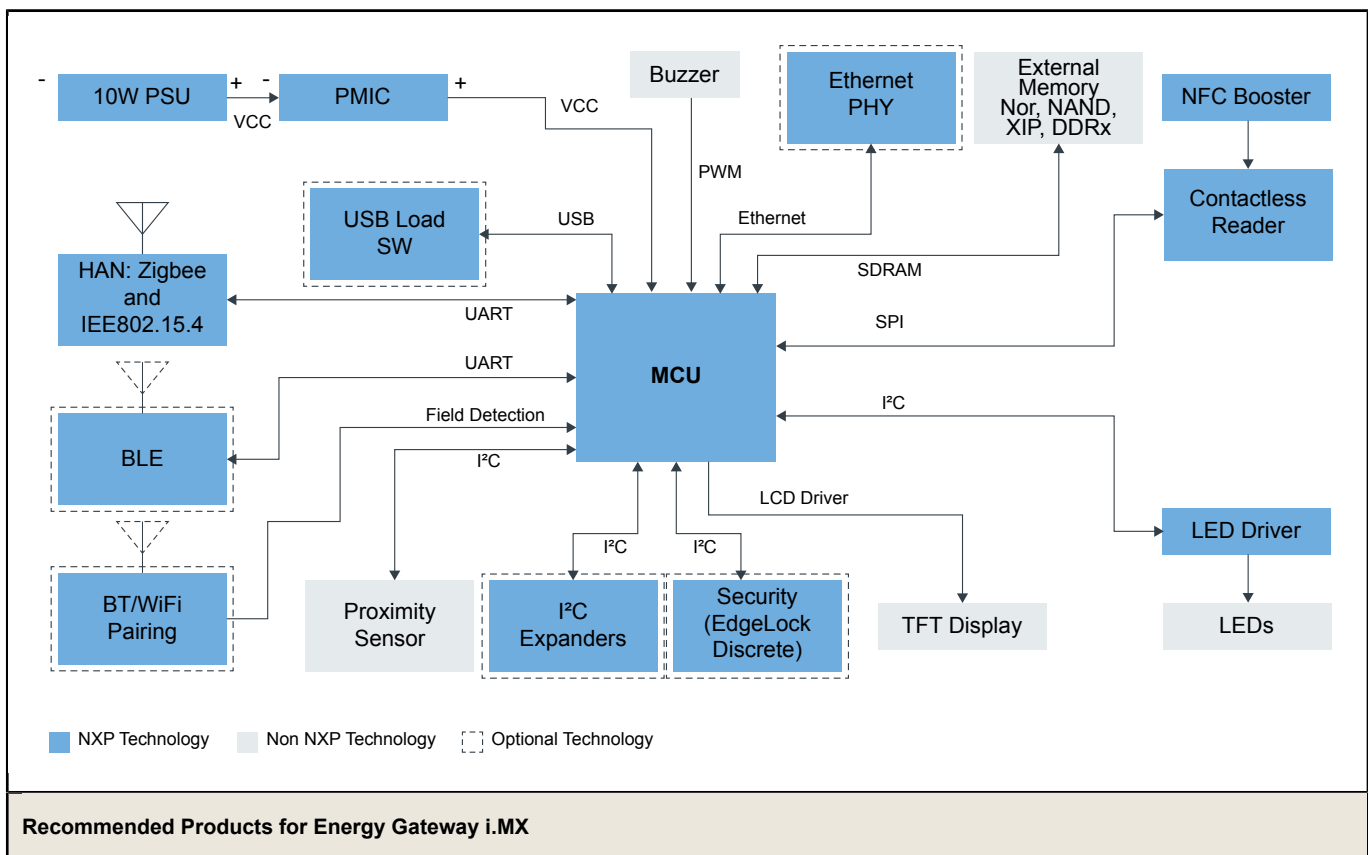# Energy Gateway

Last Updated: Dec 13, 2023

To achieve better service and smarter, streamlined processes, energy providers require reliable, real-time access to data. NXP® products help data concentrators or energy gateways create the necessary infrastructure to gather data from different sensors and utility meters, upload it to