

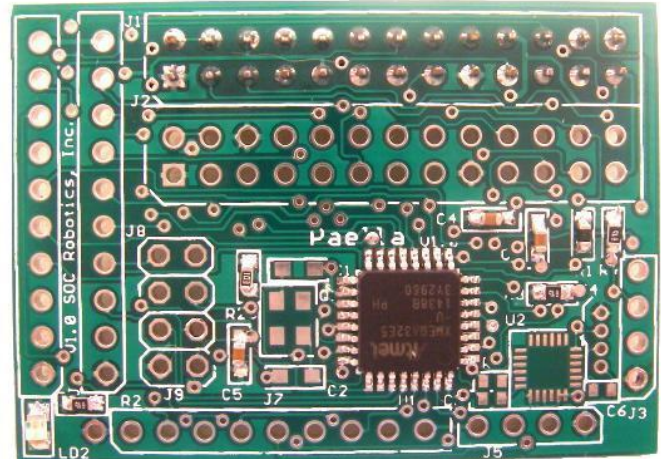
**Overview**

Paella is a smart IO expansion board that attaches to the Raspberry PI’s IO expansion connector. Paella has an ATxmega32E5 processor running at 32MHz that brings high speed A/D, D/A and digital IO to the PI. Paella is available with or without a 9DOF sensor (MPU-9150) installed.

**Features:**

- Fast 32MHz 8bit ATxmega32E5 AVR processor
- 12bit DAC running at 1Msps
- 12-16bit A/D running at 300Ksps
- Two USARTS (one connected to PI)
- SPI interface to PI and RF24L01
- On chip DFU boot loader for software field upgrades
- I2C OLED 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
- PI expansion connector duplicated

The PI communicates with Paella using either a serial USART, I2C or high speed SPI connection. The ATxmega32E5 can be instructed by the user to execute complicated real time data acquisition/monitoring functions without PI intervention. A data acquisition application written using AVR Studio 6.2 is available.



**OLED Display Connector**

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



**RF24L01 Wireless Connector**

Paella 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.



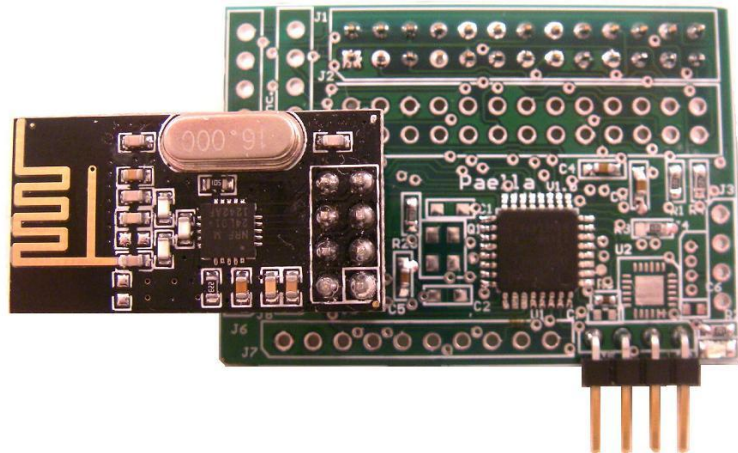
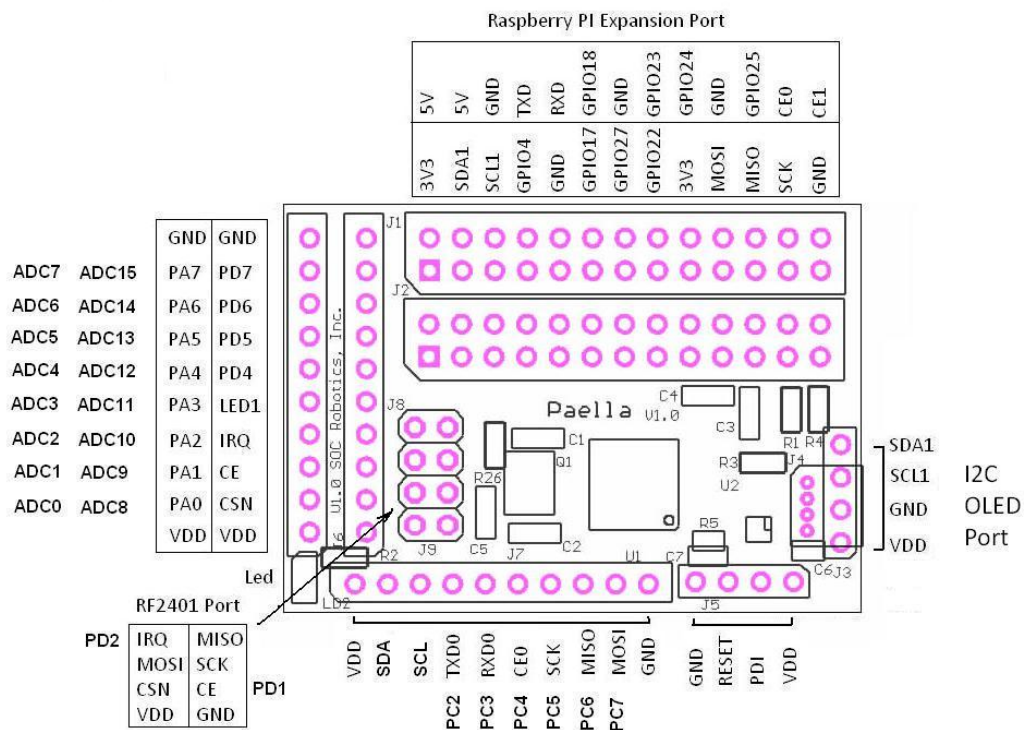
**MPU-9150 9DOF Inertial Sensor**

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 yaw in real time (166Hz).

### Paella Connector Pin Assignments

Paella has a number of interface options. The ATxmega32E5 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. Paella attaches to the Raspberry PI's P1 connector. The P1 connector is duplicated on the Paella expansion module so other devices can be connected to the PI. The PI communicates with the ATxmega32E5 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 ATxmega32E5 controlling the RF24L01 wireless subsystem and the MPU-9150 9 DOF sensor. Either the Pi processor or ATxmega processor can communicate with the RF24L01, OLED display or MPU-9150.

PAELLA Connector Pin Assignment



Paella YouTube video is [here](#).

For more Technical Information and pricing contact [sales@soc-robotics.com](mailto:sales@soc-robotics.com).