**SMART POWER PLUS LED INDICATION v2.0 USER MANUAL**

**Device Model**: ESAI - 06-08-2025  
**LED Support**: Dual RGB LED (3-color: Red, Green, Blue)

Smart Power Plus uses two RGB LEDs to visually indicate various operational, connectivity, and service states. The device features:

1. **LED-1: Operational Status LED**  
   This LED shows the operational connectivity and cloud interaction status of the device. Indicates Wi-Fi connectivity, Internet availability, and cloud data status.
2. **LED-2: Configuration & Diagnostics LED**  
   Provides visual feedback for provisioning, reset, OTA update, service mode, and draining.

## Power ON & Wi-Fi Provisioning (First-Time Setup)

**Event:**

* Device is powered using 230V AC.
* Internal controller (MCU) boots.
* Wi-Fi Hotspot (Access Point mode) is launched.

**User Action:**

* Open the mobile provisioning app.
* Scan and connect to the visible SPP device (e.g., E\_AA\_Z\_A\_Z\_P0001\_D1).
* Select SSID and enter the Wi-Fi password.

**LED Behavior:**

* **LED-1:** OFF
* **LED-2:** 🔄 **Green blink** (1 sec interval)  
  *Indicates the device is ready for provisioning.*

## Wi-Fi Connection Status After Provisioning

**Event:**

* Provisioning is successful; device attempts to connect to Wi-Fi.

**LED Behavior (based on signal strength):**

* **Wi-Fi Signal ≥ 60%**
  + **LED-1:** 🟢 **Solid Green**  
    *Strong, stable Wi-Fi connection.*
* **Wi-Fi Signal < 60%**
  + **LED-1:** 🟢🔴 **Alternate Green & Red blink** (1 sec interval)  
    *Weak signal warning.*
* **Buzzer: horn for 1 sec**
* **LED-2:** OFF

## Cloud Connectivity & Data Push to AWS IoT

**Event:**

* Device sends telemetry data to AWS IoT Core.

**LED Behavior (based on success & signal):**

* **Wi-Fi OK + Data Push Successful:**
  + **LED-1:** 🟢🔵 **Alternate Green & Blue blink** (1 sec interval)  
    *Live data successfully sent.*
* **Wi-Fi Weak + Data Push Successful:**
  + **LED-1:** 🟢🔴🔵 **Sequence: Green → Red → Blue** (1 sec each)  
    *Indicates data push is okay, but Wi-Fi is weak.*
* **Wi-Fi Connected but Internet Not Available:**
  + **LED-1:** 🔴 **Red blink** (1 sec)  
    *Connected to Wi-Fi but cloud is unreachable.*
* **Wi-Fi Disconnected:**
  + **LED-1:** 🔴 **Red blink** (1 sec)  
    *Wi-Fi offline, no cloud access.*
* **LED-2:** OFF

## Draining Mode (Offline Recovery → AWS Sync)

**Event:**

* Device was offline earlier for a period of time, stored data to SD card.
* Now reconnects to Wi-Fi and starts pushing saved data to cloud first then continue with live stream.

**LED Behavior:**

* **LED-1:** Same as normal live-data push (as per Wi-Fi strength).
* **LED-2:** 🔵 **Blue blink** (1 sec)  
  *Indicates “draining” mode is active.*

## Wi-Fi Reset Mode

**Event:**

* User presses the mini push-button for **>3 seconds**.
* Resets Wi-Fi credentials and restarts provisioning.
* **Buzzer: horn with 1 sec interval**

**LED Behavior:**

* **LED-1:** OFF
* **LED-2:** 🔴🟢 **Alternate Red & Green blink** (1 sec)  
  *Wi-Fi reset in progress.*

## Force OTA Firmware Update Mode

**Event:**

* User presses the mini push-button for **>10 seconds**.
* Device checks for OTA update and applies if available.
* **Buzzer: horn with 3 sec intervals**

**LED Behavior:**

* **LED-1:** OFF
* **LED-2:** 🔵🟢 **Alternate Blue & Green blink** (1 sec)  
  *OTA update check and execution.*

## Service / Diagnostics Mode (Hardware or Config Fault)

**Event:**

* Device enters internal fault or diagnostic mode.

