**S O C**
R O B O T I C S

Overview

PaellaM is a smart IO expansion board that attaches to the Raspberry PI's IO expansion connector. PaellaM uses an STM32F042, STM32F072 or STM32F303 processor running at 48MHz or 72MHz that brings high speed A/D, D/A and digital IO to the PI.   PaellaM is available with or without a 9DOF sensor (MPU-9150) installed.

Features:

- Fast 48MHz 32bit STM32F042, STM32F072 or 72MHz STM32F303 processor
- STM32F303 has hardware floating point co-processor
- 12bit DAC running at 1Msps
- 12bit A/D running at 1Msps, 303 4Msps
- Two USARTS (one connected to PI)
- SPI interface to PI and RF24L01
- On chip DFU boot loader for software field upgrades via USB port
- I2C OLED display interface for direct connect
- Digital IO and Analog brought to connectors
- Direct Raspberry PI interface
- Real time data acquisition application providing analog input, DAC output and digital IO
- Optional MPU-9150 9DOF sensor pad
- Open source application software available

The PI communicates with PaellaM using either a serial USART, I2C or high speed SPI connection. The STM32Fxxx can be instructed by the user to execute complicated real time data acquisition/monitoring functions without PI intervention. A data acquisition application written using CooCox IDE is available.
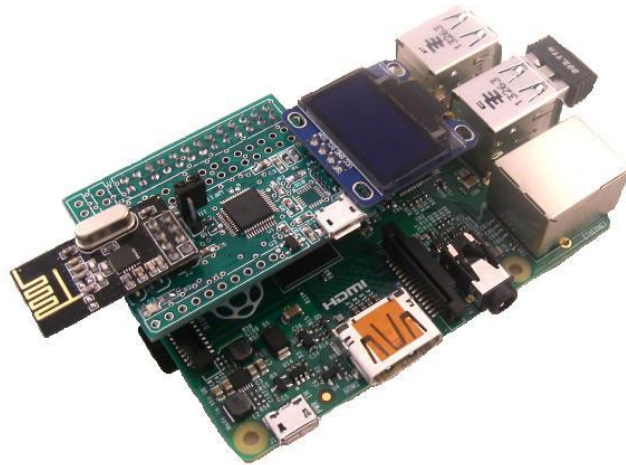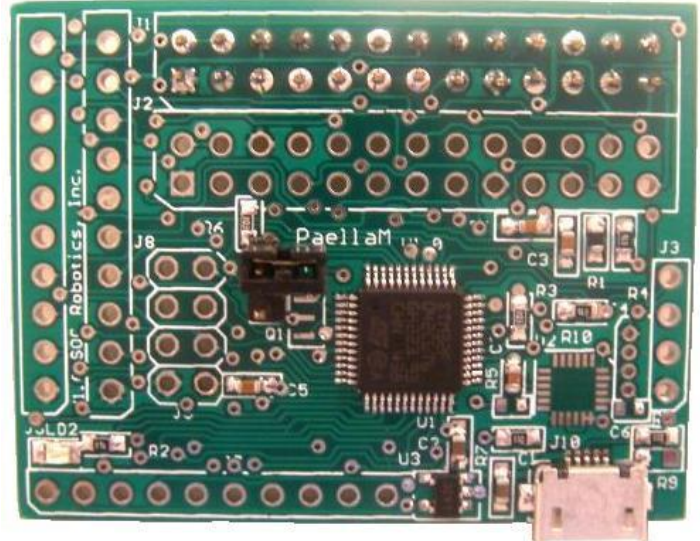
OLED Display Connector

PaellaM has a connector that supports direct connection of a low cost OLED 128x64 display module on the I2C expansion port. The STM32Fxxx or PI processor can control the I2C connection.

RF24L01 Wireless Connector

PaellaM has a connector that supports direct connection of a low cost RF2401 wireless communication module allowing the PI to operate as a wireless base station for low cost wireless data acquisition modules.

