LoRaWAN Gateway

PLG400 Manual

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

Revision History

Who	*Version*	*Date*	*Comment*
Benjamin Lee	1.0	Jul 17, 2019	Initial release
Aaron Hwang	1.1	Feb 03, 2020	

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

TABLE OF CONTENTS

Caution **4**

1. Introduction **5**

2. Hardware Specification **6**

3. Components **8**

4. Quick Start **8**

5. Preferences **9**

5.1 Connection & Login 9

5.2 Networks 11

5.3 LoRaWAN 12

5.4 OpenVPN 13

5.5 Log 14

5.6 Software Update 15

6. Gateway installation environment and examples **16**

7. Troubleshooting **17**

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

Caution

Any changes or modifications (including the antenna) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

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.

To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. This device must not be co-located or operation in conjunction with any other antenna or transmitter.

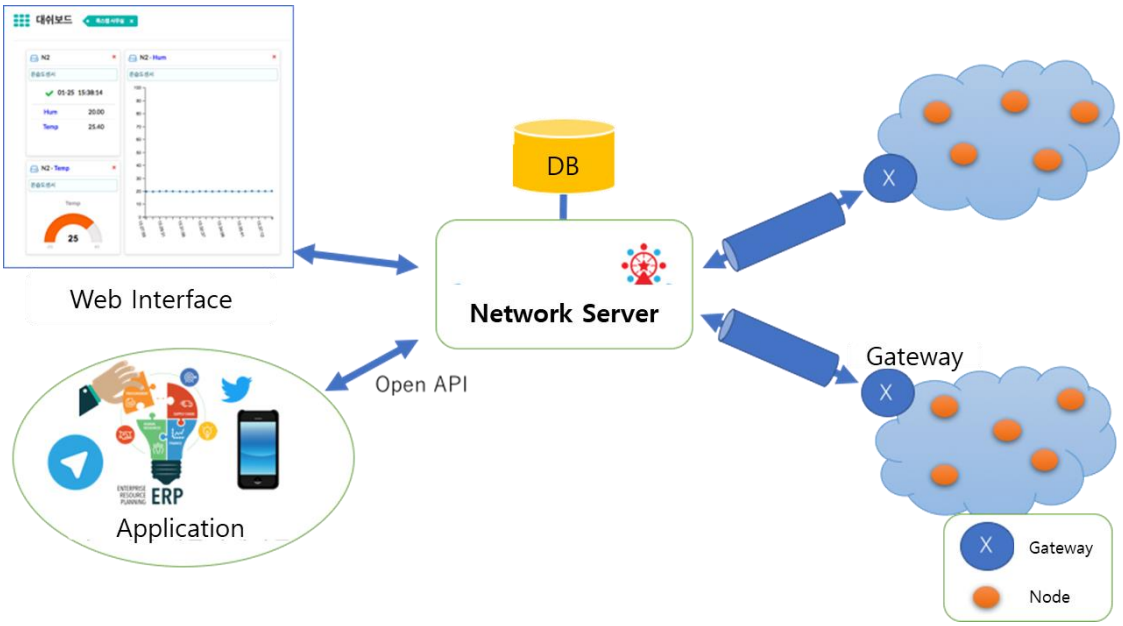
This equipment complies with FCC

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

1. Introduction

IoT refers to the connection of wireless and wired-based sensing systems to the Internet and the web. Through this, the value of sensing data is maximized by facilitating the use of sensing data.



LoRa Gateway is located between the Node and the Network Server system and converts the sensing data provided by the Node into a Network Server compatible format and transmits the commands sent from the Network Server to the Node. Usually, a Linux router with wired (Ethernet) and wireless (Bluetooth, LoRa, ZigBee, etc.) communication interfaces based on processors such as ARM Cortex-A series and MIPS.

PLG400 is a LoRaWAN gateway that can be installed outdoors. LoRaWAN is a low power wide area (LPWA) wireless network technology widely used in the Internet of Things, and the PLG400 connects various installed LoRa sensors to the Internet.

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

2. Hardware Specification

The hardware specifications of the PLG400 are as follows

.

