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SLN-IOT-GPI: Integrated Development Experience for IoT Systems

The SLN-IOT-GPI is a complete development platform for building secure IoT systems. It offers a pre-integrated configuration for hardware, software, connectivity, security, cloud services and NFC commissioning for popular IoT use cases. This solution platform speeds time-to-market, reduces risks associated with wireless connectivity and saves development costs in demanding commercial installations of large node networks (LNNs).

OVERVIEW

The SLN-IOT-GPI Integrated Development Experience (IDEx) combines the NXP Modular IoT Gateway supporting simultaneous ZigBee and Thread connectivity controlled by the energy efficient i.MX6UL processor and a Modular Edge Node controlled by a wireless SoC.

The optimized hardware is supported with pre-integrated production-ready Linux® and FreeRTOS-based BSPs. Out-of-the-box low-power wireless mesh connectivity, NFC-based commissioning and state-of-the-art security capabilities provide a solutions platform that is ideal for connected applications which need to combine management and control of large node networks with cloud connectivity.

Edge nodes can exchange data with the gateway through ZigBee or Thread and the gateway delivers data to the cloud over Ethernet or Wi-Fi®. An Android or iOS phone app enables users to easily set up their system, then monitor and control the edge nodes.

The provided level of hardware and software modularity offers developers the flexibility required to quickly build and iterate a range of potential IoT use-case-specific applications leveraging various configurations.

TARGET APPLICATIONS

- ▶ Smart Cities
- ▶ Lighting
- ▶ Building Automation
- ▶ Agriculture
- ▶ Oil/Gas

SIMPLIFIED NFC COMMISSIONING FOR LARGE NODE NETWORKS

Commercial installations with thousands of nodes can leverage the built-in secure NFC tap-to-connect capabilities through the gateway. Using a smartphone application, end nodes can be quickly and securely commissioned to the network, even when the device that is being installed is not powered, which is common in smart buildings and industries, smart connected cities, oil and gas fields and agriculture installations.



SLN-IOT-GPI IDEX FEATURES

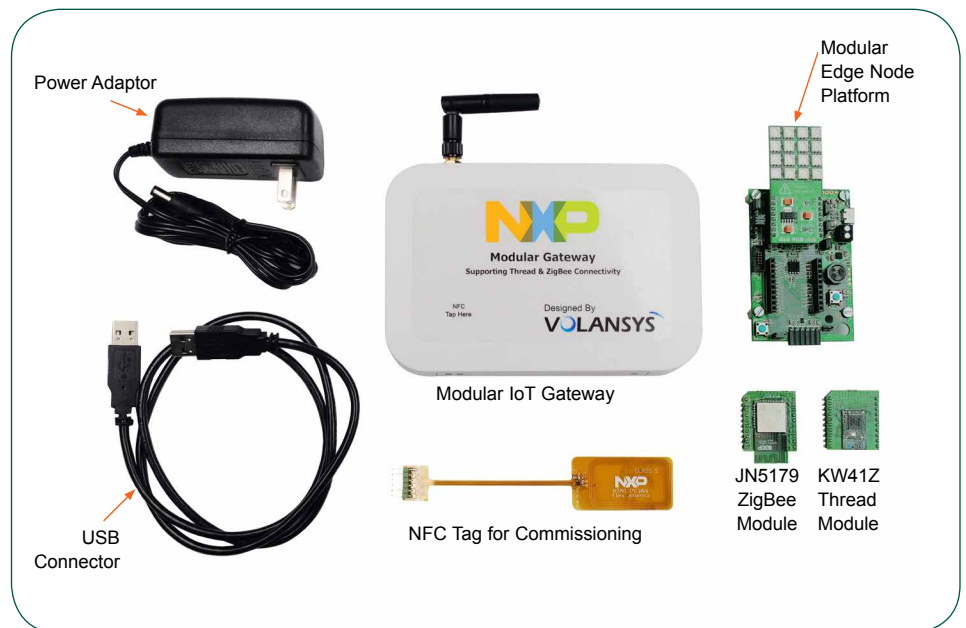
The SLN-IOT-GPI IDEx includes hardware and software, drivers, protocol and connectivity stacks as well as Linux BSP support.