**LED Behavior:**

* **LED-1:** OFF
* **LED-2:** 🔴 **Red blink** (1 sec)  
  *Indicates a hardware fault or service attention required.*

## LED Indication Reference Table

|  |  |  |
| --- | --- | --- |
| **Condition / Event** | **LED-1 (Operational)** | **LED-2 (Config & Diagnostics)** |
| Device Powered ON | OFF | Green blink (1 sec) |
| Wi-Fi Connected (Good Signal ≥ 60%) | Solid Green | OFF |
| Wi-Fi Connected (Weak Signal < 60%) | Green & Red alternate blink (1 sec) | OFF |
| Data Push Success + Good Wi-Fi | Green & Blue alternate blink (1 sec) | OFF |
| Data Push Success + Weak Wi-Fi | Green → Red → Blue sequence (1 sec each) | OFF |
| Internet Not Available | Red blink (1 sec) | OFF |
| Wi-Fi Disconnected | Red blink (1 sec) | OFF |
| Draining Mode (SD → Cloud) | Same as above | Blue blink (1 sec) |
| Wi-Fi Reset (Button > 3 sec) | OFF | Red & Green alternate blink (1 sec) |
| OTA Firmware Update (Button > 10 sec) | OFF | Blue & Green alternate blink (1 sec) |
| Service / Diagnostic Fault | OFF | Red blink (1 sec) |

## Notes for Users:

* **Always** ensure Wi-Fi strength is above 60% for reliable data push.
* **Use long press reset** only when you change Wi-Fi or move device.
* **Watch LED-2** closely during startup and maintenance.
* **Draining mode** automatically handles cloud sync for offline periods.
* Firmware update will reboot the device automatically.

# Smart Power Plus – LED Indication Quick Guide Card

**⚡ SMART POWER PLUS**

**LED INDICATION QUICK GUIDE**  
*(Dual RGB LED: RED, GREEN, BLUE only)*

|  |  |  |
| --- | --- | --- |
| **Device Event** | **LED-1 (Operational)** | **LED-2 (Config / Diagnostics)** |
| 🔌 **Power ON – Hotspot Ready** | OFF | Green blink (1s) – Wi-Fi provisioning |
| 📶 **Wi-Fi Connected (Good Signal)** | Solid Green | OFF |
| 📶 **Wi-Fi Connected (Weak Signal)** | Green ↔ Red blink (1s) | OFF |
| ☁️ **Data Push Success (Good Wi-Fi)** | Green ↔ Blue blink (1s) | OFF |
| ☁️ **Data Push Success (Weak Wi-Fi)** | Green → Red → Blue (1s each) | OFF |
| 🌐 **No Internet** | Red blink (1s) | OFF |
| ❌ **Wi-Fi Disconnected** | Red blink (1s) | OFF |
| 💾 **Draining Mode** (SD → AWS) | Same as above | Blue blink (1s) |
| 🔁 **Wi-Fi Reset (Press >3s)** | OFF | Red ↔ Green blink (1s) |
| ⬇️ **OTA Update (Press >10s)** | OFF | Blue ↔ Green blink (1s) |
| 🛠 **Service / Fault Mode** | OFF | Red blink (1s) |

**📲 First-Time Setup:**

1. Power the device via 230V AC.
2. Wait for **LED-2: Green blinking** (Hotspot Ready).
3. Open the provisioning mobile app.
4. Select your SPP device (e.g., SPPA00001).
5. Enter Wi-Fi details and complete setup.

**⚠️ LED Behavior Legend:**

* **Blink** = ON 1s → OFF 1s (slow blink)
* **Alternate Blink** = Colors change every second
* **Sequence Blink** = Green → Red → Blue, 1s each
* **Solid** = LED always ON (no blink)

**🔧 Use With Care:**

* Press button >3s to reset Wi-Fi.
* Press button >10s to check for OTA update.
* Device auto-recovers offline data (Draining Mode).
* Red LED on LED-2 = Device requires service.

**🏷️ Ideal for Placement:**

* 📍 Inside device door panel
* 📍 Near Wi-Fi router
* 📍 On meter board (if installed in electrical panels)