Category			Description
H/W	CPU		800MHz Sitara™ ARM® Cortex®-A8 32-Bit RISC Processor (AM3352ZCZA80)
	SDRAM		512MB DDR3L SDRAM
	Flash		4GB NAND Flash with MMC controller
	Power Supply		DC 48V PoE, 24W
	Dimension		226 x 183 x 65 (W x H x D, mm)
	Weight		1.7Kg
	RF	LoRa	SX1301
	I/O	Ethernet	10/100/1000 B-TX 1 Port With POE
		Console	Micro USB
		USB	2.0 Full-Speed x2 (USB A Type)
S/W	OS		Linux kernel 4.14.79 (32bit)

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

Description of each part of PLG400 is as follows.

- **Front**

① **LoRa**: LoRa Antenna connection Port

② **GPS**: GPS Antenna connection Port

- **Rear**

① **PoE 48V** : Power & WAN connection Port

② Pressure valve

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

3. Components

Category	Quantity
PLG400 Gateway	1
LoRa Antenna	1
GPS Antenna	1
PoE Injector	1

4. Quick Start

The PLG400 is set up to connect to the WAN using DHCP. Therefore, a PoE injector can be used to connect a LAN for the Internet connection to the WAN and connect the power. When the power is connected, the PWR, WAN inside the device turn on.

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

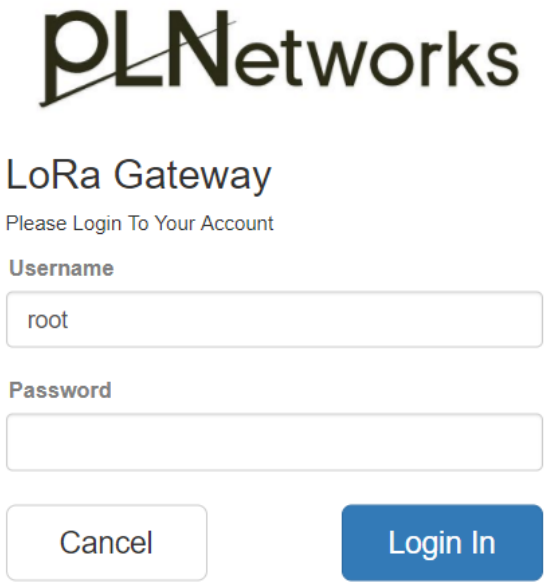
5. Preferences

5.1 Connection & Login

To change various settings of the PLG400, you need to access the built-in web interface.

- Access the assigned IP through the WAN port of the gateway. If you are using a static IP or know the IP address assigned through a DHCP server, you can use that IP address to connect.
- Enter port 8080 after the IP address to connect. Ex) http: // [IP address]: 8080

When connected, the login screen will appear as shown below.

