

ESL Solution Introduction

(Connecting your ESL to IOT cloud promptly)

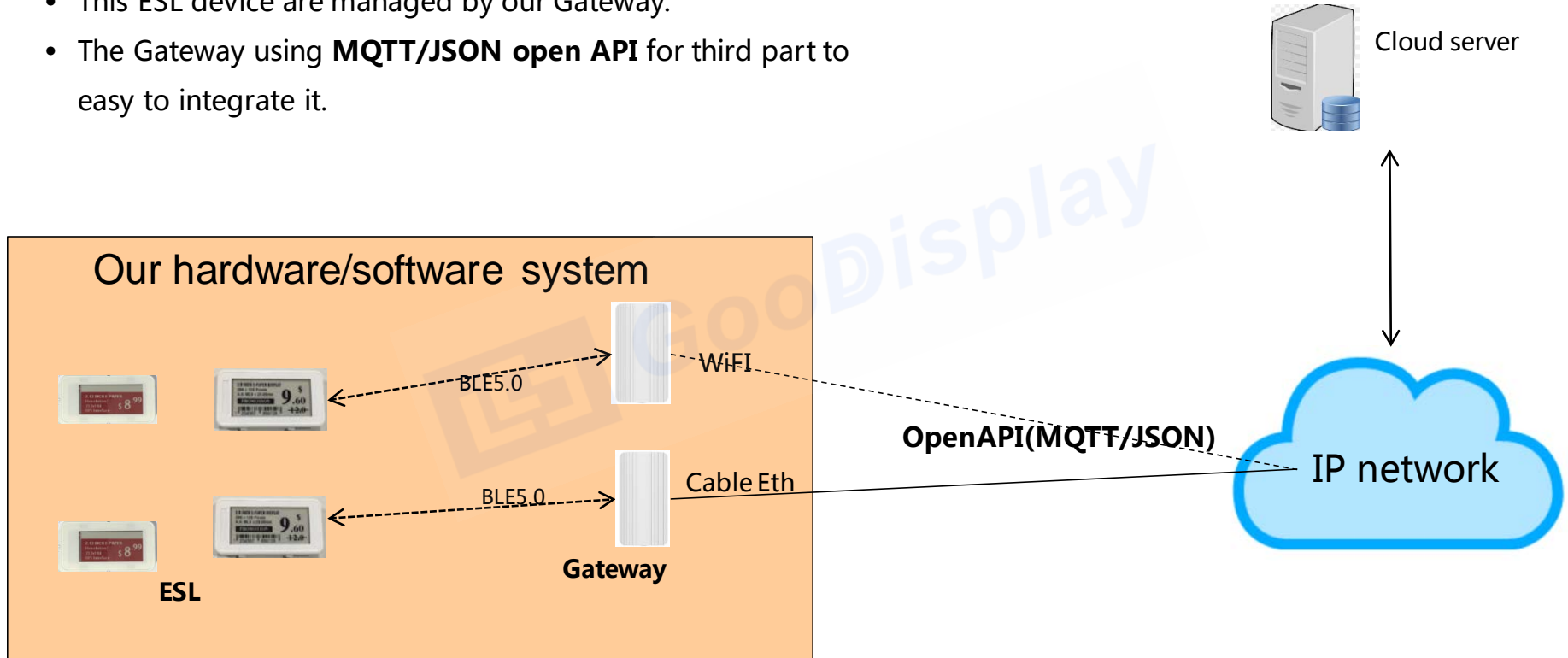
Contents

- **Introduction**
- **ESL Solution Feature**
- **Other Solutions**



Software/hardware Architecture solution1

- This ESL device are managed by our Gateway.
- The Gateway using **MQTT/JSON open API** for third part to easy to integrate it.



Software/hardware Architecture solution2

This ESL provide open API and can be managed by IOS/android app.

