Overview

The fast start IoT platform is a powerful enabler for IoT applications such as smart cities, smart structures, smart agriculture, machine health monitoring, and more.

The platform components are:
- Fast start sensor board
- Gateway hardware—Armadillo or Raspberry Pi
- Gateway software—a bundle of software to be run on a PC

Figure 1. Fast start platform.

The current setup uses a wired LAN connection between the gateway and the PC. This makes it a cloudy-ready system, which makes it possible that the gateway components can be extended to communicate wirelessly with a cloud system for control of the fast start nodes from any remote location.

Target Applications Include:
- Structural health monitoring
  - Systems for bridge, tunnel, and building monitoring
- Asset tracking and monitoring
  - Pallet tagging, refrigeration monitoring
- Smart agriculture
  - Crop management
- Smart energy
  - EV and UPS battery monitoring
- Smart machine
  - Monitoring equipment in factory environments
System Block Diagram

- Energy Harvester Interface
- BLIP WSN Interface
- External Sensor Interface: Example:
  - pH Sensor
  - Gas Sensor
- Multiple Debug Interface Options
- Plug and Play MikroBUS Sensor Modules (x4)
- Micro SD and Batteries on Underside of PCB

GUI

- Sensor Configuration Setting
- Measurement Cycle Setting
- Communications Cycle Setting
## Main Product Introduction