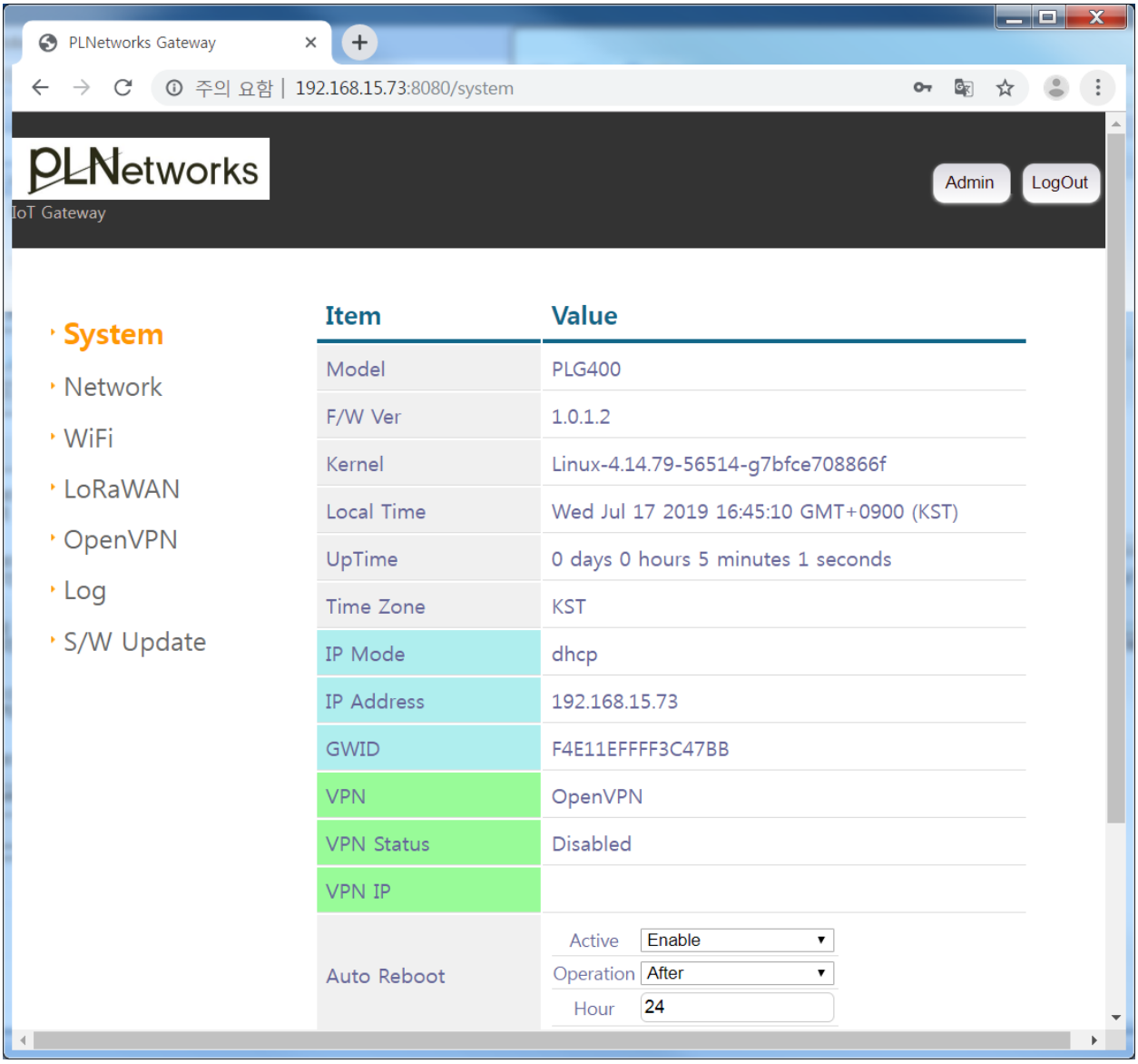


D and Password to input are as follows.

ID	root
Password	admin

Copyright © 2018 **PLNetworks**
The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

After logging in, the PLG400 system screen appears.

