



Energy Management System

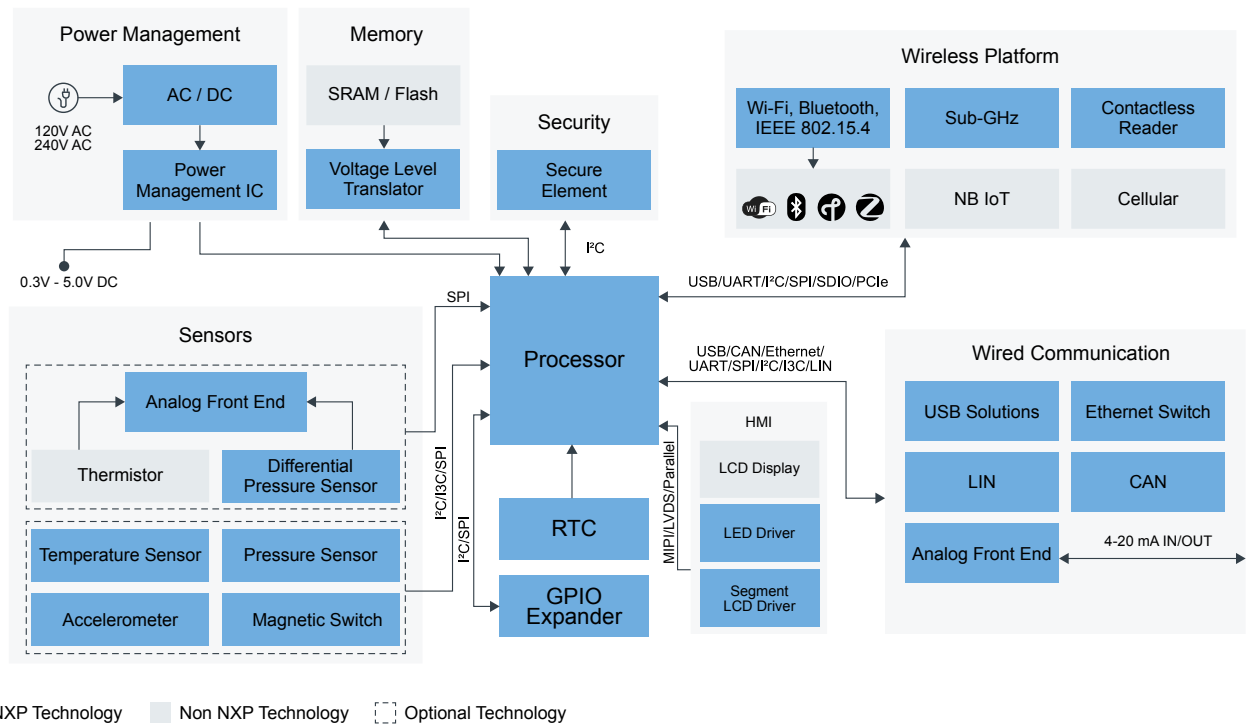
Last Updated: Feb 26, 2025

An Energy Management System (EMS) is an integral component to attain energy efficiency and sustainability for homes, buildings and microgrids that integrate a variety of distributed energy resources (DER), for example, solar panels, wind turbines, conventional electricity generators and energy storage systems (ESS). It coordinates with the public grid to balance the load and prioritizes on-site energy distribution.

NXP's advanced technologies facilitate development of systems that:

- Autonomously monitor and optimize operating costs
- Reliably balance real-time energy flow to and from the macro grid
- Robustly and securely connect on- and off-site equipment

