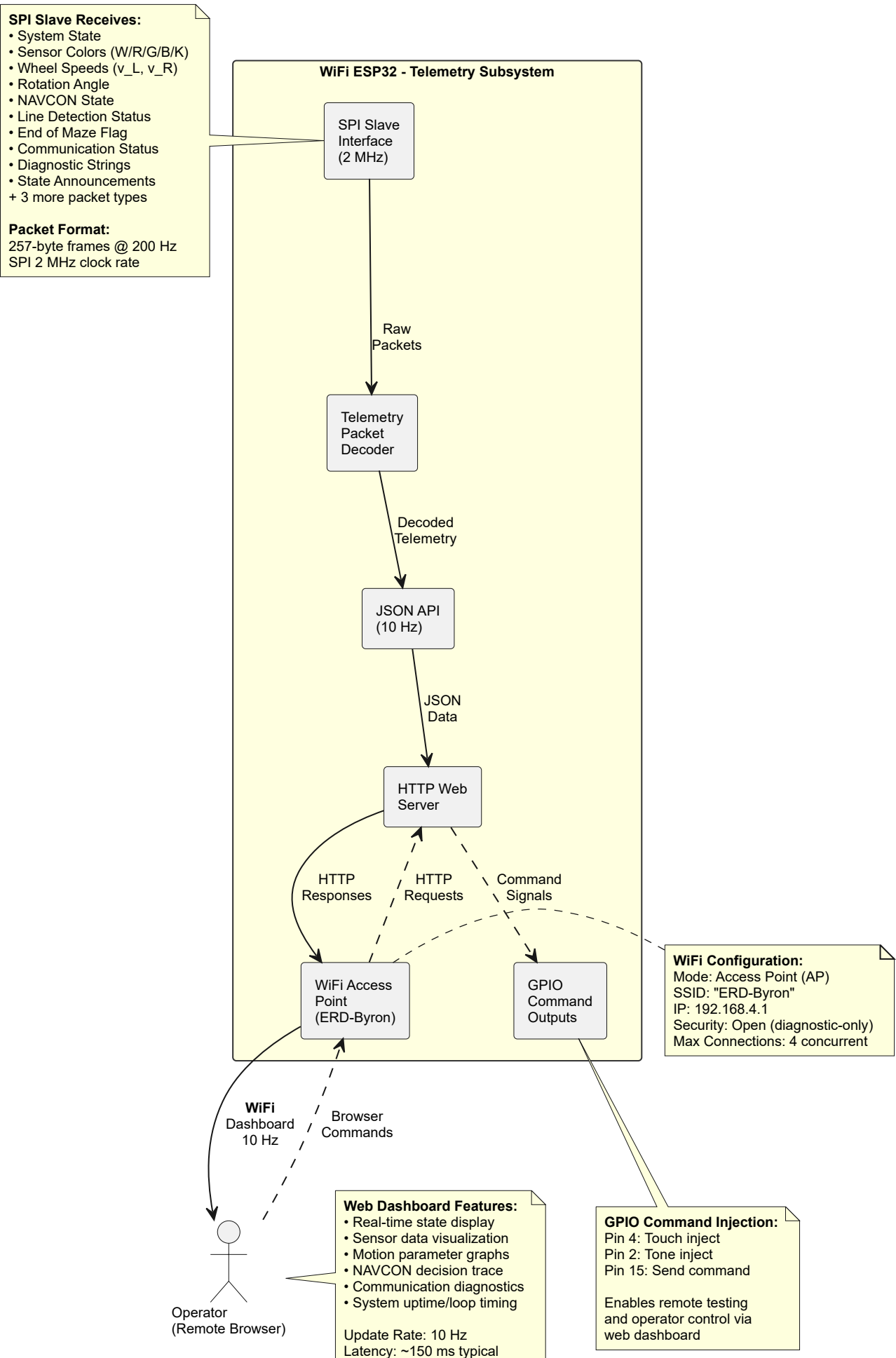
SPI Slave Receives:
• System State
• Sensor Colors (W/R/G/B/K)
• Wheel Speeds (v_L, v_R)
• Rotation Angle
• NAVCON State
• Line Detection Status
• End of Maze Flag
• Communication Status
• Diagnostic Strings
• State Announcements
+ 3 more packet types
Packet Format:
257-byte frames @ 200 Hz
SPI 2 MHz clock rate
WiFi ESP32 - Telemetry Subsystem
SPI Slave Interface (2 MHz)
Raw Packets
Telemetry Packet Decoder
Decoded Telemetry
JSON API (10 Hz)
JSON Data
HTTP Web Server
HTTP Responses
HTTP Requests
Command Signals
WiFi Access Point (ERD-Byron)
GPIO Command Outputs
WiFi Configuration:
Mode: Access Point (AP)
SSID: "ERD-Byron"
IP: 192.168.4.1
Security: Open (diagnostic-only)
Max Connections: 4 concurrent
WiFi
Dashboard 10 Hz
Browser Commands
Operator (Remote Browser)
Web Dashboard Features:
• Real-time state display
• Sensor data visualization
• Motion parameter graphs
• NAVCON decision trace
• Communication diagnostics
• System uptime/loop timing
Update Rate: 10 Hz
Latency: ~150 ms typical
GPIO Command Injection:
Pin 4: Touch inject
Pin 2: Tone inject
Pin 15: Send command
Enables remote testing and operator control via web dashboard