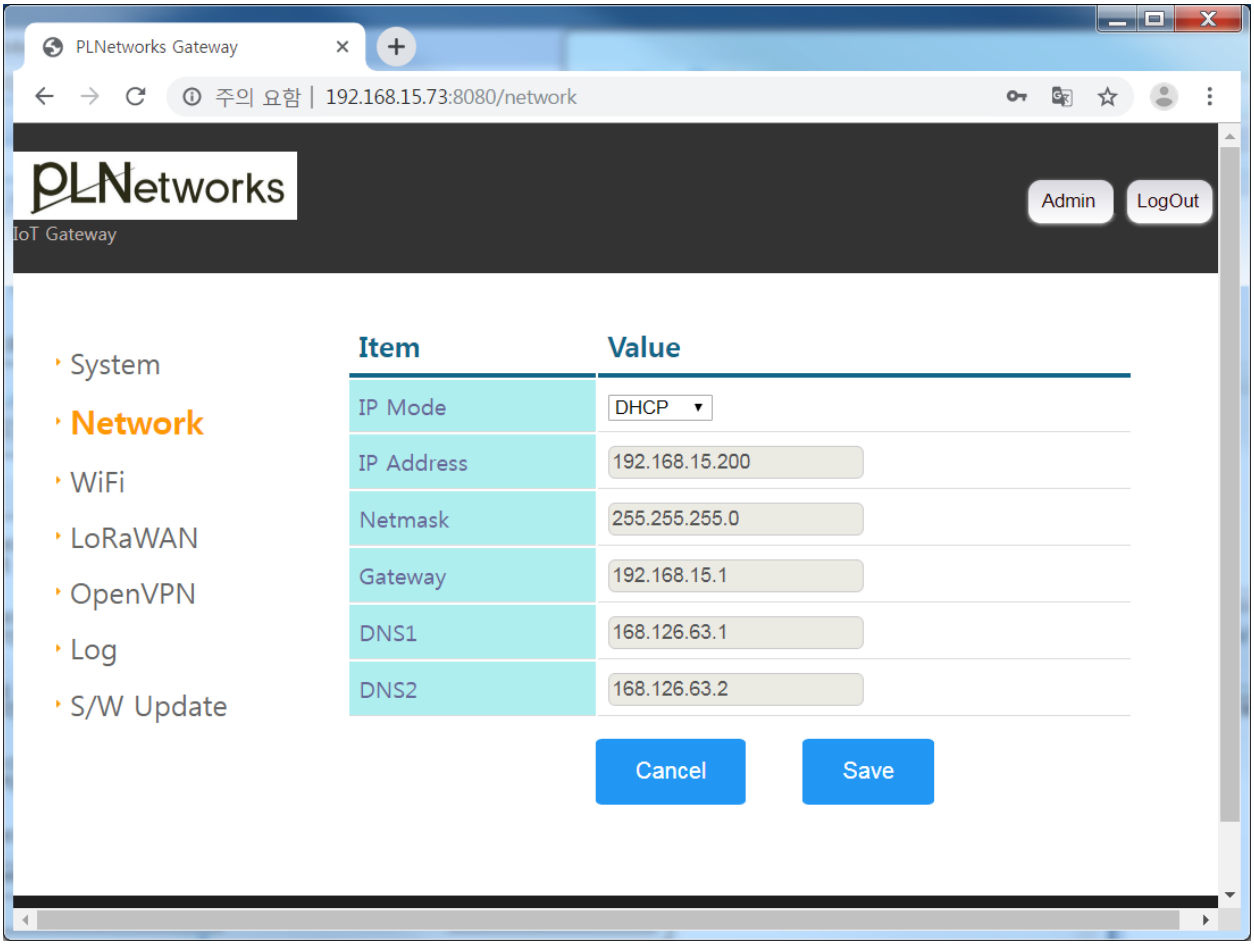


Shows the model and network, firmware and kernel versions currently reflected in the PLG400.

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

5.2 Networks



The displayed parameters represent the values currently set in the PLG400.

