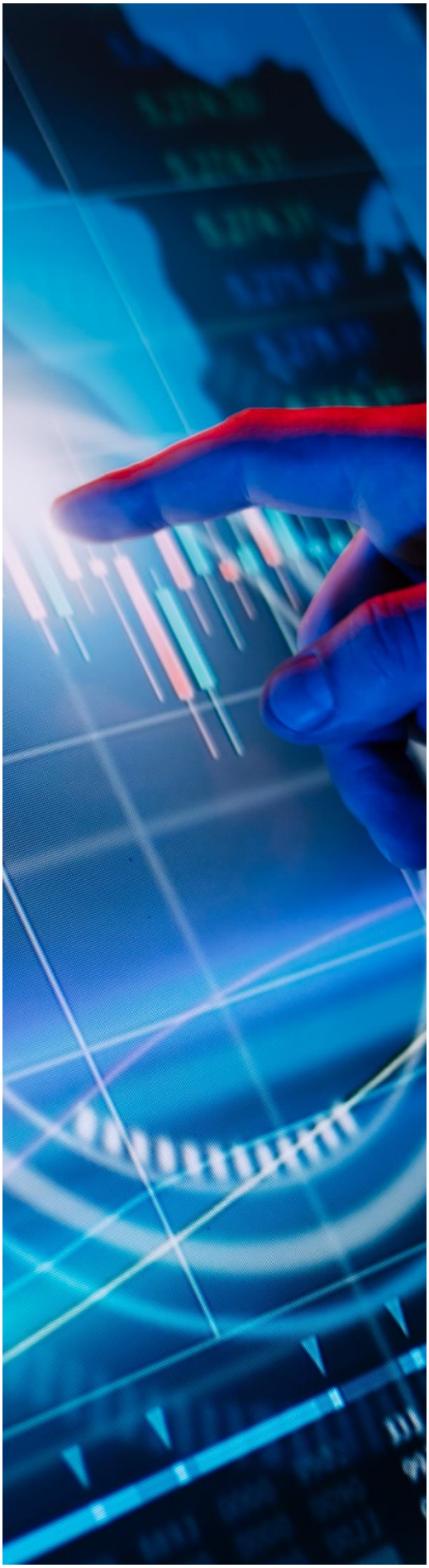

SG Wireless™

SGW6008 BLE-WiFi Gateway

User Manual

September 2020 V1.2

SG Wireless™ Confidential

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1. Introduction

The robust SGW6008 BLE-WiFi Gateway enables Bluetooth Low Energy (BLE) to WiFi connectivity without using an external smartphone or app. It collects data from BLE edge devices and sends the data over WiFi to the local server or remote cloud server using HTTPS and MQTTS protocols with TLS1.2 standard (Figure 1, with the edge device depicted by the SGW8130 BLE Sensor Tags).

Figure 1: *Data Collection and Transmission through SGW6008 Gateway*

As the connected solution for the SGW111X BLE Module and SGW8130 BLE Sensor Tag, the SGW6008 Gateway enables real-time remote monitoring or asset tracking for IoT applications, hassle-free.

IoT applications include but are not limited to:

- Industrial Smart lighting
- Smart logistics and transportation
- Smart devices for connected homes
- Smart city infrastructure

This user manual details the SGW6008 Gateway's provisioning process for access to the SGW IoT Platform (server), involving three procedures:

a. AP Mode configuration
b. WiFi network configuration for SGW IoT Platform
c. Gateway provisioning

This manual also describes the provisioning process of connecting the SGW6008 Gateway to an edge device.

2. SGW6008 BLE-WiFi Gateway

a. Exterior (Figure 2)

1. Micro-USB power input (5.0V DC, 1A)
2. AP mode button for network configuration with WiFi and Gateway provisioning
3. 3 LED status indicators (Table 1)