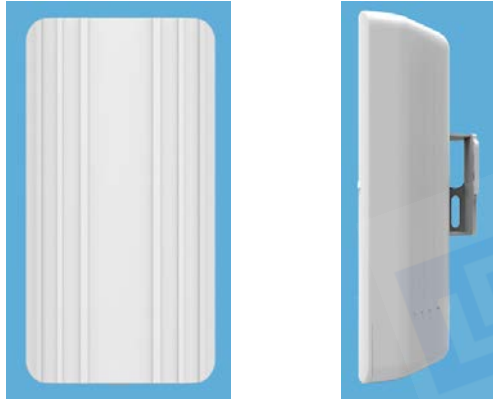


ESL Gateway



- **Water proof-IP54/Sun proof (Industry only)**
- **BLE5.0 Long distance Feature (Industry only)**
- **BLE distance: > 200 meters in open space**
- **Self-organized for ESL device**
- **Open protocol: MQTT to cloud**
- **Configuration: Web portal**
- **Transmit: ETH/Wifi/Wifi-hopping**
- **Power: 5V DC and ETH PoE(802.3af)**
- **BLE chip: NRF52840**

ESL Gateway Specifications



Parameter	Specifications
Power	<ul style="list-style-type: none">• 802.3af PoE• DC 5V
Manage ESL number	> 1000 ESL
Wireless distance	<ul style="list-style-type: none">• BLE5.0: > 200 meters• BLE4.0/4.1/4.2 > 100 meters (depends on environment)
Max BLE Tx Power	8dBm
Transmitting way	<ul style="list-style-type: none">• ETH RJ45• WiFi• WiFi hoppen• 3G/4G (Need extend USB dongle)
Transmitting protocol	<ul style="list-style-type: none">• Standard MQTT/MQTT with TLS• Azure Iot Hub
Installation way	Screw
Waterproof/Dustproof	IP54
Material	ABS

KESL021C ESL Specifications



Parameter	Specifications
Screen Size	2.1Inch
Pixels	212×104
Total Size	74×40×12mm
Power	2 × CR2450 Battery
Work time	> 4 Years
Power consumption	Standby: < 25uA Refresh picture: < 15mA
Wireless distance	<ul style="list-style-type: none">• Outdoor around 100 meters• Indoor around 30-50 meters (depends on environment)
Transmitting protocol	BLE4.1/BLE5.0
Installation way	3M or Pylons
Material	ABS

KESL029C ESL Specifications



Parameter	Specifications
Screen Size	2.9Inch
Pixels	296×128
Total Size	74×40×12mm
Power	2 × CR2450 Battery
Work time	> 4 Years
Power consumption	Standby: < 25uA Refresh picture: < 15mA
Wireless distance	<ul style="list-style-type: none">• Outdoor around 100 meters• Indoor around 30-50 meters (depends on environment)
Transmitting protocol	BLE4.1/BLE5.0
Installation way	3M or Pylons
Material	ABS

KESL042C ESL Specifications



Parameter	Specifications
Screen Size	4.2Inch
Pixels	400×300
Total Size	103×92×8mm
Power	Li-Ion Battery 850mAh
Work time	> 2Years
Power consumption	Standby: < 25uA Refresh picture: < 25mA
Wireless distance	<ul style="list-style-type: none"> • Outdoor around 100 meters • Indoor around 30-50 meters (depends on environment)
Transmitting protocol	BLE4.1/BLE5.0
Installation way	3M or Pylons
Material	ABS

ESL Family



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I . ESL feature--- Multiple pictures stored

Pictures displayed on screen

Long Fu Water
Made in china

Price: \$2.0

The ESL can store multiple pictures in flash, and the cloud can specific which picture to be shown

Picture stored in flash

Long Fu Water
Made in china

Price: \$2.0

Picture node 0

water **25% OFF**

Price: \$1.5

Picture node 1

water **Hot sell**

Price: \$1.5

Picture node 2

water **Hot sell**

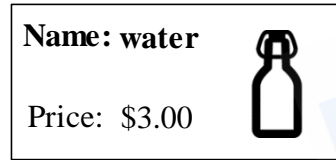
Price: \$1.0

Picture node 3

I . ESL feature--- Partial picture update

1. By partial picture refresh mode, the cloud server/app can greatly reduce download time, especially for large-screen ESL
2. The cloud can update current showing picture node or stored picture node.