MPU-9150 9DOF Inertial Sensor

An optional 9 Degree of Freedom Inertial sensor can be mounted. A MARG integration filter (Madgwick) is included that converts raw sensor data into roll, pitch and

PaellaM Connector Pin Assignments

PaellaM has a number of interface options. The STM32Fxxx provides analog input, analog output, digital IO, SPI, USART and I2C interfaces. A dedicated connector, compatible with the popular RF24L01 wireless communication module, is available for direct connection. An optional 9 DOF inertial sensor (MPU-9150) is available as well. PaellaM attaches to the Raspberry PI's P1 connector. The P1 connector is duplicated on the PaellaM PCB so other devices can be connected to the PI. The PI communicates with the STM32Fxxx via the USART, I2C or SPI port. The SPI port is capable of extremely high speed bidirectional data flow. A complete pin assignment is provided below. A data acquisition and RF communication application runs on the STM32Fxxx controlling the RF24L01 wireless subsystem and the MPU-9150 9 DOF sensor. Either the PI processor or STM32Fxxx processor can communicate with the RF24L01, OLED display or MPU-9150. Default communication link between the PI and STM32 is the USART (TXD, RXD). PaellaM can be powered directly from the USB port and run as a standalone board. PaellaM is compatible with PI B, B+ and PI 2.

PaellaM Connector Pin Assignment
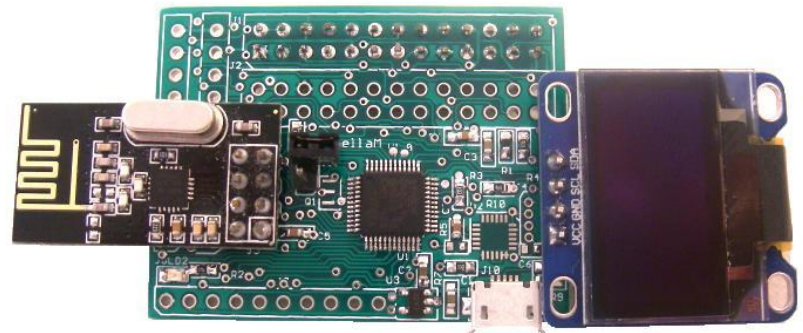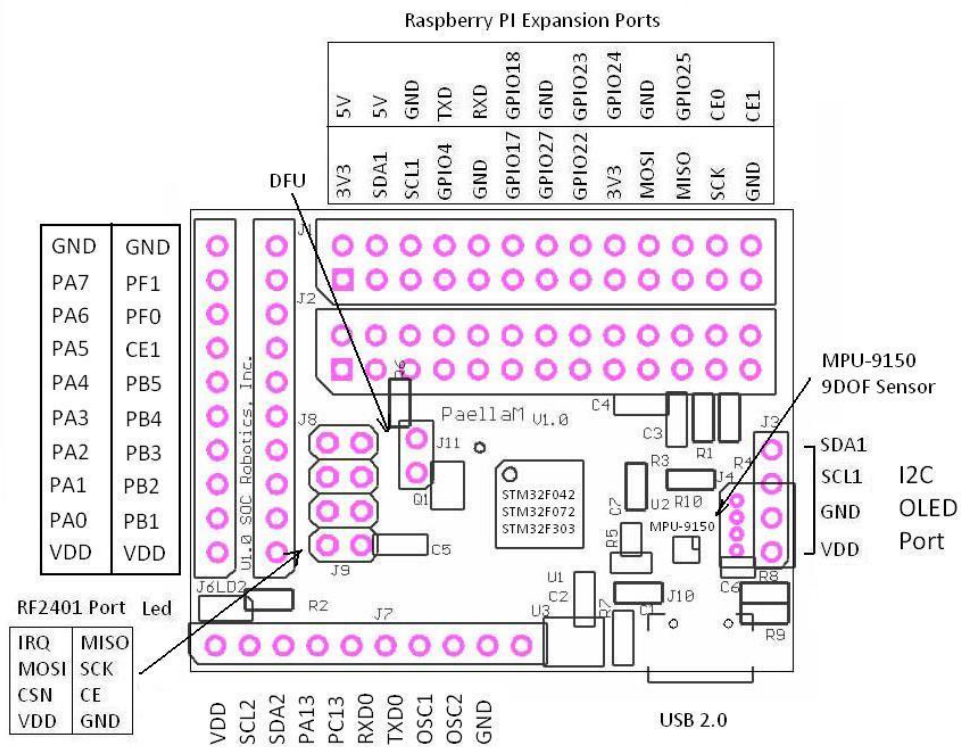
Paella YouTube video is here.

For more Technical Information and
pricing contact sales@soc-robotics.com.