Energy Management - Advanced Block Diagram



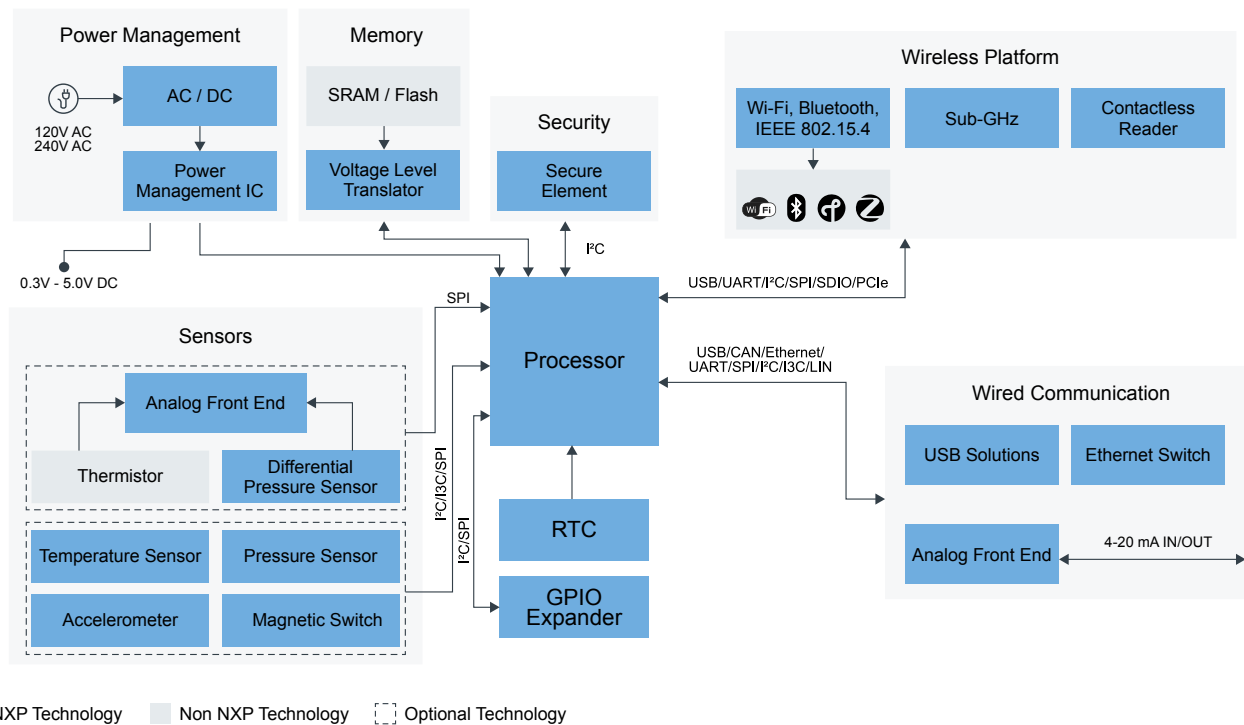
Recommended Products for Energy Management - Advanced

Power Management IC	<ul style="list-style-type: none"> • PF09: 9-Channel PMIC for High-Performance Applications, ASIL D and SIL-2 • PCA9451A: PCA9451A Power Management IC for i.MX 93x/91x Application Processor • PCA9450: Power Management IC (PMIC) for i.MX 8M Mini/Nano/Plus
AC/DC	<ul style="list-style-type: none"> • TEA1723DT: HV Start-up Flyback Controller with Integrated MOSFET for 11 W Applications, F-Burst = 1270 Hz
Voltage Level Translator	<ul style="list-style-type: none"> • NTS0304E: 4-Bit Dual-Supply Translating Transceiver (Open-Drain, Auto-Direction Sensing) • NTS0308E: 8-Bit Dual-Supply Translating Transceiver (Open-Drain, Auto-Direction Sensing) • NTS0302JK: 2-Bit Dual-Supply Translating Transceiver (Open-Drain, Auto-Direction Sensing)

