1. Product introduction

Genitop ESL provides WIFI function enables large-scale network connection, which diverse into services such as real time price management for store, and also information transmission for advertisement, PR, and sales.

1.1 What is the ESL?

ESL represents Electronic Shelf Label, which is an electronic label that can be installed on the shelf. It is a label with a liquid screen for item display, instead of the traditional paper display. The information on the screen is transmitted from the server, the screen display items such as product’s name, price, logo, bar code, production area, etc. The ESL system can be managed and maintained easily by an operator in a specific area of the market. You may manage the product information on the ESL via the terminal control system on a computer, the ESL will update in real time as the update start.

1.2 How does the ESL system work?

The ESL system is consisted of input device, host computer, router device, repeater device and ESL display device. Step one, the user needs to input information for product into the database server, either by manual input or scanner device. Step two, the server will give command and information to various repeater set in the market or warehouse, each repeater controls a group of ESLs, the repeater than will transmit the information from the server to each every ESLs via RF. Last step, each ESL will receive information and send a feedback message to repeater and eventually to the server. If the feedback is correct, ESL will finally update its new item information, if failed, the server will alarm and prompt to update again.

1.3 What is the major function of ESL?

(1) Real time price update
   - Easily change price of one or all product by accessing the server terminal.
   - Product price may become fully synchronized with POS server database by remote control.
   - The user may display different price information such as promoting price, unit price, regular price, etc.

(2) Storage management
   - The user may obtain the location and stockpile of an item.
   - Real time transmission for advertisement, event and discount.
1.4 What is the advantage of the ESL?

(1) Reasonable design
- Simple and apparent ESL display design.
- Convenient operation mode.
- Low power consumption and larger capacity the battery.

(2) A high level of customer satisfaction
- Eliminate customer complaints about price difference and error.
- It may respond to market demand immediately when needed.
- Convenient storage management.

(3) Personnel expense reduction
- Great reduce labor numbers for label exchange.
- Great reduce labor cost and efficiency due to label lost and label exchange error.

(4) Profitability improvement
- High efficient storage management via internet control.
- It is possible to take a instant action due to real time information transmission.
- No compensation expenses from wrong display.

(5) High performances of the system
- Immediate ESL data update
- High efficient network communication, no delay, low package loss rate, fault-tolerant processing mechanism.
- High stabilization.

2. System structure and configuration

2.1 The system’s structure

The entire system can be divided into three parts, which is frontal display, server data processing & command control; and wireless communication.

(1) Frontal display

This part is mainly about display item information onto ESL.

(2) Server data processing & command control

Mainly two functions. Record data sent for ESL display, eventually for storage management; one is record the commodities’ information into the store management system; Command and update information to ESL.
(3) Wireless communication

We transmit data mainly via wireless communication, when the control system send a command to update product information, it is first send to router by wifi, then to repeater, and finally transmit to each ESL tag by RF.

The system structure’s drawing as follow:

2.2 Characteristic

- WIFI and RFID technology based.
- Highly reliable large-scale bidirectional communication system application
- Quick update based on high-speed communication.
- Easy and fast installation, convenient and stable operating system.
- Main item for ESL system: ESL tag (GTI-ESL20), Repeater (GTI-R128), Price update terminal (GTI-P1/2), ESL server, storage management system, POS

2.3 Detail parameters

(1) GTI-ESL20 (ESL tag)

You can alter information such as brand name, item code, production area, unit price and discounted price. This system can be applied to many fields including health, market, warehouse, cosmetics, and home appliances.
The main parameters include:

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Font standard</td>
<td>Chinese, English, European language, Arabic, etc (cover 174 countries)</td>
</tr>
<tr>
<td>Bar code</td>
<td>EAN-13; CODE128</td>
</tr>
<tr>
<td>RF Transfer</td>
<td>2.4G; distance: 20~50m</td>
</tr>
<tr>
<td>Battery Specification</td>
<td>CR2450 X2; 3.0V; 600ma/h</td>
</tr>
<tr>
<td>LCD Type</td>
<td>Bistable LCD, Resolution: 192x100, Zero-power consumption to keep the display information</td>
</tr>
<tr>
<td>Outline Dimension</td>
<td>4x23mm (2 inch)</td>
</tr>
<tr>
<td>Contrast</td>
<td>10 (8～15)</td>
</tr>
<tr>
<td>Viewing Angle</td>
<td>160° (-80° ~ +80°)</td>
</tr>
<tr>
<td>Color</td>
<td>Black/Golden, White/Blue, White/Green</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>-20° C ~ +60° C</td>
</tr>
<tr>
<td>Size</td>
<td>69mm X 37 mm X 8mm (Does not contain the cell thickness)</td>
</tr>
<tr>
<td>Service life</td>
<td>Long working life to 3~5 years</td>
</tr>
</tbody>
</table>

(2) GTI-R128 (Repeater)
- One Repeater can control max. 128 tags.
- Network control: Label position configuration, price/image data communication.
- Label control: Label price database maintenance, price label control

The main parameters include:

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication protocol</td>
<td>Bi-direction communication protocol</td>
</tr>
<tr>
<td>Number of GIT-R128 Cover</td>
<td>Each covers 128 ESLs</td>
</tr>
<tr>
<td>Covered distance</td>
<td>100~200m</td>
</tr>
<tr>
<td>Size</td>
<td>124mmx74mmx24mm</td>
</tr>
<tr>
<td>Weight</td>
<td>0.8Kg</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>-20° C ~ +60° C</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>+5 V</td>
</tr>
<tr>
<td>Port</td>
<td>WIFI, RS-485</td>
</tr>
</tbody>
</table>