AI-in-Sensor Imager with Low Power Bluetooth/Wi-Fi, ARM Cortex M3, Crypto Engine, Power Management and More

General description

MantisConnect is an "always on," AI-in-Imager solution for IoT applications in busy areas where IR triggered cameras have a short battery life, or where IR beam sensors or ultrasound detectors have traditionally been used. MantisConnect is designed to minimize development time, area and power for rapid real-world deployment. MantisConnect includes a CIS imager, inference AI engine, AEC (automatic exposure control), power management (including on board DC/DC), timing control, an ARM Cortex M3 microcontroller, ultra-low power Bluetooth & Wi-Fi, a crypto engine, 8 Mbits of Flash memory, real time clock, and decoupling capacitor. The only external parts required are a lens, crystal oscillators and antenna components.

MantisConnect is a "code zero" device offering AI network building blocks which may be combined to build arbitrary AI solutions. A number of pre-existing AI solutions may be downloaded from the AIStorm website for rapid deployment.

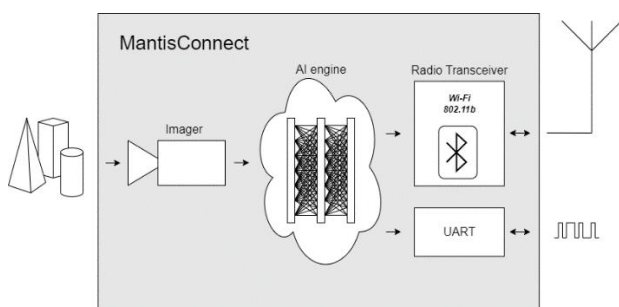MantisConnect is available in a 66 pin OLGA package.

Figures

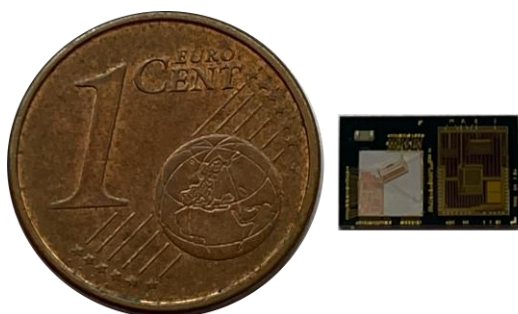**Figure 1 – MantisConnect Concept**

Figure 2 – Relative Size of MantisConnect

Features

- **Complete AI-in-Sensor Single Part Solution:**

  - 96x96 CMOS Image Sensor Array
  - Inference AI Engine
  - ARM Cortex M3 with 8Mbits Flash
  - Wireless Radio Transceiver
  - AEC (automatic exposure control)
  - Power Management
  - Low-power Always-On Operation (~1mA)

- **Ultra Low Power Wi-Fi**

  - 802.11b up to 11Mb
  - Supports STA Mode
  - WPA/WPA2 security supported
  - Automatic beacon scanning and discover
  - Built in TCP/IP Stack
  - Integrated Dual PAs (-2dBm and +10dBm)

- **Bluetooth Smart**

  - Compliant with BLE 5.0 BLE up to 2Mbps
  - Slave Mode Support
  - All GATT-based Profiles Supported
  - Built in BLE Stack
  - 0 to 10dBm Output Power
  - -93dBm Receive Sensitivity

- **HW Crypto Engine**

  - AES128/256 Operation
  - P-192/256 ECDH (Elliptic Curve Diffie-Hellman) Key Generation

- **Integrated power management including DC/DC**

- **Real time clock, UART, OTA, Firmware Update, SPI**

- **8.6x5x1.1mm, 66 pad, optical land grid array (OLGA)**

Applications

- Face classification/detection
- IR & Ultrasound Sensor Replacement
- Smart Occupancy Sensors for Home and Business Automation
- People counting (virtual barrier)
- Gesture identification
- Person Detection
- Smart Locks, Smart Lighting
- Smart Parking
- Retail Analytics and Theft Prevention
- Smart Coffee Makers
- Camera to Camera Person Tracking
- Proximity Detection