- ▶ FCC/CE/IC certified
- ▶ Multi-protocol support for Thread, ZigBee, Wi-Fi and Ethernet
- ▶ Supports large node networks (>= 250 nodes)
- ▶ Commissioning through NFC and Smart App
- ▶ Wi-Fi and Ethernet northbound to the cloud
- ▶ Over-the-air programming via Multicast
- ▶ Smartphone app support
- ▶ i.MX6UL SOM
- ▶ Kinetis® KW22D512 or KW41Z Thread microcontroller
- ▶ JN5179 ultra low power ZigBee 3.0 and IEEE802.15.4 Module
- ▶ PN7120 NFC controller
- ▶ A70CM secure element

DOCUMENTATION TABLE

| |
|--|
| Out of the Box Set up Guide |
| Hardware and Software User's Guides |
| Module Data Sheets |
| Firmware Flashing Guides |
| Source build Instruction Guides |
| Design Package (schematics, layout, BOM) |
| Enclosure Design Files |

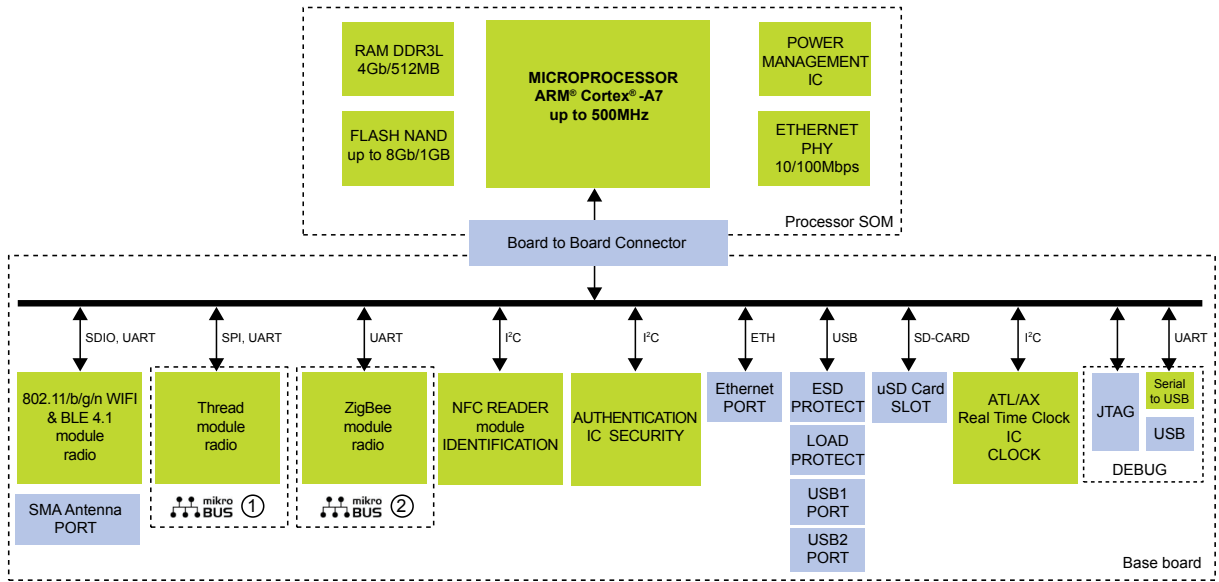
FIGURE 1: SLN-IOT-GPI: IDEX FOR GENERAL PURPOSE IOT SYSTEMS



SOFTWARE AND TOOLS TABLE

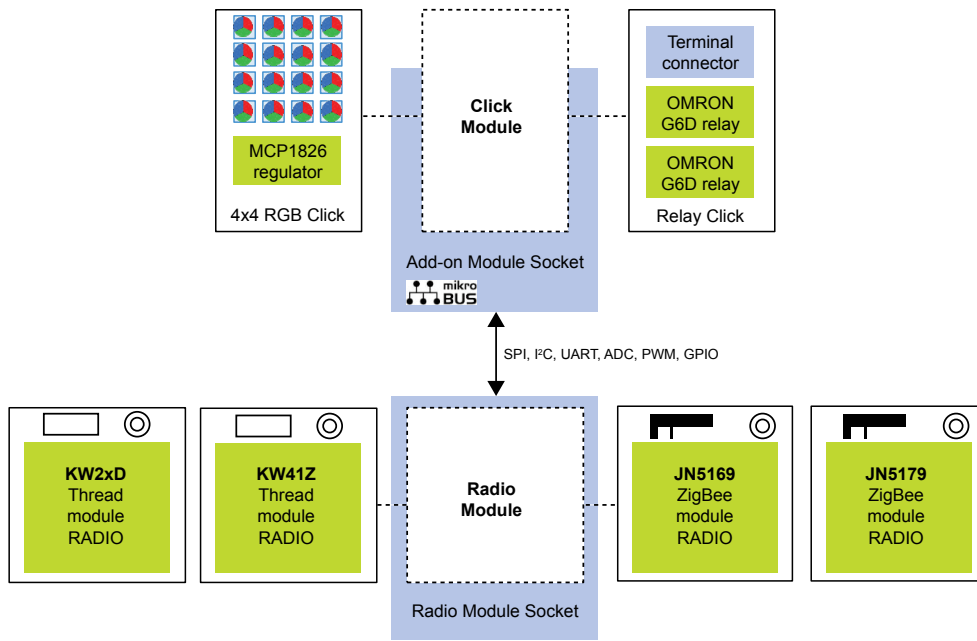
| SLN-IOT-GPI IDEX SOFTWARE | DEVICE |
|---|-----------------------|
| Linux® Yocto BSP with full drivers and connectivity | i.MX6UL MCUs |
| MQTT client library | i.MX6UL MCUs |
| Thread Linux host software SDK | i.MX6UL MCUs |
| Gateway and end device registration with cloud | i.MX6UL MCUs |
| Start-up script for Wi-Fi® client service | i.MX6UL MCUs |
| Config file to load Wi-Fi firmware | i.MX6UL MCUs |
| Controls front panel LEDs | i.MX6UL MCUs |
| Communication bridge between cloud and end device | i.MX6UL MCUs |
| NFC commissioning of gateway and end devices | i.MX6UL MCUs |
| Thread end device controller | i.MX6UL MCUs |
| ZigBee end device controller | i.MX6UL MCUs |
| Black box Thread stack for KW41Z on gateway | Kinetis W series MCUs |
| Black box ZigBee stack for JN on gateway | JN MCUs |
| Black box stack for NFC on gateway | PN7120 NFC controller |
| SMARTPHONE APP SOFTWARE | |
| Pre-compiled Android and iOS applications to manage gateway | Smartphone |
| END DEVICE FIRMWARE | |
| MENP-KW41Z, MENP-KW22D, MENP-JN5179, MENP-JN5169, FRDM-K64F+MCR20, FRDM-KW41Z, FRDM-KW22D | Multiple |