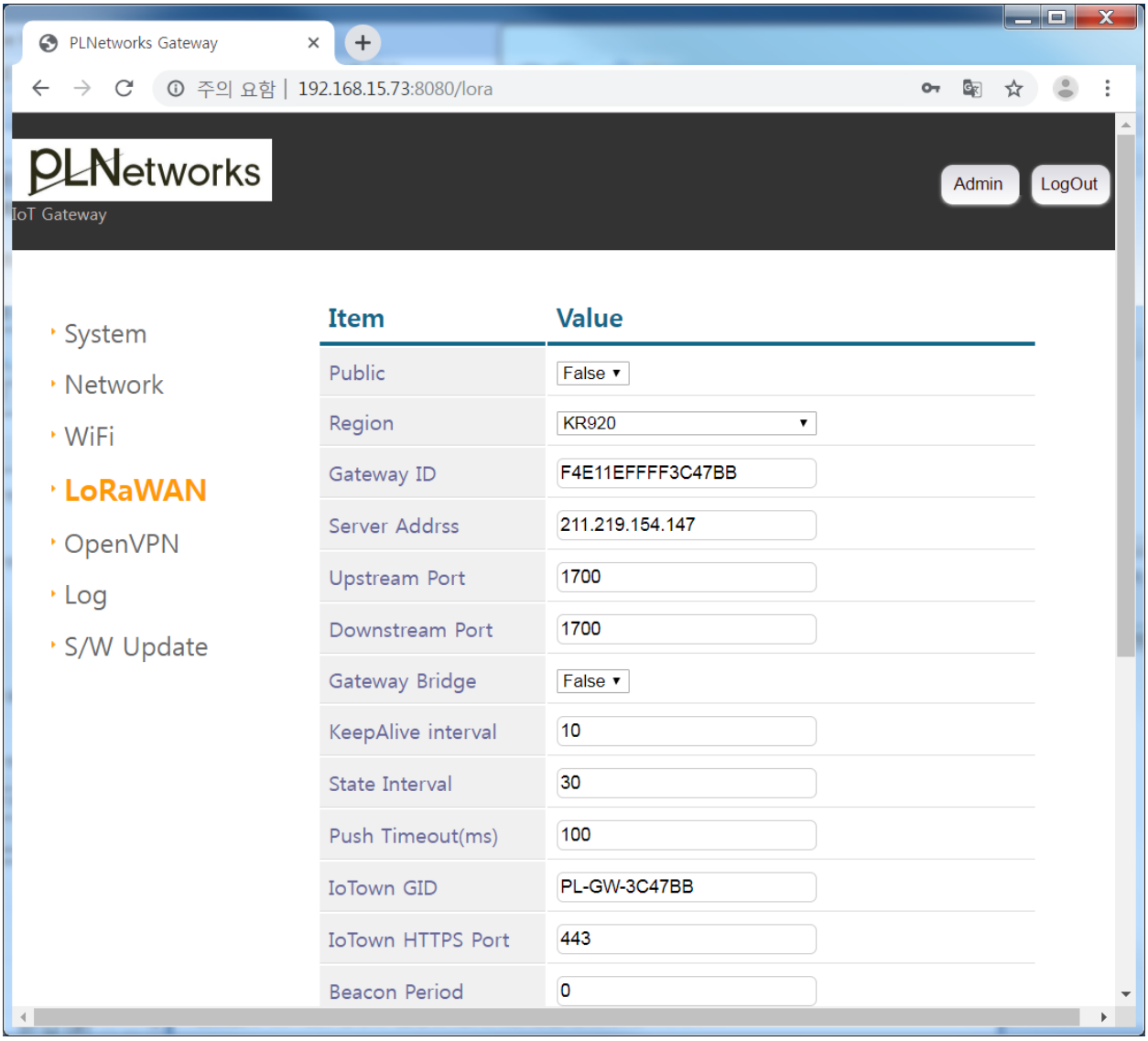
Set the IP address that the PLG400 will use to connect to the WAN.

- Static / DHCP: Set whether to use static or dynamic IP.
- Local IP: If you are using a static IP, enter the IP address to use.
- Netmask: Enter the subnet mask if using static IP.
- Gateway: If using a static IP, enter the gateway IP address to use.

Click on the 'Save' button at the bottom to save the settings.

Copyright © 2018 **PLNetworks**
The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

