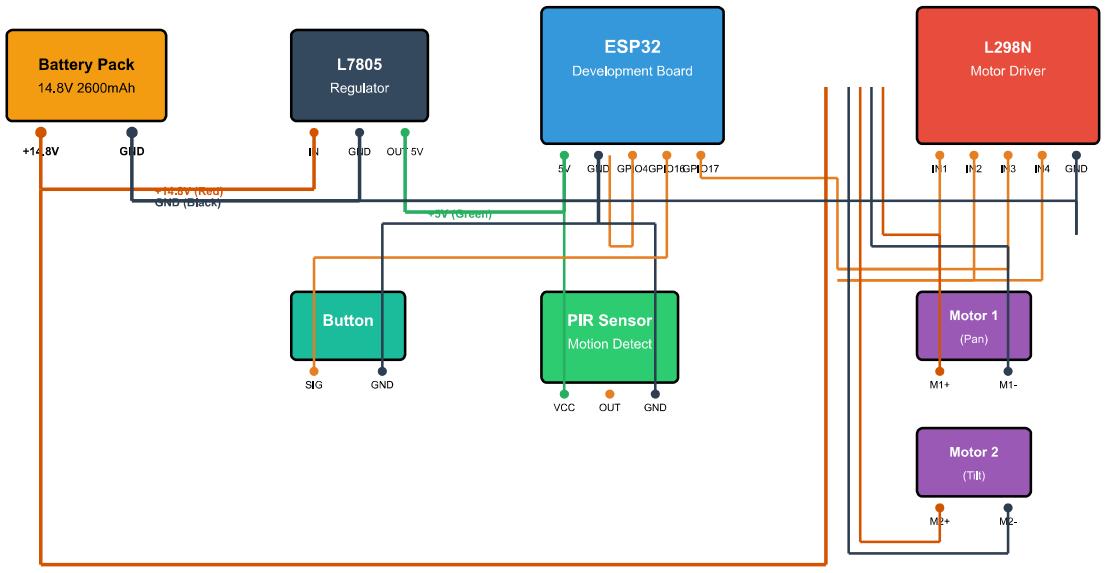
SMART SURVEILLANCE TURRET

Wiring Diagram & Connection Guide



FROM COMPONENT	PIN/TERMINAL	TO COMPONENT	PIN/TERMINAL	WIRE COLOR	PURPOSE
Battery Pack	+ (Positive)	L7805 Regulator	INPUT	Red	Main Power Supply (14.8V)
Battery Pack	- (Negative/GND)	L7805 Regulator	GND	Black	Ground Connection
L7805	OUTPUT (5V)	ESP32	5V / VIN	Green	Regulated 5V Power
L7805	GND	ESP32	GND	Black	Common Ground
ESP32	5V	PIR Sensor	VCC	Red	Power to PIR Sensor

FROM COMPONENT	PIN/TERMINAL	TO COMPONENT	PIN/TERMINAL	WIRE COLOR	PURPOSE
ESP32	GPIO 4	PIR Sensor	OUT	Yellow	Motion Detection Signal
ESP32	GND	PIR Sensor	GND	Black	Ground Connection
ESP32	GPIO 16	Push Button	Signal Pin	Blue	Manual Control Input
Push Button	Other Pin	ESP32	GND	Black	Ground Connection
ESP32	GPIO 17	L298N	IN1	Orange	Motor 1 Direction A
ESP32	GPIO 18	L298N	IN2	Orange	Motor 1 Direction B
ESP32	GPIO 19	L298N	IN3	Orange	Motor 2 Direction A
ESP32	GPIO 21	L298N	IN4	Orange	Motor 2 Direction B
Battery Pack	+ (14.8V)	L298N	12V Input	Red (Thick)	Motor Power Supply
Battery Pack	- (GND)	L298N	GND	Black (Thick)	Power Ground
L298N	OUT1	Motor 1	Terminal 1	Red	Motor 1 Power (+)
L298N	OUT2	Motor 1	Terminal 2	Black	Motor 1 Power (-)
L298N	OUT3	Motor 2	Terminal 1	Red	Motor 2 Power (+)
L298N	OUT4	Motor 2	Terminal 2	Black	Motor 2 Power (-)

⚡ Power Distribution

Primary Power: 14.8V Lithium-Ion Battery Pack (2600mAh)

- **L7805 Voltage Regulator:** Converts 14.8V → 5V for ESP32, PIR sensor, and other logic components
- **L298N Motor Driver:** Receives direct 14.8V from battery for motor power
- **Total Current Draw:** ~2-3A (peak during motor operation)
- **Estimated Runtime:** 30-60 minutes depending on motor usage

⚠ Important Notes & Safety Instructions

- **Wire Gauge:** Use 22-24 AWG for signal wires, 18-20 AWG for motor power wires
- **Heat Sinks:** Ensure L7805 and L298N have proper heat sinks attached as they will generate heat
- **Polarity:** Double-check battery polarity before connecting - reversed polarity can damage components
- **Jumper Settings:** Remove the 5V jumper on L298N if you're providing external motor power (14.8V)
- **Capacitors:** Add 100µF capacitors across L7805 input/output and motor terminals to reduce noise
- **GPIO Configuration:** Enable internal pull-up resistor for button (pinMode(16, INPUT_PULLUP))
- **PWM Signals:** Use PWM on IN1-IN4 pins for speed control (0-255 value range)
- **Testing:** Test each connection with a multimeter before powering on the complete system
- **Fusing:** Consider adding a 3A fuse on the battery positive terminal for safety
- **Wiring Order:** Connect all signal wires first, then ground wires, and power wires last