Analog Frontend	<ul style="list-style-type: none"> • NAFEx3388: Highly Configurable 8/4 Channel 24/16 bits ± 25 V Universal Input Analog Front-End with Excitation Sources
Differential Pressure Sensor	<ul style="list-style-type: none"> • MPXx5004: Differential and Gauge, Integrated Pressure Sensor (0 to 3.92 kPa)
Temperature Sensor	<ul style="list-style-type: none"> • P3T1084UK: I3C/I²C-Bus ± 0.4 °C Accurate Digital Temperature Sensor • P3T1755DP: I3C/I²C-Bus ± 0.5 °C Accurate Digital Temperature Sensor
Pressure Sensor	<ul style="list-style-type: none"> • MPL3115A2: Absolute Digital Pressure Sensor (20 to 110 kPa) • NBP8-9x: Highly Integrated Battery Pressure Monitor Sensor
Processor	<ul style="list-style-type: none"> • i.MX-RT1160: i.MX RT1160 Crossover MCU Dual-Core Arm[®] Cortex[®]-M7 and Cortex-M4 • i.MX8MPLUS: i.MX 8M Plus – Arm[®] Cortex[®]-A53, Machine Learning, Vision, Multimedia and Industrial IoT • i.MX8MMINI: i.MX 8M Mini - Arm[®] Cortex[®]-A53, Cortex-M4, Audio, Voice, Video • i.MX93: i.MX 93 Applications Processor Family – Arm[®] Cortex[®]-A55, ML Acceleration, Power Efficient MPU
Accelerometer	<ul style="list-style-type: none"> • FXLS8974CF: $\pm 2g/\pm 4g/\pm 8g/\pm 16g$, Low-Power 12-Bit Digital IoT Accelerometer • FXLS8971CF: $\pm 2g/\pm 4g/\pm 8g/\pm 16g$, Low Power 12-Bit Digital Accelerometer
Magnetic Switch	<ul style="list-style-type: none"> • NMH1000: NMH1000 Ultra-Low Power and Low-Voltage Magnetic Switch
RTC	<ul style="list-style-type: none"> • PCF2131: Nano-Power Highly Accurate RTC with Integrated Quartz Crystal
GPIO Expander	<ul style="list-style-type: none"> • PCAL6416AHF: Low-voltage translating 16-bit I²C-bus/SMBus I/O expander • PCAL9722: 22-Bit SPI I/O Expander with Agile I/O Features
Wi-Fi, Bluetooth	<ul style="list-style-type: none"> • IW612: 2.4/5 GHz Dual-Band 1x1 Wi-Fi[®] 6 (802.11ax) + Bluetooth[®] 5.4 + 802.15.4 Tri-Radio Solution • RW612: Wireless MCU with Integrated Tri-radio: 1x1 Wi-Fi[®] 6 + Bluetooth[®] Low Energy 5.4 / 802.15.4 • MCX-W71X: MCX W71x Secure and Ultra-Low-Power MCUs for Matter, Thread, Zigbee and Bluetooth LE • MCX-W72X: MCX W72x Secure and Ultra-Low-Power MCUs for Matter, Thread, Zigbee and Bluetooth LE
LED Driver	<ul style="list-style-type: none"> • PCA9552: 16-Bit I²C-Bus LED Driver with Programmable Blink Rates
Segment LCD Driver	<ul style="list-style-type: none"> • PCF8531U: 34 X 128 Pixel Matrix Driver • PCF2119X: LCD Controllers/Drivers
Sub Gig Transceiver	<ul style="list-style-type: none"> • OL2385AHN: Low-Power Multi-Channel UHF RF Wireless Platform
USB Solutions	<ul style="list-style-type: none"> • USB Type C: USB Type-C Plug'n Play: Efficient Data and Power Delivery
Contactless Reader	<ul style="list-style-type: none"> • PN7220: PN7220: High-Performance, One-Chip NFC Controller for EMVCo 3.1 and NFC Forum Operation
Ethernet Switch	<ul style="list-style-type: none"> • TJA1103: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • TJA1120: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver • i.MX-RT1180: i.MX RT1180: Crossover MCU with TSN Switch and EdgeLock[®]

Secure Element	<ul style="list-style-type: none"> • SE050: EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT Security with High Flexibility • EDGELOCK-A5000: EdgeLock® A5000 Plug and Trust Secure Authenticator: Authentication Made Secure, Scalable and Easy
CAN	<ul style="list-style-type: none"> • TJA1043: High-Speed CAN Transceiver with Standby and Sleep Mode • TJA144x: Automotive CAN FD Transceiver Family
LIN	<ul style="list-style-type: none"> • TJA1020: LIN Transceiver

Energy Management – Basic Block Diagram



Recommended Products for Energy Management – Basic

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Secure Element	<ul style="list-style-type: none"> • SE050: EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT Security with High Flexibility • EDGELOCK-A5000: EdgeLock® A5000 Plug and Trust Secure Authenticator: Authentication Made Secure, Scalable and Easy
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View our complete solution for [Energy Management System](#).

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