Raspberry Pi 3

ESP32 Co-Processor

Image Capture

UART RX

ESP32 GPIO
16 (RX)
ESP32 GPIO
17 (TX)

Image Processing

Parse Command

Classification

Calculate Timing

Generate Command

Motor Control

UART TX

Trigger Ejectors

Pi GPIO 14 (TX)
Pi GPIO 15 (RX)

UART TX (ACK)

UART Connection Details:

Baud Rate: 115,200 bps
Format: 8 data bits, no parity, 1 stop bit (8N1)
Logic Level: 3.3V (no level shifting required)

Data Flow:
Raspberry Pi → ESP32: Motor/Ejector Commands
ESP32 → Raspberry Pi: Acknowledgment/Status