Figure 2: *SGW6008 BLE-WiFi Gateway*

Table 1: *SGW6008 LED Status Indicators*

	Power LED	BT LED	WiFi LED
Regular Operation			
Power On	On	Off	Off
BT Signal Transmission	On	Flashing	Off
WiFi Signal Transmission	On	Off	Flashing
AP Mode Operation			
AP Mode, Not Connected	Flashing	Off	Flashing
AP Mode, Connected	Flashing	Off	On
WiFi Configuration Success	On	Off	Flashing

b. Specifications

Absolute Maximum Rating	
Power Supply	5.5V DC
Storage Temperature	-20°C to 80°C
Recommended Operating Conditions	
Power Supply	5.0V DC
Operating Temperature	-10°C to 60°C
General	
Module	SGW BLE Module
Operating System	Amazon FreeRTOS
Protocol	TCP/HTTPS/MQTTS/TLS1.2
Power Input	1A @5V DC, micro-USB interface
Certification	CE, FCC and IC certified
Size	66.75 x 65.75 x 23.5mm
BLE RF Performance	
Radio Operating Frequencies	2402MHz ~ 2480MHz
Radio On-air Data Rate	1Mbps, 2Mbps
Transmit Power	10+/-2dBm
Antenna	Onboard PCB Antenna
Range	Up to 200 meters (open space)
WiFi Performance	
Wireless Standard	IEEE 802.11b/g/n (single stream)
Radio Operating Frequencies	2412MHz ~ 2484MHz
Radio On-air Data Rate	IEEE 802.11b, 1 – 11Mbps IEEE 802.11g, 6 – 54Mbps IEEE 802.11n (2.4GHz), 72.2Mbps
Transmit Power	17+/-2dBm
Antenna	Onboard PCB antenna
Security	WPA/WPA2
Encryption	WEP/TKIP/AES

3. Provisioning Procedures

The following tools are required for the provisioning process:

- Micro-USB cable and power source
- PC or mobile device
- Stable WiFi network
- SGW6008 BLE-WiFi Gateway

a. AP Mode Configuration

1. Put the SGW6008 Gateway in AP Mode by connecting it to the power source with the micro-USB cable.
2. Use the PC or mobile device to connect to the Gateway's WiFi network:
   Network Name: (available after Gateway purchase)
   Password: (available after Gateway purchase)
3. After joining the network, use a web browser to access the SGW Gateway Configuration Platform at http://192.168.4.1 (Figure 1).

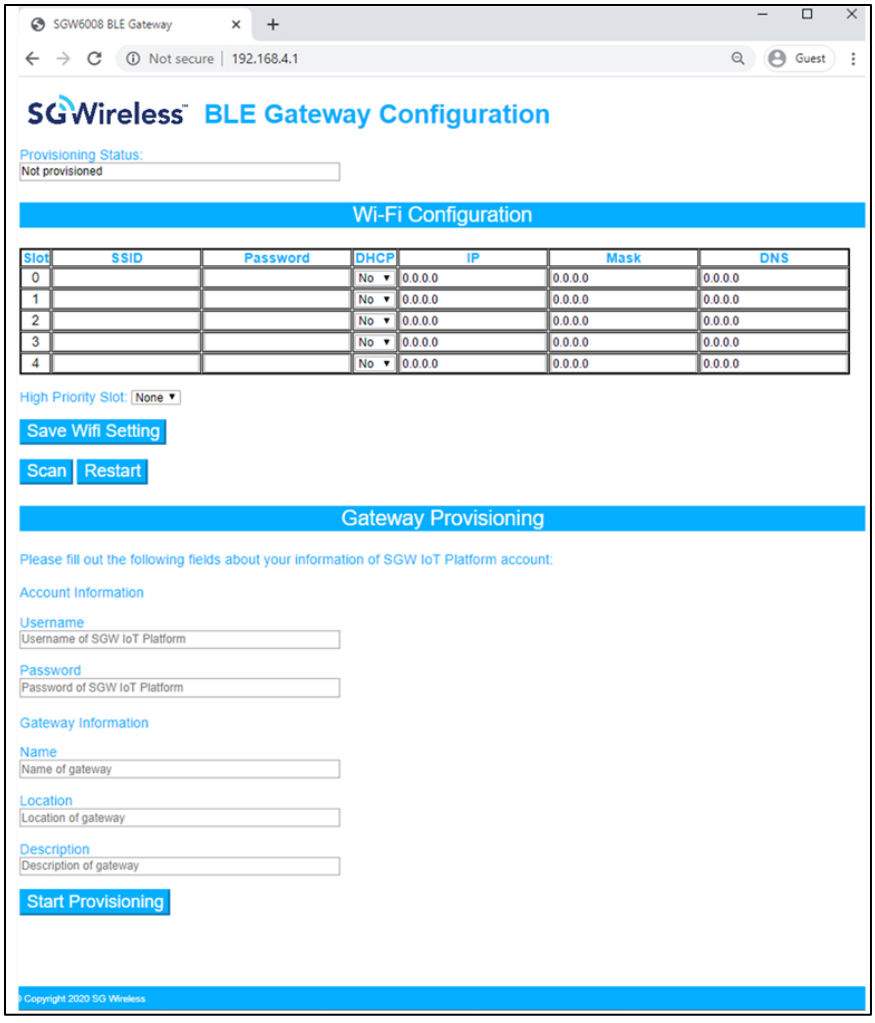

Figure 1: *SGW Gateway Provisioning Platform*

b. WiFi Network Configuration for SGW IoT Platform

There are two ways to configure the WiFi network for the Gateway:

