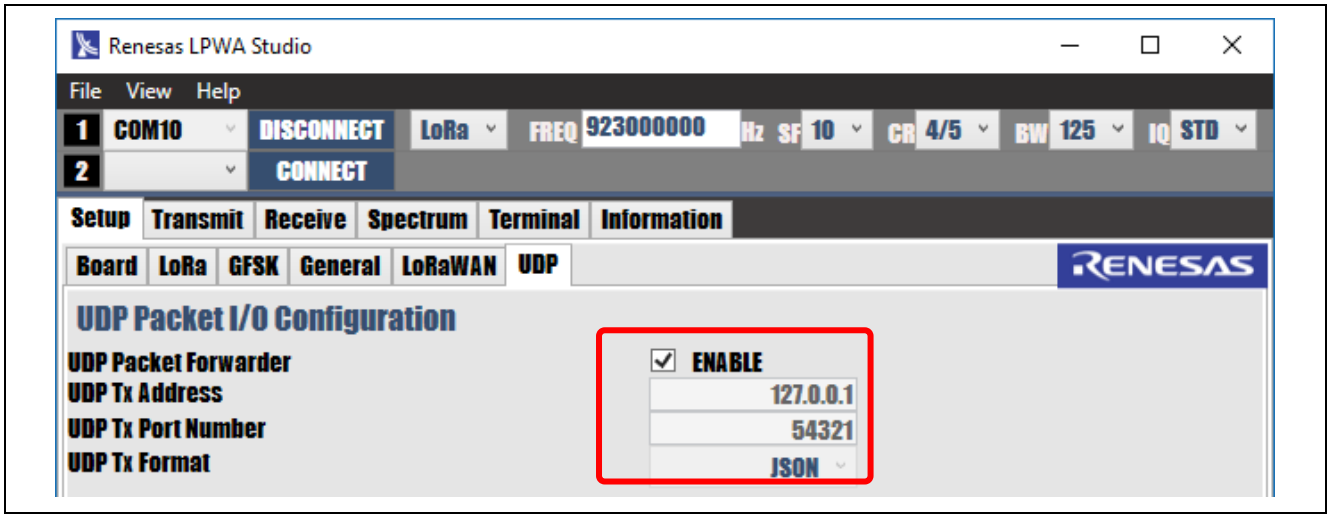

Figure 35. Configuring the UDP Packet Forwarder for External Programs

[Preparation on External Program]

External program bind the socket on the same address/port specified on the Renesas LPWA Studio.

[Operation]

Renesas LPWA Studio: Click **Receive** tab > Select **SNIFFER** > Click **Start**

External Programs: Listen to the socket to receive UDP packet forwarded by Renesas LPWA Studio.

[Simple example script to dump UDP packets]