5.3 LoRaWAN



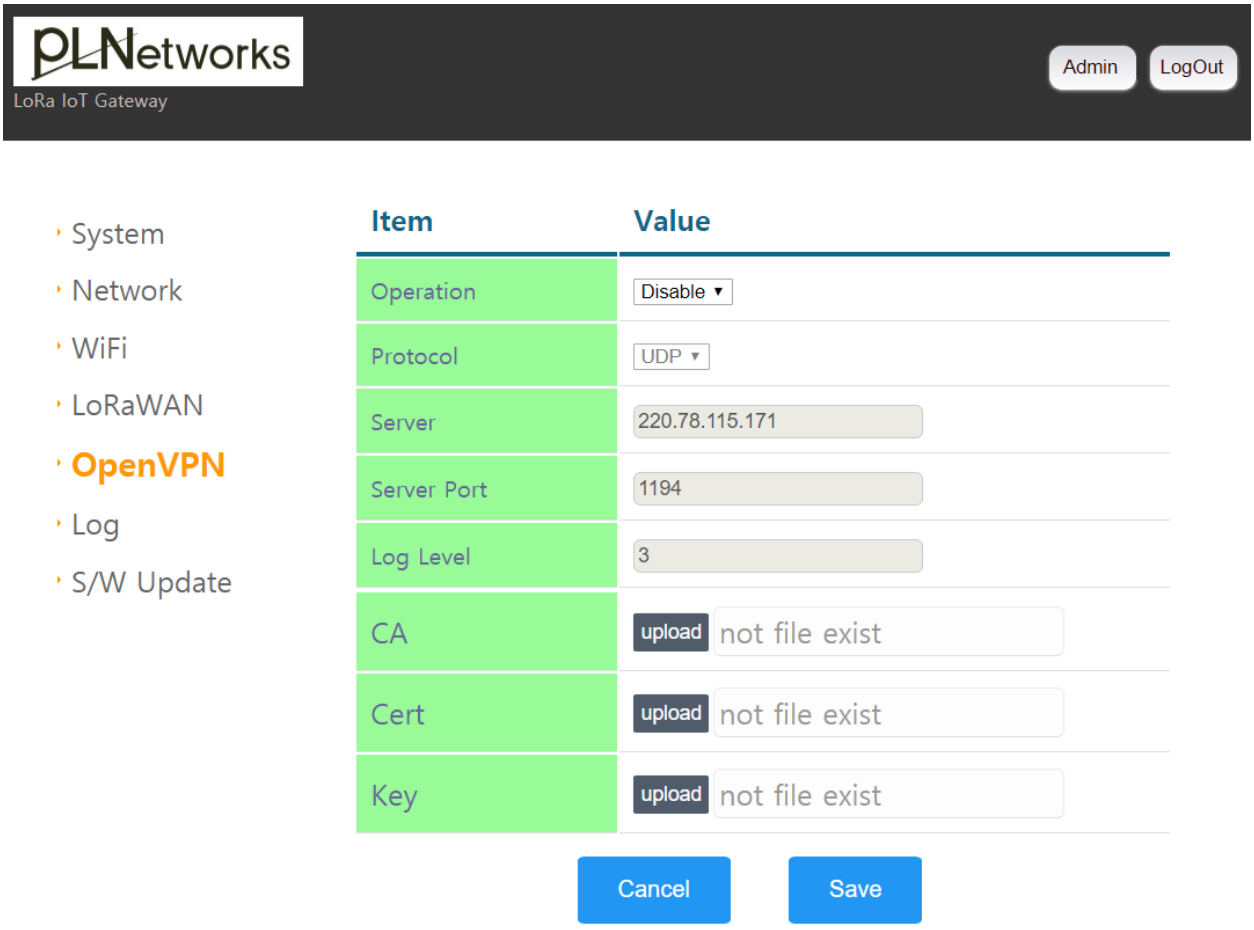
LoRaWAN parameter value can be set.

- You can adjust KeepAlive interval of IP, Port and Gateway of Network Server.
- IoTown GID can get the basic information (Boot Time, Recent Act., Etc.) of the Gateway by using the same name when registering the Gateway in the Network Server..