the central utility server, and show it to the user. The energy gateway synchronizes time and date data of utility meters to the central utility server and enables secure data transfer of user authentication and encryption information.
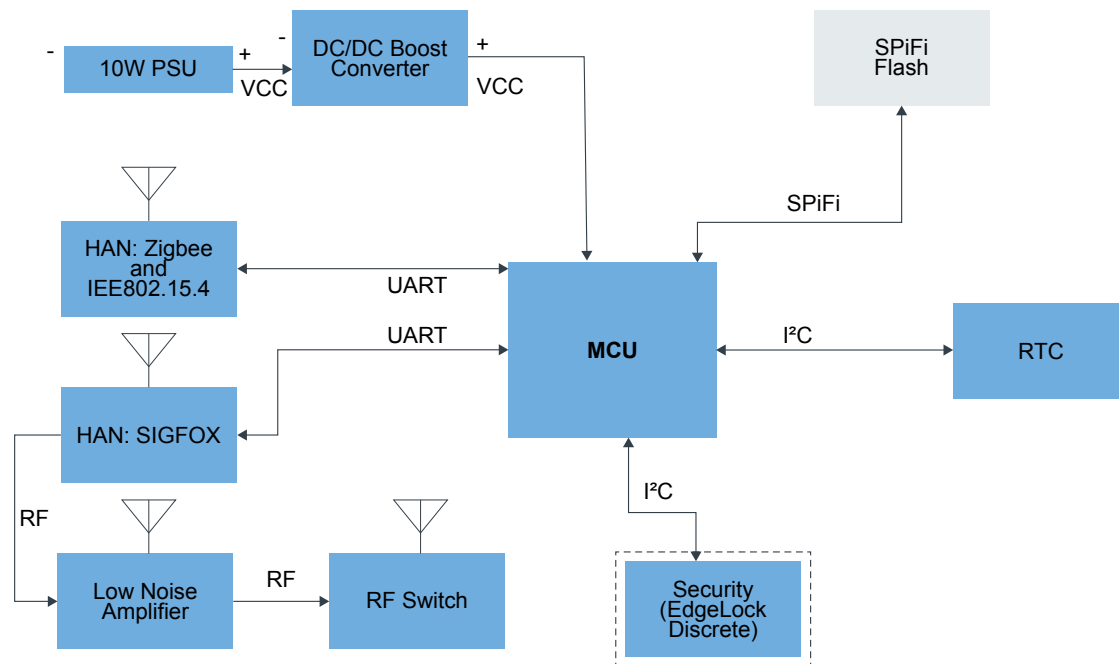
Communication to sensors uses RF technology such as ZigBee, Sigfox, and Bluetooth Low Energy.

