E3K WallySci Bio-Sensing Platform

E3K-COMBO

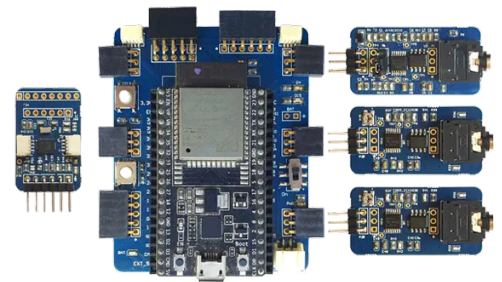## Product Overview

01-13-2023

For the most up-to-date information, visit www.mouser.com or the supplier's website.

Description

Crowd Supply WallySci E3K Bio-Sensing Platform provides an affordable, fully open-source, wireless framework for an intuitive understanding of bio-signals originated from the human heart, muscle, and brain. This platform features various modules, including Wi-Fi and BLE-enabled Data Communication and Processing Unit (DCPU), Electromyography (EMG) sensor, Electrocardiography (ECG) sensor, and Electroencephalography (EEG) sensor. This bio-sensing platform also includes a 9-DoF Inertial Measurement Unit (IMU) to capture motion. Combined with the firmware and data collection software, these modules enable a reliable and high data acquisition rate. The WallySci E3K bio-sensing platform GUI allows configuring each channel and collecting data without requiring coding. The modularity feature of the platform allows the E3K to be configured into a bio-signal acquisition tool.
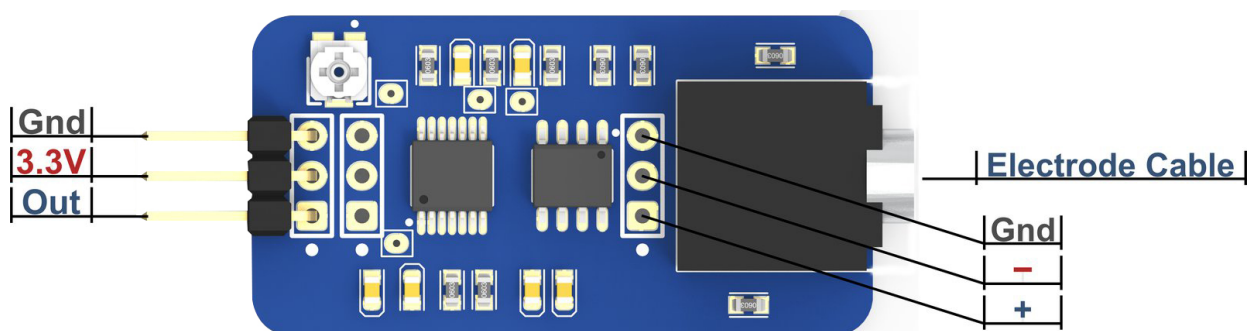
The WallySci E3K bio-sensing platform supports widely used communication protocols like UART, I²C, and SPI and provides ten GPIO pins, six analog pins, and two DACs. All the ports are based on Commercial Off-The-Shelf (COTS) connectors pre-soldered on the boards. This platform is ideal for developing healthcare or wearable device.
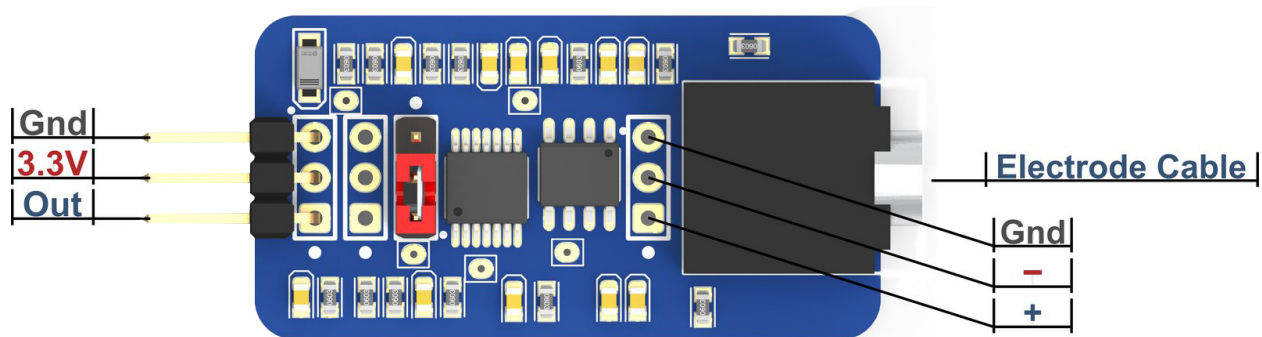
Features