1. Input your preferred WiFi network manually (Figure 2). Enter the network name and password (if applicable), and click 'Save WiFi Setting' when done.
2. Scan for available WiFi networks. Click 'Scan' for a list of available networks and enter the password (if applicable) for your selected network. Click the '+' symbol and click 'OK' to verify and confirm the network in the pop-up windows (Figure 3).

Note: The Gateway is designed to support 2.4GHz-capable WiFi networks due to the low data rate requirements for M2M. Up to a maximum of 32 characters in the WiFi password can be supported (excluding special characters +, " and \).

Note: If needed, WiFi settings can be further configured once the network has been added to the WiFi list. Be sure to click 'Save WiFi Setting' when done.

- If static IP is preferred, select 'No' for DHCP and enter the network's IP address, Subnet Mask and DNS.
- Use High Priority Slot to set the connection priority of saved networks.
- Remove WiFi networks from the list by deleting the network information.

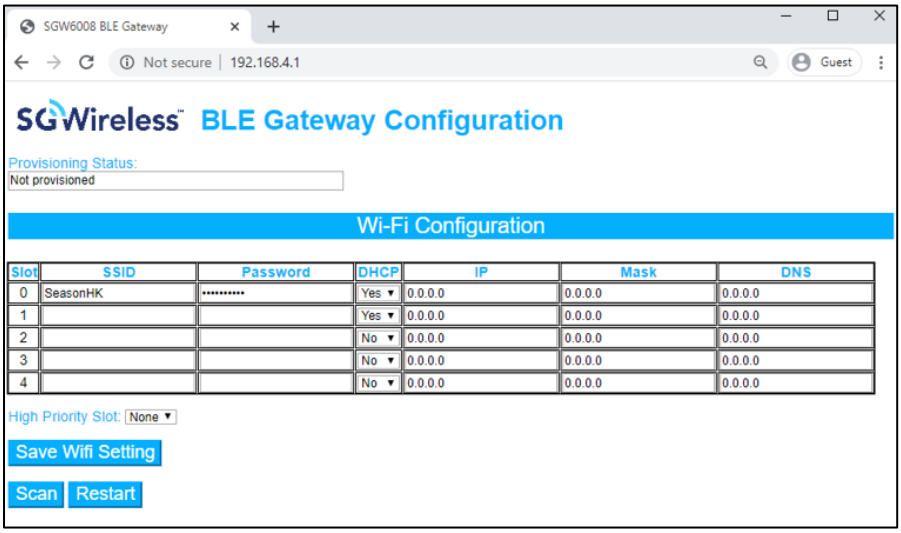

Figure 2: *Static IP and High Priority Slot*

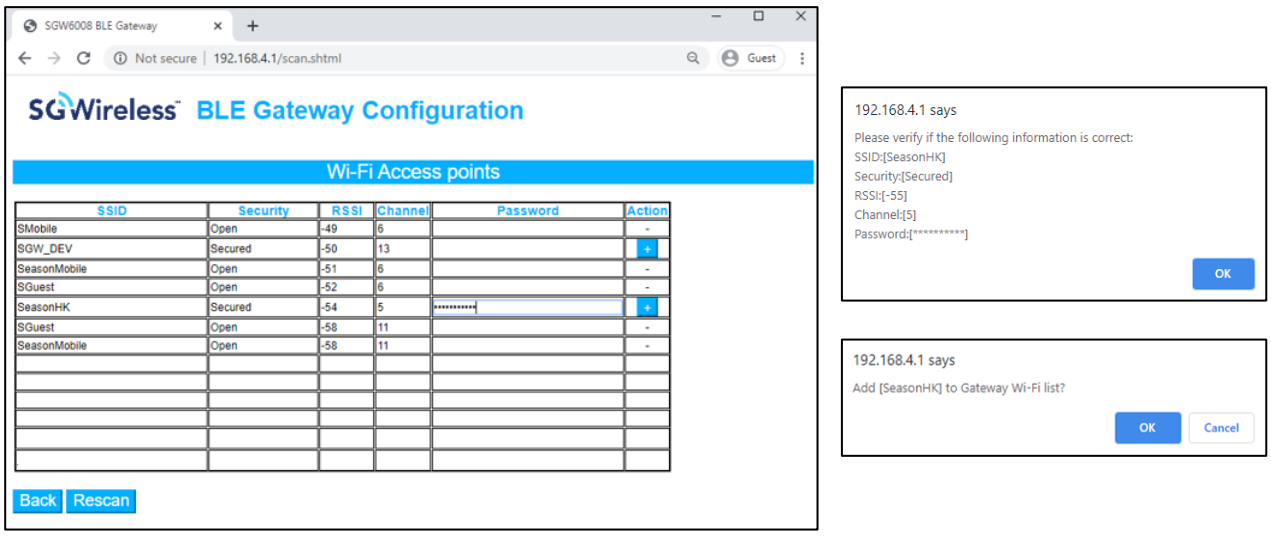

Figure 3: *WiFi Connection*

c. Gateway Provisioning

The Gateway has to be linked to a SGW IoT Platform account for data access.

1. Enter your SGW IoT Platform username (email address) and password, and label your Gateway with a name, location and description (Figure 4).
2. Click 'Start Provisioning', then click 'OK' to confirm Gateway provisioning in the pop-up window. The Gateway will self-reboot, and your PC or mobile device will reconnect to its original internet network. You will be directed to the SGW IoT Platform when provisioning is complete.
3. Login to the Platform with your username (email address) and password, and click 'Gateways' in the navigation bar on the left. The provisioned Gateway will appear in blue (Figure 5).

Note: Should the LEDs remain in AP mode operation after rebooting, please disconnect the Gateway from its power source completely and redo the provisioning procedures.

Note: Should you wish to configure a different WiFi network for the Gateway after provisioning is complete, first disconnect the Gateway from its power source, then put the Gateway back in AP Mode by holding down the AP Mode button while reconnecting it to power. Redo the procedures in section 3a 'AP Mode Configuration'.