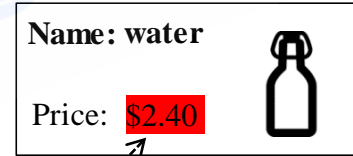
Before refresh



Picture node 0



After refresh

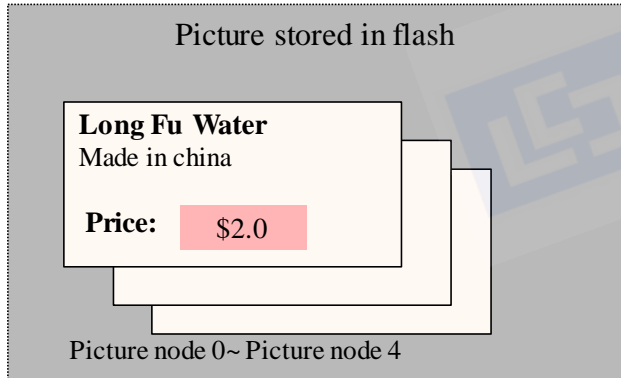


Picture node 0

Refresh block area1

I . ESL feature--- Multiple pictures play mode

Picture displayed



ESL supports:

- ✓ **Single picture play**

The cloud/app can specify a picture node to display;

- ✓ **Periodically loop play**

The cloud/app can specify the time (in seconds) for each picture to play, and then loop play;

- ✓ **Play Base on UTC time**

The cloud/app can specify multiple pictures play according UTC time.

- ✓ **Periodically loop play based on UTC time**

The cloud/app specify the picture to play at the specified time every day;

I . ESL feature--- parameters management



The cloud/app can :

- ✓ Modify BLE device name
- ✓ Modify BLE TX power
- ✓ Modify BLE advertisement interval
- ✓ Modify BLE connection password
- ✓ Modify UTC time

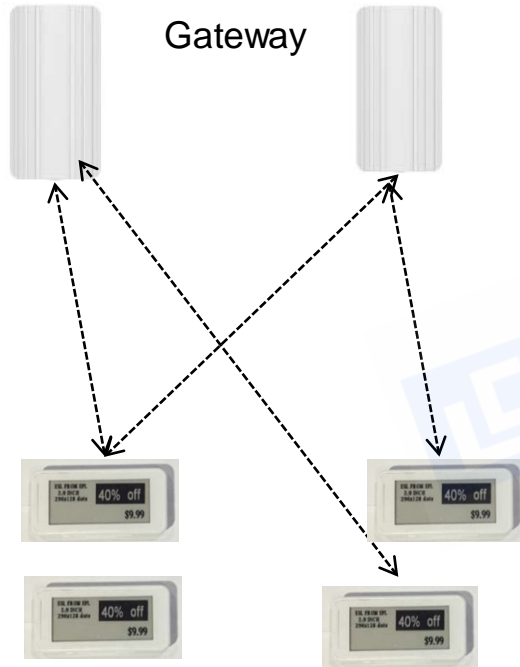
- ✓ Get picture information in ESL
- ✓ Get BLE parameters in ESL

I . ESL feature--- location management



- All ESL will send BLE beacon signal, and the AP can get the beacon signal and get the ESL location.
- When the user is close to the ESL, the user's mobile app will push the promotion information to the user.

II. AP--- Self-organized deployed



- Once you deployed the ESL(>1000pcs) and Gateway, the relationship between ESL and Gateway will **automatic setup within 3~5 minute**.
- Gateway supports **redundant configuration**, once one Gateway down, other Gateway(with in same coverage) will automatic take over ESL management within 10 seconds.
- Gateway support **pool load balance deployed**, the Customer Inventory System can select an light load Gateway to update price about ESL.

II. AP--- Opening Platform Design

ESL Gateway not only an ESL manager. It's an **open platform to make your ESL and other sensor easily connect to the cloud.**

All the interface are opening to the third part.

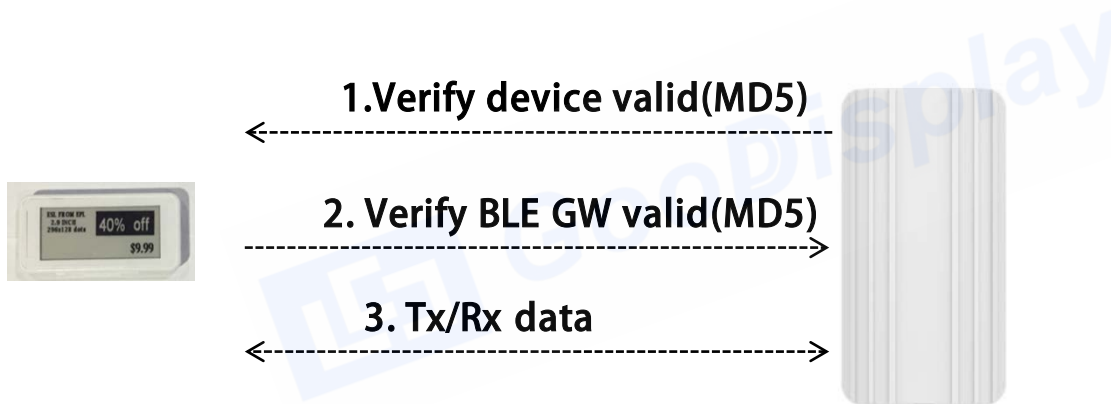
- Support the third part ESL/BLE device connect to the cloud via BLE GW;
- Support the third part MQTT server;