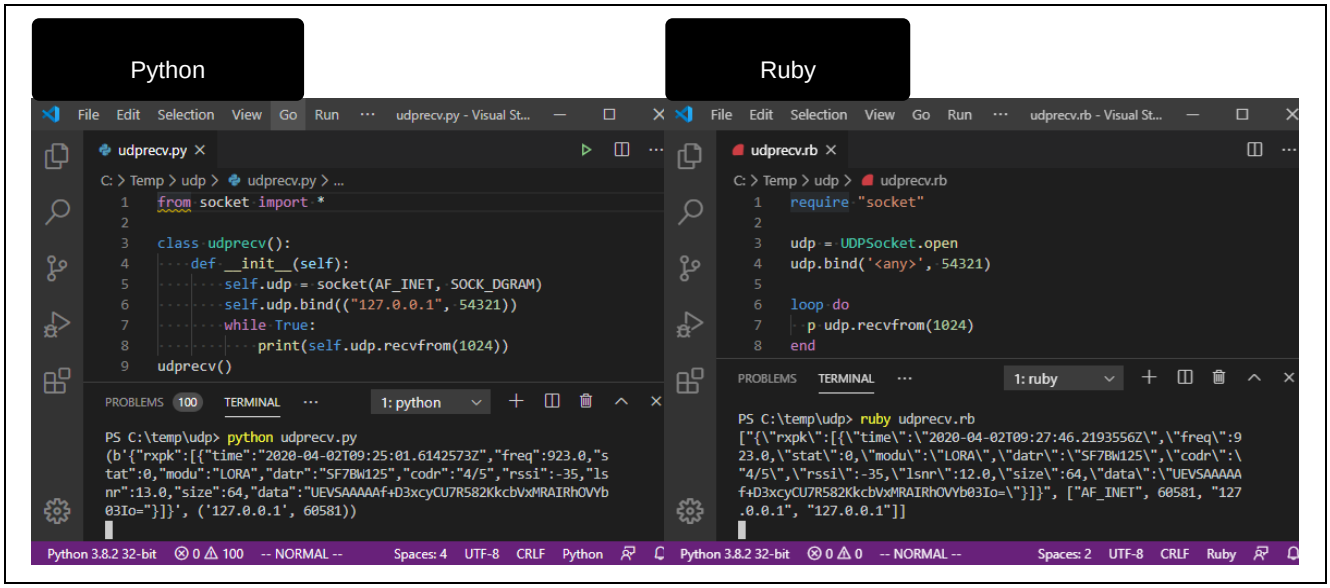

Figure 36. Example Scripts to Receive UDP Packets

[Example: Sensor Data Visualization Demo with UDP packet forwarding function]

Sensor Data > LPWA Studio > UDP/JSON >Python (`sensor_demo.py`) > influxDB/Grafana

[Preparation on External Programs]

- Install **InfluxDB 1.8.x** / **Grafana 7.1.x** and run (if Docker is available, Docker container is convenient).
- Install Python3 and InfluxDB library (pip install `influxdb`)
- Create database named `home` on the influxDB (`influx[RET] create databases home [RET] quit [RET]`)
- Configure data source on the Grafana (`URL=http://localhost 8086, Database=home, method=GET`)
- Run `sensor_demo.py` in the command prompt (`sensor_demo.py` is included in the release package) The `sensor_demo.py` will receive UDP packets, parse JSON, and write sensor data to the influxDB named **home** located on localhost:8086. If you use Docker container, you should modify influxdb server address in the `sensor_demo.py` from `localhost:8086` to influxdb docker container name:**8086**.

[Operation]

Start LPWA Studio as **UDP Packet forwarder** (start Rx with forwarding to 127.0.0.1:54321, JSON)

Start another LPWA Studio as **sensor node** (start Tx with sensor payload type)

Start query on the Grafana with following settings:

```
FROM sensor_demo WHERE deveui = lowest byte of the DevEUI
SELECT temperature or humidity
```