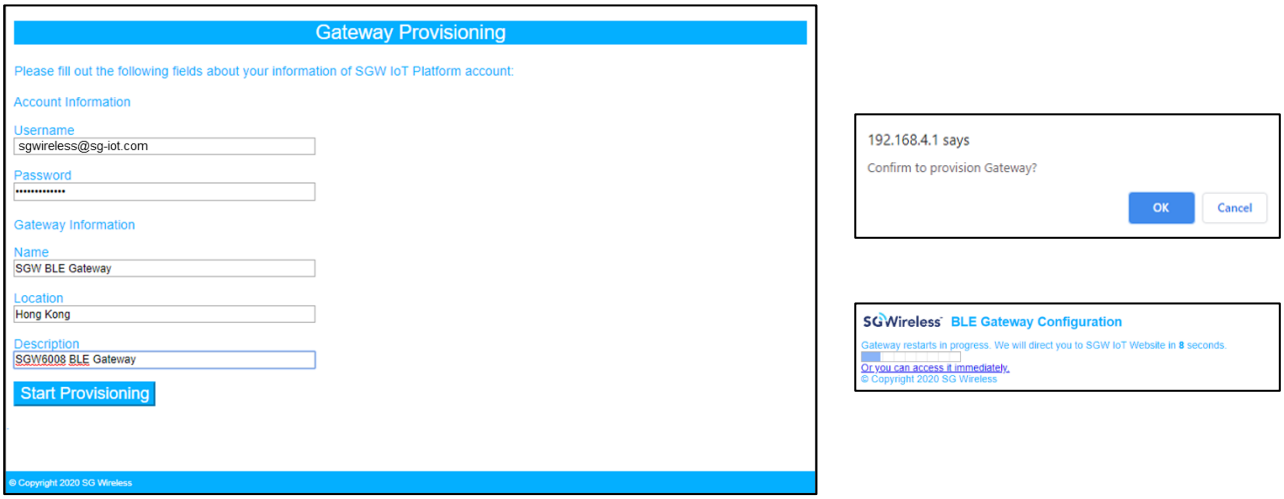

Figure 4: *Gateway Provisioning*

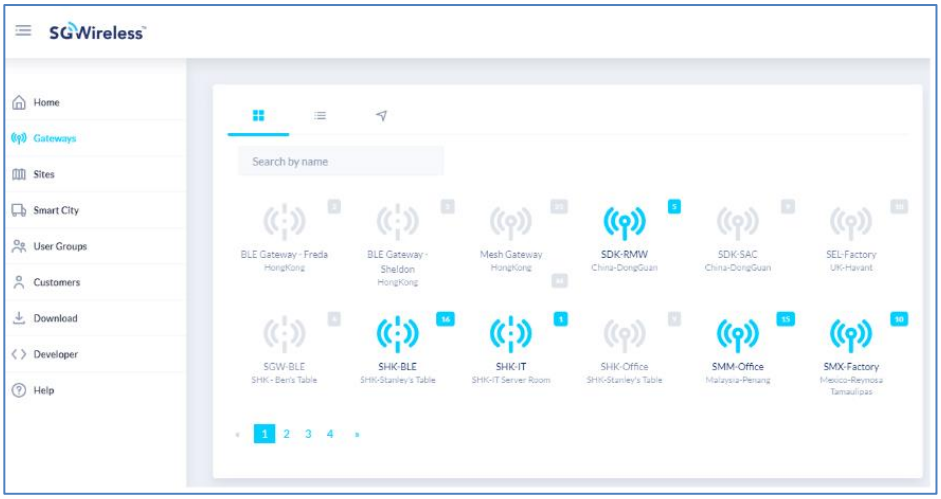

Figure 5: *Provisioned Gateways*

4. Edge Device Provisioning

The edge device needs to undergo a provisioning process to connect to the SGW6008 Gateway.

1. If you are not already logged in, use a browser to access the SGW IoT Platform at https://www.sg-iot.com. Login with your username (email address) and password.
2. Click 'Gateway' to show all provisioned Gateways (Figure 5). Select the Gateway to which you intend to connect the edge device.
3. Ensure that the edge device is turned on, then click 'SEARCH NEW BLE' to scan for all nearby edge devices. Discovered devices will appear as green icons with their network names matching the labels on the device (Figure 6).
4. Click the device to which you intend to connect the Gateway and label it with a name, location and description.
5. Click 'SUBMIT' to connect the device. It will now appear in the list of connected BLE Devices.
6. The edge device will start collecting data. Click the device to access the data.