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
<th>Key Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADuCM3029</td>
<td>The ADuCM3029 is an ultra low power, integrated mixed-signal microcontroller system for processing, control, and connectivity; performs radio control and connectivity in 2.4 GHz ISM band; it is designed for operation in the global 2.4 GHz sub-GHz frequency range; RF frequency ranges: 169.4 MHz to 169.6 MHz; supports a wide range of modulation scheme and channel widths in the sub-GHz frequency range; RF frequency ranges: 169.4 MHz to 169.6 MHz; 426 MHz to 470 MHz; 863 MHz to 960 MHz; data rates; 2 (G)FSK: 0.1 kbps to 300 kbps; 4 (G)FSK: 0.1 kbps to 200 kbps (Tx only); dual PA outputs; low IF receiver with programmable IF bandwidths; 100 kHz, 150 kHz, 200 kHz, 300 kHz; receiver sensitivity (BER); −116 dBm at 1.0 kbps, 2 FSK, GFSK, −107.5 dBm at 38.4 kbps, 2 FSK, GFSK, −102.5 dBm at 150 kbps, GFSK, GMSK, −100 dBm at 300 kHz, GFSK, GMSK, −104 dBm at 19.2 kHz, 12-bit SAR analog-to-digital controller</td>
<td>High integration/ultra low power</td>
<td></td>
</tr>
<tr>
<td>ADPS090</td>
<td>ULP Boost Charger with MPPT; very low power boost regulator; hysteric controller optimize sub-mW efficiency; cold start from 10 μW at V IN = 380 mV; ultralow quiescent current; I Q (SYS) &lt; 250 nA when V IN (OCV) &gt; MINI_OP; I Q (SYS) &lt; 250 nA when V IN (OCV) &lt; MINI_OP; highly integrated auto switchover shutdown point (MIN_O) based on OCV level; OCV (open circuit voltage) sensing MPPT; programmable MPPT ratio for PV or TEG; support optional backup battery power path; manage primary battery for continuous operation; energy storage management; programmable charging termination voltage and shutdown voltage level to prevent over charging and over discharging; continuous over discharging; over charging over discharging</td>
<td>High efficiency, small package</td>
<td></td>
</tr>
<tr>
<td><strong>RF</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADF7023/ADF7024</td>
<td>Ultralow power, high performance transceiver; frequency bands; 862 MHz to 928 MHz; 431 MHz to 464 MHz; data rates supported; 1 kbps to 300 kbps; 2.2 V to 3.6 V power supply; single-ended and differential PAs; low IF receiver with programmable IF bandwidths; 100 kHz, 150 kHz, 200 kHz, 300 kHz; receiver sensitivity (BER); −116 dBm at 1.0 kbps, 2 FSK, GFSK, −107.5 dBm at 38.4 kbps, 2 FSK, GFSK, −102.5 dBm at 150 kbps, GFSK, GMSK, −100 dBm at 300 kHz, GFSK, GMSK, −104 dBm at 19.2 kHz, OOK; very low power consumption; 12.8 mA in PHY_RX mode (maximum front-end gain); 24.1 mA in PHY_TX mode (10 dBm output, single-ended PA); 0.75 μA in PHY_SLEEP mode (32 kHz RC oscillator active); 1.26 μA in PHY_SLEEP mode (32 kHz XTAL oscillator active); 0.33 μA in PHY_SLEEP mode (deep sleep mode 1); RF output power of −20 dBm to +13.5 dBm (single-ended PA); RF output power of −20 dBm to +10 dBm (differential PA); patented fast settling automatic frequency control (AFC); digital received signal strength indication (RSSI); integrated PLL loop filter and Tx/Rx switch; fast automatic VCO calibration; automatic synthesizer bandwidth optimization</td>
<td>Low power; wideband; transceiver</td>
<td></td>
</tr>
<tr>
<td>ADF7030-1</td>
<td>High performance; narrow-band and wideband; transceiver</td>
<td>Frequency range (global ISM band); 2400 MHz to 2483.5 MHz; IEEE 802.15.4-2006-compatible (250 kbps); low power consumption; 19 mA (typical) in receive mode; 21.5 mA (typical) in transmit mode (PO = 3 dBm); 1.7 μA, 32 kHz crystal oscillator wake-up mode; high sensitivity; −95 dBm at 250 kbps; programmable output power; −20 dBm to +4.8 dBm in 2 dB steps; integrated voltage regulators; 1.8 V to 3.6 V input voltage range; excellent receiver sensitivity and blocking resilience; zero-IF architecture; complies with EN300 440 Class 2, EN300 328, FCC CFR47; part 15, ARIB STD-T66; digital RSSI measurement; fast automatic VCO calibration; automatic RF synthesizer bandwidth optimization</td>
<td>On-chip ARM Cortex-M0 processor that performs radio control and calibration, as well as packet management</td>
</tr>
<tr>
<td>ADF7241/ADF7242</td>
<td>ADF7241 is a highly integrated, low power, and high performance transceiver for operation in the global 2.4 GHz ISM band; it is designed with emphasis on flexibility, robustness, ease of use, and low current consumption; the IC supports the IEEE 802.15.4-2006 2.4 GHz PHY requirements in both packet and data streaming modes</td>
<td>Frequency range (global ISM band); 2400 MHz to 2483.5 MHz; IEEE 802.15.4-2006-compatible (250 kbps); low power consumption; 19 mA (typical) in receive mode; 21.5 mA (typical) in transmit mode (PO = 3 dBm); 1.7 μA, 32 kHz crystal oscillator wake-up mode; high sensitivity; −95 dBm at 250 kbps; programmable output power; −20 dBm to +4.8 dBm in 2 dB steps; integrated voltage regulators; 1.8 V to 3.6 V input voltage range; excellent receiver sensitivity and blocking resilience; zero-IF architecture; complies with EN300 440 Class 2, EN300 328, FCC CFR47; part 15, ARIB STD-T66; digital RSSI measurement; fast automatic VCO calibration; automatic RF synthesizer bandwidth optimization</td>
<td>IEEE802.15.4 and proprietary 2.4 GHz</td>
</tr>
<tr>
<td><strong>MEMS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADXL345</td>
<td>Low power, high speed CCD buffer amplifier</td>
<td>Very low buffer power consumption; as low as 20 mW on chip; power save feature to reduce active load current by GPO control; high buffer speed 400 MHz, −3 dB bandwidth; 415 V/μs slew rate; fast settling time to 1%, 2 V step: 5 ns</td>
<td>Low power, high accuracy</td>
</tr>
</tbody>
</table>