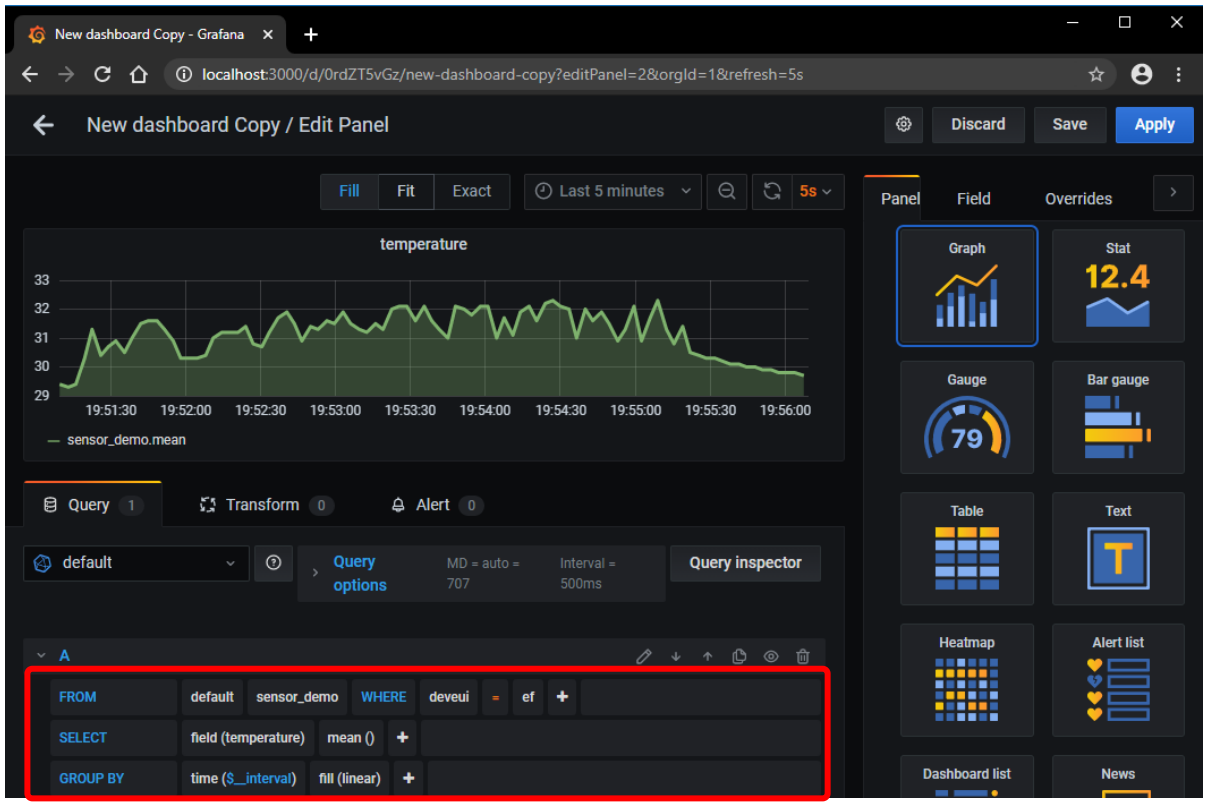

Figure 37. Sensor Data Visualization Demo with UDP Packet Forwarding Function

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Jan.29.18	All	First official release
1.10	Aug.30.19	5-7	Change firmware directory path. Add information regarding .NET framework.
		16	Add some recommended settings for PER/BER testing.
		21	Add LoRaWAN V1.0.3 (Class A/B/C) decode function.
		24-25	Update Wireshark version. Support local loopback interface.
1.11	Sep.26.19	All	Change program name and LoRaWAN trademarks
1.20	Nov.18.19	4	Change target board, Firmware Version. Delete flash programming tools.
		5	Change setup procedure regarding Radio Evaluation Program.
		6	Change installation and uninstallation procedure.
2.10	Jul.03.20	All	First release based on the Radio Evaluation Program (RadioEvalApp) V2.1
2.20	Sep.16.20	3,4,10,12, 14,27	Add new function regarding Tx/Rx sensor data (Humidity and Temperature) Add new sensor demo as the example of the UDP packet forward function.
3.00	Mar.02.21	3,4,5	Support RadioEvalApp V3.00 and RL78/G23-64p Fast Prototyping Board.
		6	Add notification regarding the security alert during installation.
		12,14	Fixed a resolution issue in the sensor data visualization window.
		All	No functional changes from V2.20.
3.01	Jun.07.21	6	Delete notification regarding the security alert during installation because Renesas LPWA Studio V3.0.0.3 or later supports the trusted code signing certification.
3.10	Sep.20.21	3,4,5	Support RadioEvalApp V3.10 and RL78/G23-128p Fast Prototyping Board.
		12	Add notification regarding the sensor mode with RadioEvalApp V3.10 or later.
		22	Add notification regarding LoRaWAN V1.0.4.
4.00	Aug.29.22	3,4,5	Support RadioEvalApp V4.00 for RA2 and FPB-RA2E1 board.
		22	Add check box to enable/disable the built-in LoRaWAN Packet Decoder.
4.10	Nov.29.22	2,3	Change RadioEvalApp version from 3.10 to 4.10.
4.20	Mar.31.23	2,3	Support EK-RA2L1 and RadioEvalApp 4.20.
		19	Support Semtech Packet Forwarder.
		20	Support LoRaWAN v1.0.4 and FUOTA v1.0.0/v2.0.0.
		21	Add Clip button to save the decoded frame to the file.
4.30	Apr.21.23	2,3	Support RL78/G22FPB and RadioEvalApp 4.30
4.50	May.24.24	2,3	Support RA0E1 FPB and RadioEvalApp 4.50

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