Beacon for navigation/promotion

II. AP--- 128 MD5 authentication ensures device security

To ensure that the devices and gateways are not illegally connected, BLE Gateway and device using Bi-directional MD5 with random authentication.



II. AP--- Web portal Configuration


The Gateway Support Web portal configuration, for example: chrome explore

- No need to install app

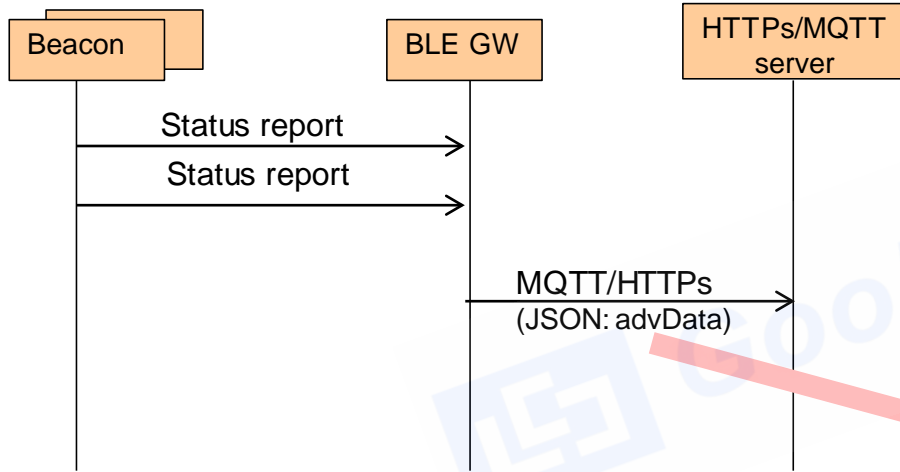
Admin Status Network Service Others Logout

MAC	66:E8:65:02:85:47
NetWorkMode	repeater
Eth WAN IP	N/A
WLAN WAN IP	192.168.3.198

AP CONFIGURATION

AP SSID	<input type="text" value="blegw_66E865E28547"/>
AP LAN IP	<input type="text" value="192.168.8.1"/>
AP Password	<input type="password" value="....."/> 