Modular IoT Gateway



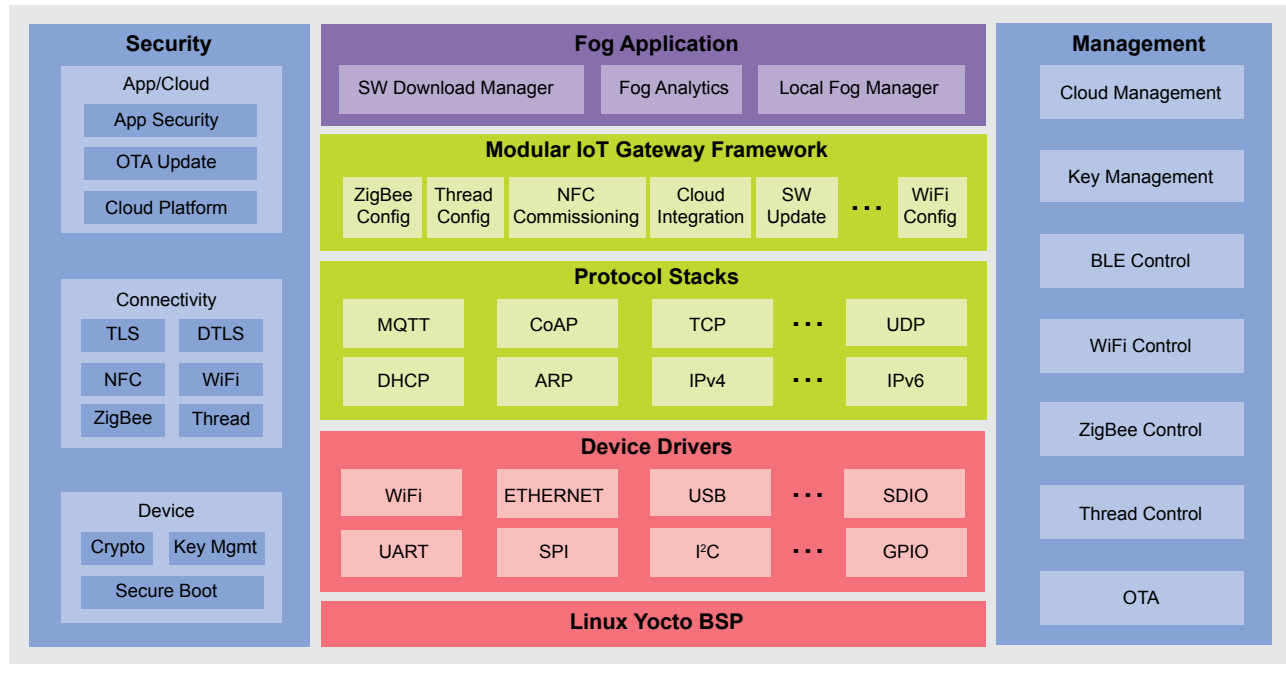
Component Interface

Modular Edge Node Platform



Component Interface

Modular IoT Gateway



Modular Edge Node Platform—Thread