Energy Gateway i.MX Block Diagram

Recommended Products for Energy Gateway i.MX

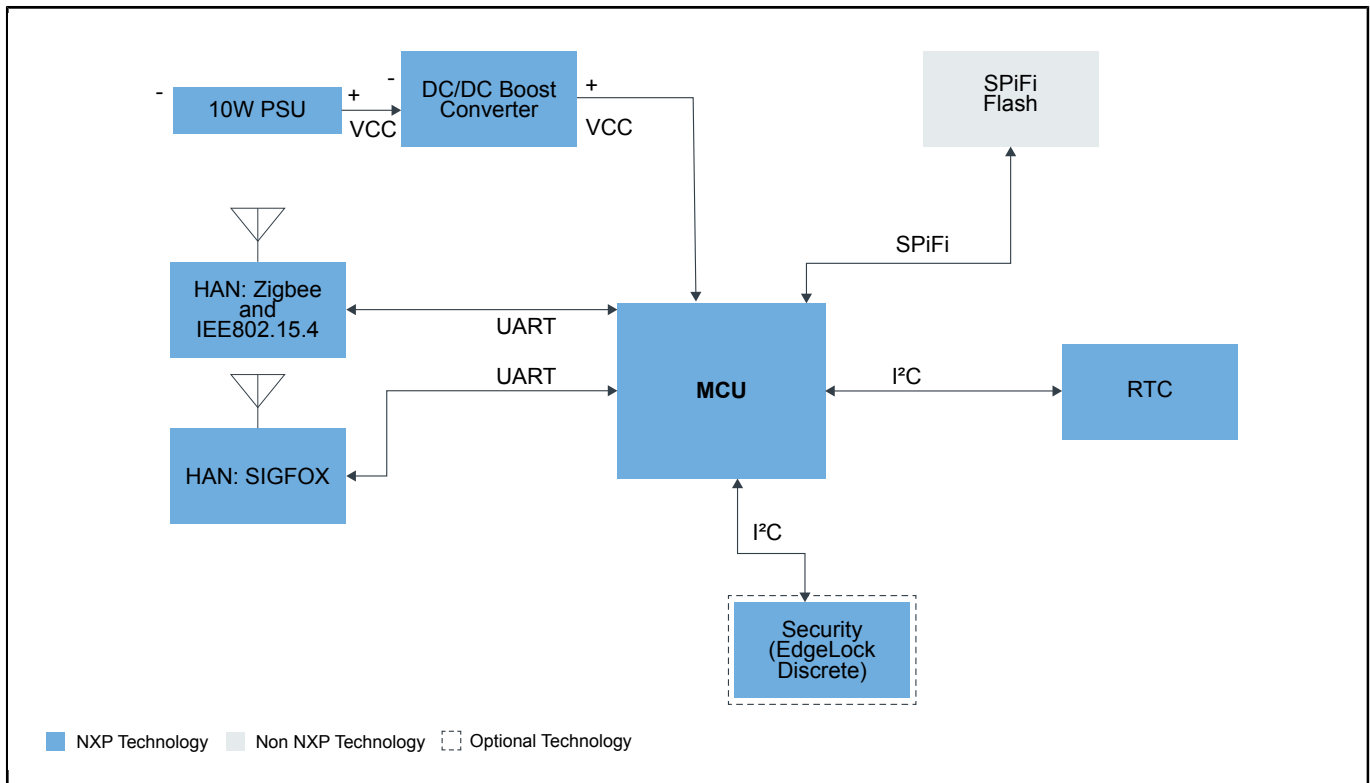|	
MCU	• i.MX6UL: i.MX 6UltraLite Processor - Low-Power, Secure, Arm® Cortex®-A7 Core • i.MX6S: i.MX 6Solo Processors – Single-Core, Multimedia, 3D Graphics, Arm® Cortex®-A9 Core
Power Management	• TEA1721DT: HV Start-up Flyback Controller with Integrated MOSFET for 5 W Applications, F~Burst = 1270 Hz • PF3001: 10-Channel Configurable PMIC for i.MX6 and i.MX7 Application Processors
Wireless	• JN5169: ZigBee and IEEE802.15.4 Wireless Microcontroller with 512 KB Flash, 32 KB RAM • NTAG213F, NTAG216F: NFC Forum Type 2 Tag Compliant IC with 144/888 B User Memory and Field Detection • QN908x: Ultra-Low-Power Bluetooth Low Energy System on Chip Solution • 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution • 88W8977: 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution
Drivers	• NX5P3290UK: USB PD and Type-C Current-Limited Power Switch • PCA9626: 24-Bit Fm+ I²C-Bus 100 MA 40 V LED Driver • PCAL6408A: Low-Voltage Translating, 8-Bit I²C-Bus/SMBus I/O Expander
NFC	• PCA9410_9410A: 3.0 MHz, 500 MA, DC-to-DC Boost Converter • PN5190: NFC Frontend supporting challenging RF environment for payment, physical access control
Drivers	• NX5P3290UK: USB PD and Type-C Current-Limited Power Switch • PCAL9722: 22-Bit SPI I/O Expander with Agile I/O Features • PCAL9714: 14-Bit SPI I/O Expander with Agile I/O Features • PCA9626: 24-Bit Fm+ I²C-Bus 100 MA 40 V LED Driver • PCAL6408A: Low-Voltage Translating, 8-Bit I²C-Bus/SMBus I/O Expander
Wireless	• JN5169: ZigBee and IEEE802.15.4 Wireless Microcontroller with 512 KB Flash, 32 KB RAM • NTAG213F, NTAG216F: NFC Forum Type 2 Tag Compliant IC with 144/888 B User Memory and Field Detection • QN908x: Ultra-Low-Power Bluetooth Low Energy System on Chip Solution • 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution • 88W8977: 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution
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Drivers	• NX5P3290UK: USB PD and Type-C Current-Limited Power Switch • PCA9626: 24-Bit Fm+ I²C-Bus 100 MA 40 V LED Driver • PCAL6408A: Low-Voltage Translating, 8-Bit I²C-Bus/SMBus I/O Expander
Transceiver	• TJA1101: TJA1101B, IEEE 100BASE-T1 Complaint Automotive Ethernet PHY Transceiver
Security (EdgeLock Discrete)	• EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility