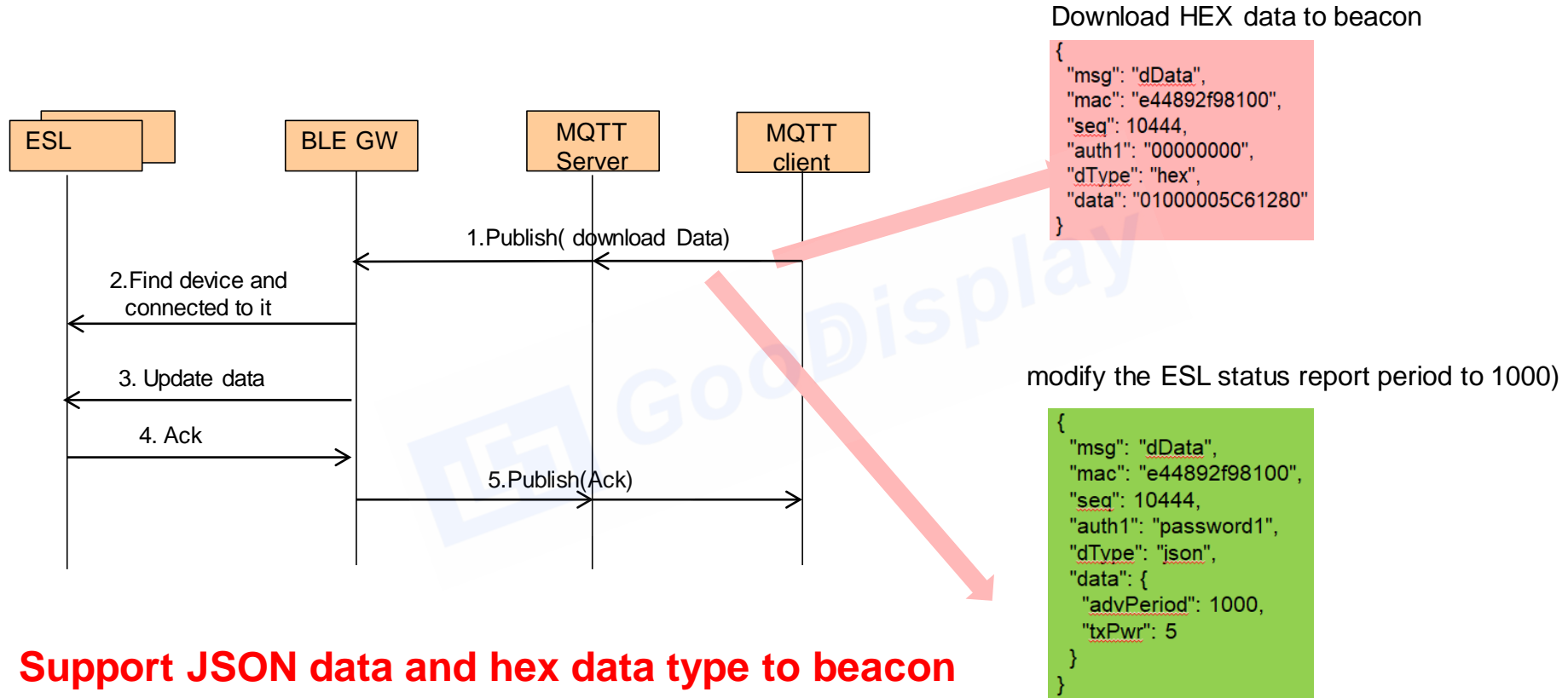
III. Open API Example--- ESL monitor



advData packet example

```
{
  "msg": "advData",
  "gmac": "66E865E28547",
  "obj": [
    {
      "dmac": "B45D0196FFFF",
      "rssi": "-53",
      "data1": "0201060302E0FF03095446"
    },
    {
      "dmac": "8D0389AB78CC",
      "rssi": "-92",
      "data1": "020106030202180AFF4B4D028D0389AB78CC"
    },
  ],
  "seq": 5091
}
```

III. Open API Example--- ESL update



Support JSON data and hex data type to beacon

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Connection the ESL using app



↔
Open API



ESL Demo

Sort	+
KESL	
rssil:-62dBm	voltage:3273mV picID:0
type:42_3color	mac:CA:02:73:E3:64:C4 temp:16°C
KESL	
rssil:-97dBm	voltage:3050mV picID:123
type:42_3color	mac:84:55:01:0A:33:DD temp:14°C
KESL	
rssil:-98dBm	voltage:3050mV picID:123
type:42_3color	mac:87:55:01:0A:33:DD temp:14°C
KESL	
rssil:-102dBm	voltage:3007mV picID:0
type:42_1color	mac:45:38:00:0A:33:DD temp:17°C
KESL	
rssil:-76dBm	voltage:3140mV picID:487
type:21_1color	mac:45:38:00:0A:33:DD temp:19°C
KESL	
rssil:-71dBm	voltage:3050mV picID:123
type:42_3color	mac:83:55:01:0A:33:DD temp:12°C
KESL	
rssil:-91dBm	voltage:3019mV picID:1454
type:42_1color	mac:86:35:00:0A:33:DD temp:16°C

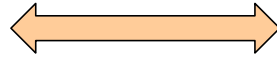
Done Title

Log info:
Connection setup complete.
Connection authentication succes, now downloa...
Downdata complete, time:3.0 Sec.

Download data

- The ESL support Bluetooth 4.1 and Bluetooth 5.0, You can use iPad / iPhone to connect with ESL for updates.
- We can provide the Bluetooth API for manage the ESL.
- We also provide IOS demo app for your quick development. Please noticed that the phone/iPad must support Bluetooth 4.1 or Bluetooth 5.0.

Connection the ESL to your device via BLE



Bluetooth API



raspberry pi



Surface pc

- The ESL support Bluetooth 4.0/4.1/4.2/5.0, You can use all BLE4/BLE5 compatible device to connect it.