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

5.4 OpenVPN

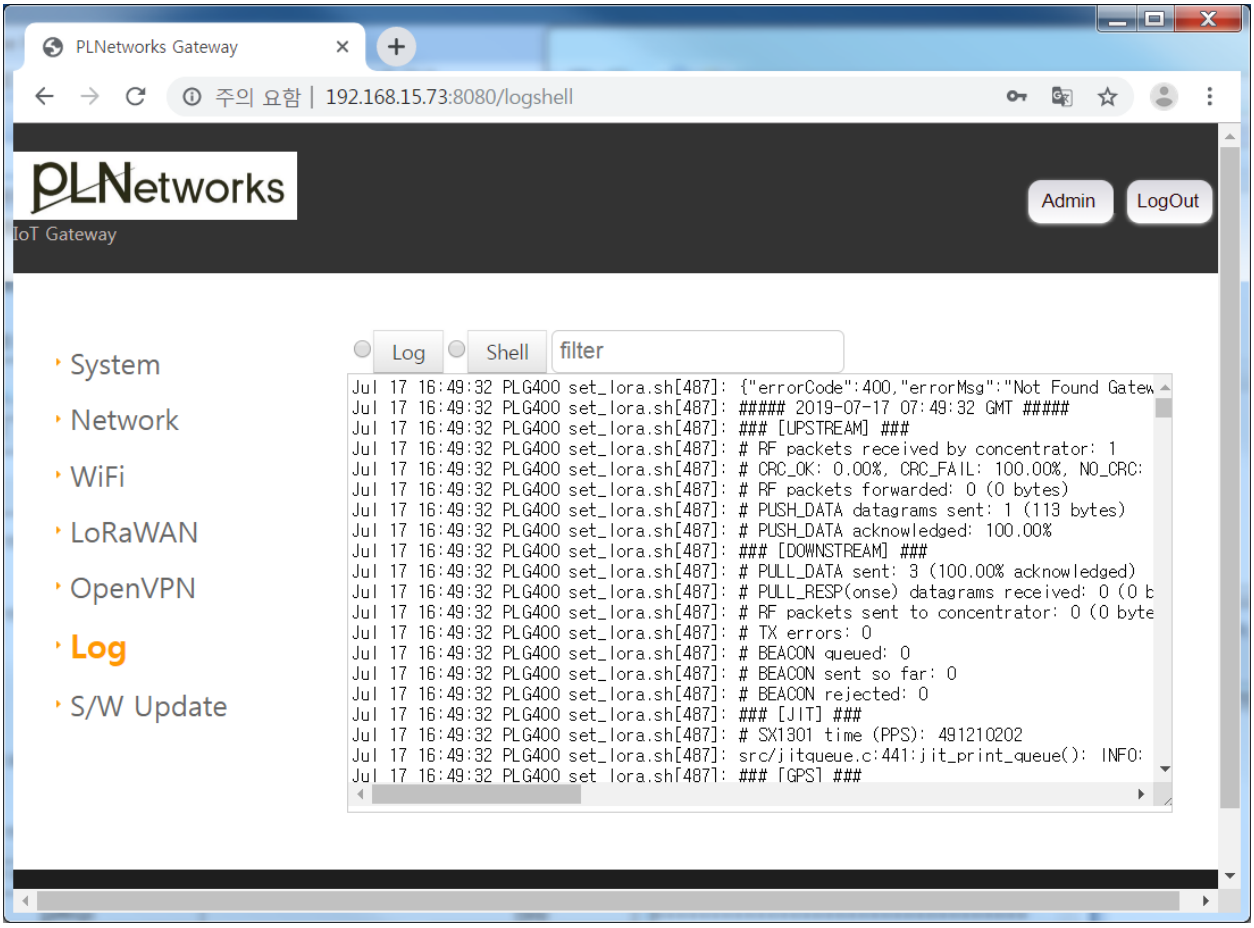


You can configure the settings for using OpenVPN (Protocol, VPN Server IP, etc.).