- Modules:
    - Wi-Fi and BLE enabled Data Communication and Processing Unit (DCPU)
    - Electromyography (EMG) sensor to capture muscle movements
    - Electrocardiography (ECG) sensor to capture heart signals
    - Electroencephalography (EEG) sensor to capture brain activity
    - 9-DoF Inertial Measurement Unit (IMU) to capture motion
- Interactive Graphical User Interface (GUI)
- Communication protocols supported:
    - UART, I²C, and SPI
    - 10x GPIO pins
    - 6x analog pins
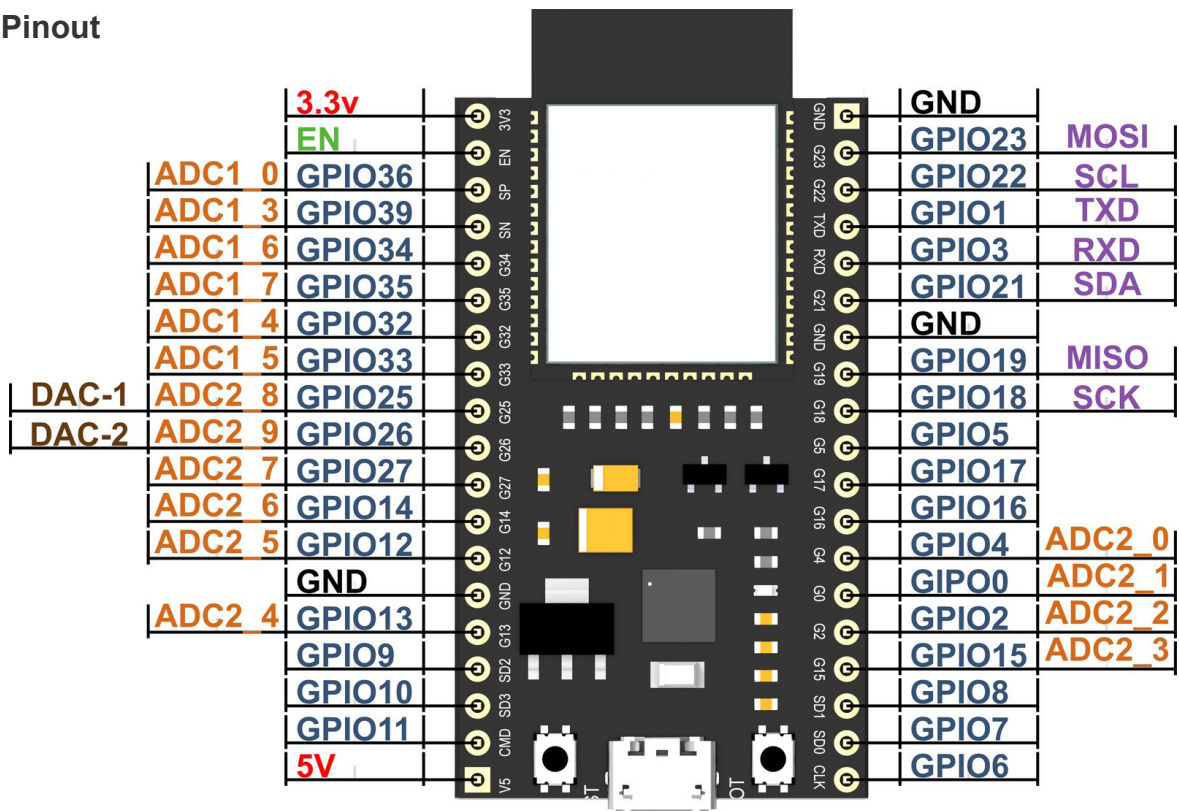   - 2x DACs
- Impressive Signal-to-Noise Ratio (SNR)

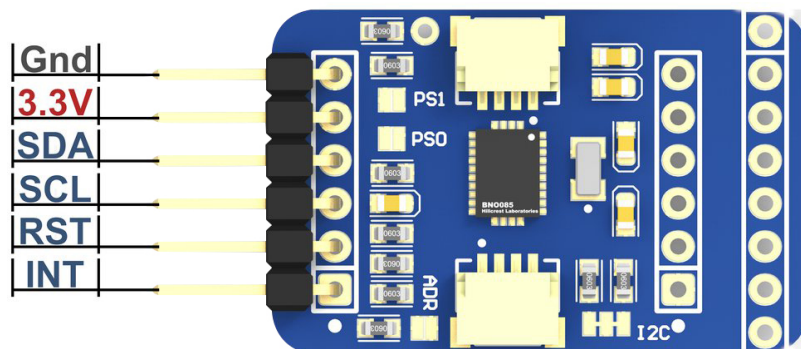# Pinout Diagrams

DCPU Pinout

ECG & EEG Biosensor Pinout

EMG Biosensor Pinout

| Gnd |
| 3.3V |
| Out |

| Electrode Cable |
| Gnd |
| − |
| + |

ESP32 Pinout

	3.3v	3V3		GND	**GND**	
	EN	EN		G23	GPIO23	**MOSI**
ADC1_0	GPIO36	SP		G22	GPIO22	**SCL**
ADC1_3	GPIO39	SN		TXD	GPIO1	**TXD**
ADC1_6	GPIO34	G34		RXD	GPIO3	**RXD**
ADC1_7	GPIO35	G35		G21	GPIO21	**SDA**
ADC1_4	GPIO32	G32		GND	**GND**	
ADC1_5	GPIO33	G33		G19	GPIO19	**MISO**
DAC-1 **ADC2_8**	GPIO25	G25		G18	GPIO18	**SCK**
DAC-2 **ADC2_9**	GPIO26	G26		G5	GPIO5	
ADC2_7	GPIO27	G27		G17	GPIO17	
ADC2_6	GPIO14	G14		G16	GPIO16	
ADC2_5	GPIO12	G12		G4	GPIO4	**ADC2_0**
	GND	GND		G0	GIPO0	**ADC2_1**
ADC2_4	GPIO13	G13		G2	GPIO2	**ADC2_2**
	GPIO9	SD2		G15	GPIO15	**ADC2_3**
	GPIO10	SD3		SD1	GPIO8	
	GPIO11	CMD		SD0	GPIO7	
	5V	V5		CLK	GPIO6	

IMU Pinout

| Gnd |
| 3.3V |
| SDA |
| SCL |
| RST |
| INT |

Mouser Part Number

View Part

To learn more, visit

https://www.mouser.com/new/crowd-supply/crowd-supply-wallysci-e3k-biosensing-platform/