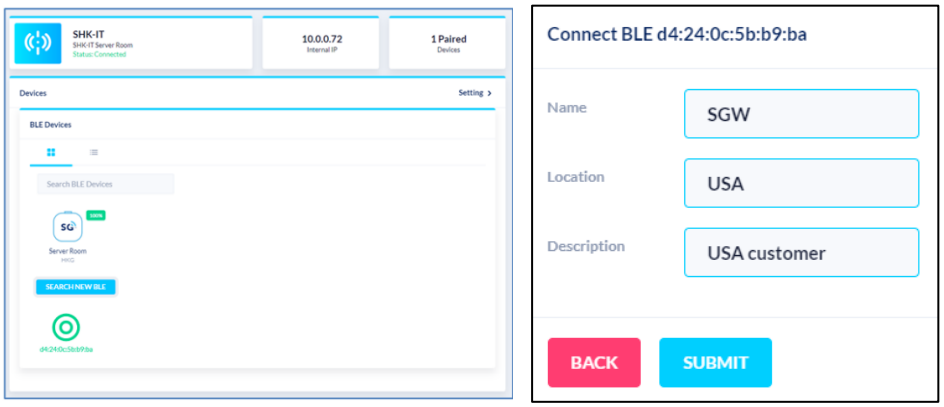

Figure 6: *Edge Device Connection*

5. Certification

a. CE Statement

Regulatory Conformance (RED)

Hereby, (SG Wireless Limited) declares that the radio equipment type (SGW6008) is in compliance with Directive 2014/53/EU.

CE

The full text of the EU declaration of conformity is available at the following website: https://www.sgwireless.com.

b. FCC Statement

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment

NOTE: 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 or more 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.
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

c. IC Statement

This device complies with RSS-247 of Industry Canada. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

d. RF Exposure Information and Statement

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Revision History

Revised	Version	Description
9-Mar-2020	1.0	Initial document release
27-Mar-2020	1.1	Provisioning section update, formatting update
24-Sep-2020	1.2	Provisioning section update

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