Energy Gateway LPC Block Diagram

Legend: ■ NXP Technology　□ Non NXP Technology　⌐ ¬ Optional Technology

Diagram blocks and connections:
- 10W PSU → DC/DC Boost Converter (VCC, + / -)
- DC/DC Boost Converter → MCU (VCC, +)
- HAN: Zigbee and IEE802.15.4 ↔ MCU (UART)
- HAN: SIGFOX ↔ MCU (UART)
- Low Noise Amplifier → RF Switch (RF)
- HAN: SIGFOX → Low Noise Amplifier (RF)
- MCU → SPiFi Flash (SPiFi)
- MCU ↔ RTC (I²C)
- MCU ↔ Security (EdgeLock Discrete) (I²C)

Recommended Products for Energy Gateway LPC	
MCU	• LPC540XX: Power-Efficient Microcontrollers (MCUs) with Advanced Peripherals Based on Arm® Cortex®-M4 Core
Power Management	• PCA9410_9410A: 3.0 MHz, 500 MA, DC-to-DC Boost Converter • TEA1721DT: HV Start-up Flyback Controller with Integrated MOSFET for 5 W Applications, F~Burst = 1270 Hz
Wireless	• OL2385AHN: Low-Power Multi-Channel UHF RF Wireless Platform • 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution • 88W8977: 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution • JN5169: ZigBee and IEEE802.15.4 Wireless Microcontroller with 512 KB Flash, 32 KB RAM • BGS8L5: SiGe:C LNA LTE Bypass
Wireless	• OL2385AHN: Low-Power Multi-Channel UHF RF Wireless Platform • JN5169: ZigBee and IEEE802.15.4 Wireless Microcontroller with 512 KB Flash, 32 KB RAM • BGS8L5: SiGe:C LNA LTE Bypass • 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution • 88W8977: 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution
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	• **88W8977**: 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution
Security (EdgeLock Discrete)	• **EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility**
RTC	• **PCF2129**: Accurate RTC with Battery Backup

Energy Gateway LPC Basic Block Diagram

Recommended Products for Energy Gateway LPC Basic	
MCU	• **LPC540XX**: Power-Efficient Microcontrollers (MCUs) with Advanced Peripherals Based on Arm® Cortex®-M4 Core
Security (EdgeLock Discrete)	• **EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility**
Wireless	• **JN5169**: ZigBee and IEEE802.15.4 Wireless Microcontroller with 512 KB Flash, 32 KB RAM • **OL2385AHN**: Low-Power Multi-Channel UHF RF Wireless Platform • **2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution** • **88W8977**: 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 4 (802.11n) + Bluetooth® 5.2 Solution
ENERGY-GATEWAY-BD3-BNDL2	• **PCA9410_9410A**: 3.0 MHz, 500 MA, DC-to-DC Boost Converter • **TEA1721DT**: HV Start-up Flyback Controller with Integrated MOSFET for 5 W Applications, F~Burst = 1270 Hz
Power Management	• **PCA9410_9410A**: 3.0 MHz, 500 MA, DC-to-DC Boost Converter • **TEA1721DT**: HV Start-up Flyback Controller with Integrated MOSFET for 5 W Applications, F~Burst = 1270 Hz

Wireless	• JN5169: ZigBee and IEEE802.15.4 Wireless Microcontroller with 512 KB Flash, 32 KB RAM
	• OL2385AHN: Low-Power Multi-Channel UHF RF Wireless Platform
	• 2.4/5 GHz Dual-Band 1x1 Wi-Fi$^®$ 4 (802.11n) + Bluetooth$^®$ 5.2 Solution
	• 88W8977: 2.4/5 GHz Dual-Band 1x1 Wi-Fi$^®$ 4 (802.11n) + Bluetooth$^®$ 5.2 Solution
RTC	• PCF2129: Accurate RTC with Battery Backup

View our complete solution for Energy Gateway.

Note: The information on this document is subject to change without notice.