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

5.5 Log



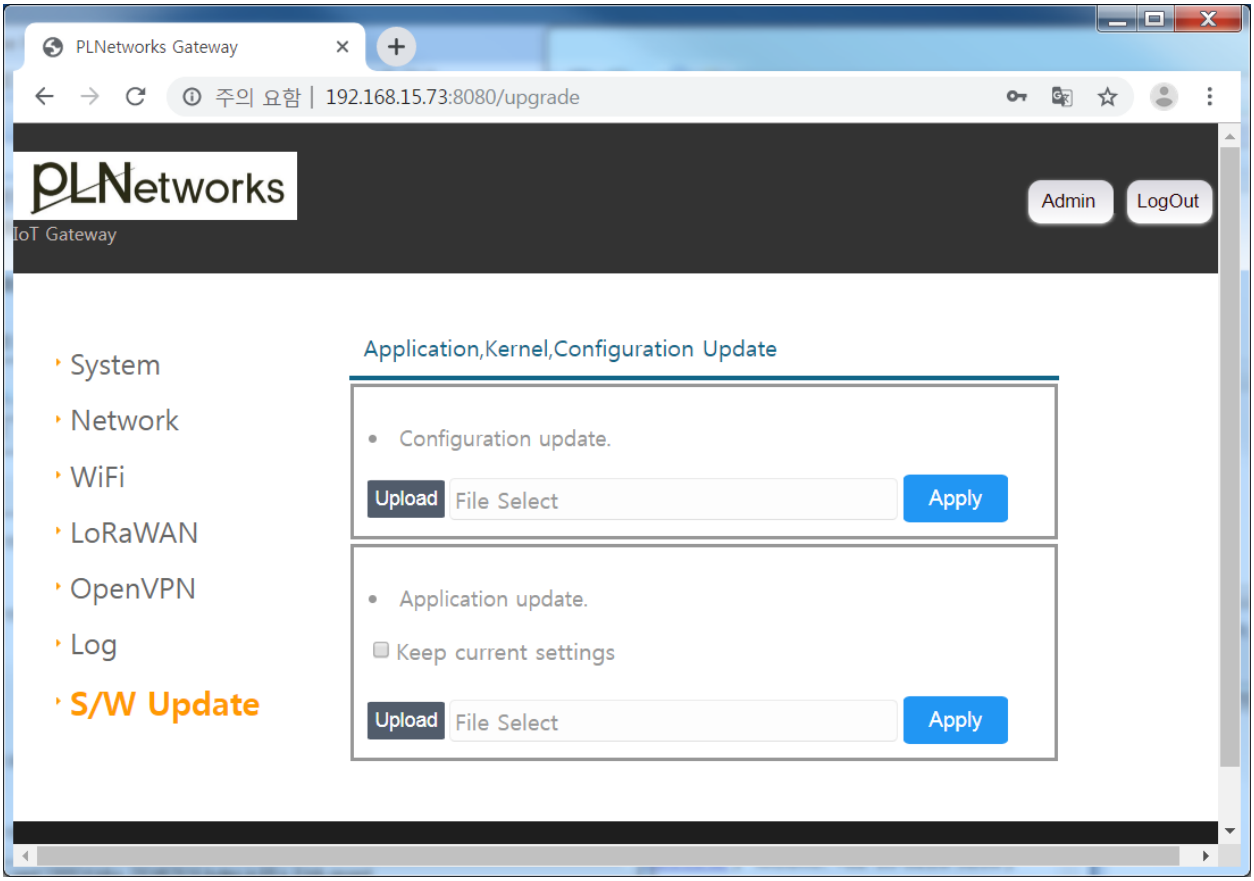
It shows the status window and log related to the linkage between PLG400 and LRR (server). If you press ‘Shell’ button, you can search the status by typing Shell command at the bottom. Four Commands can be entered.

- ps
- cat
- ls –al
- systemctl stop [process name]

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

5.6 Software Update



You can update configuration files, applications, and kernel files.

To update the file, press File Select to select the file, click Upload to upload the file, and then click the 'Apply' button. Reboot proceeds after applying and takes 2 ~ 30 seconds.

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

6. Gateway installation environment and examples

- Gateway installation environment
  - ✓ Erect and install a separate pole on the roof of a building or on a high terrain to accommodate multiple node sensors.
  - ✓ Install directly using a bracket on the pole or install it in a separate dedicated enclosure.
- Gateway installation examples

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.

7. Troubleshooting

- The PWR LED does not light up.

  → Make sure the 48V PoE adapter provided with the gateway is physically connected

  → After removing the adapter, apply power again after a full discharge (approximately 20 to 30 seconds).

- LoRa LED does not light up.

  → Check that the gateway is registered in the network server as a compatible device.

  → After pressing the reset switch, check if it operates normally.

- The WAN LED does not light up.

  → LAN Check if the LAN cable is properly connected to the WAN port.

  → Check that the gateway is registered in the network server as a compatible device.

Copyright © 2018 **PLNetworks**

The information contained herein is the property of PLNetworks and is provided without liability of errors, omissions, and mistakes. No part may be reproduced or copied without written permission or contract.