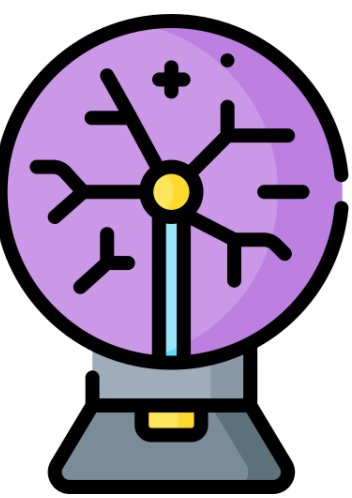


# Lab smarter with task-centric Multimodal neuro-physical recording tools: A Demo

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## PLASMA: LSL-backed Multimodal neuro-physical instrumentation

- Cognitive science research is moving from *unimodal* to *multi-modal*
- Current state of practice:
  - one sensor + one app: labor intensive, prone to operator error
  - lab streaming layer (LSL) to timestamp measurements for post-processing

### What is *task-centric* for multimodal neuro-physical recording?

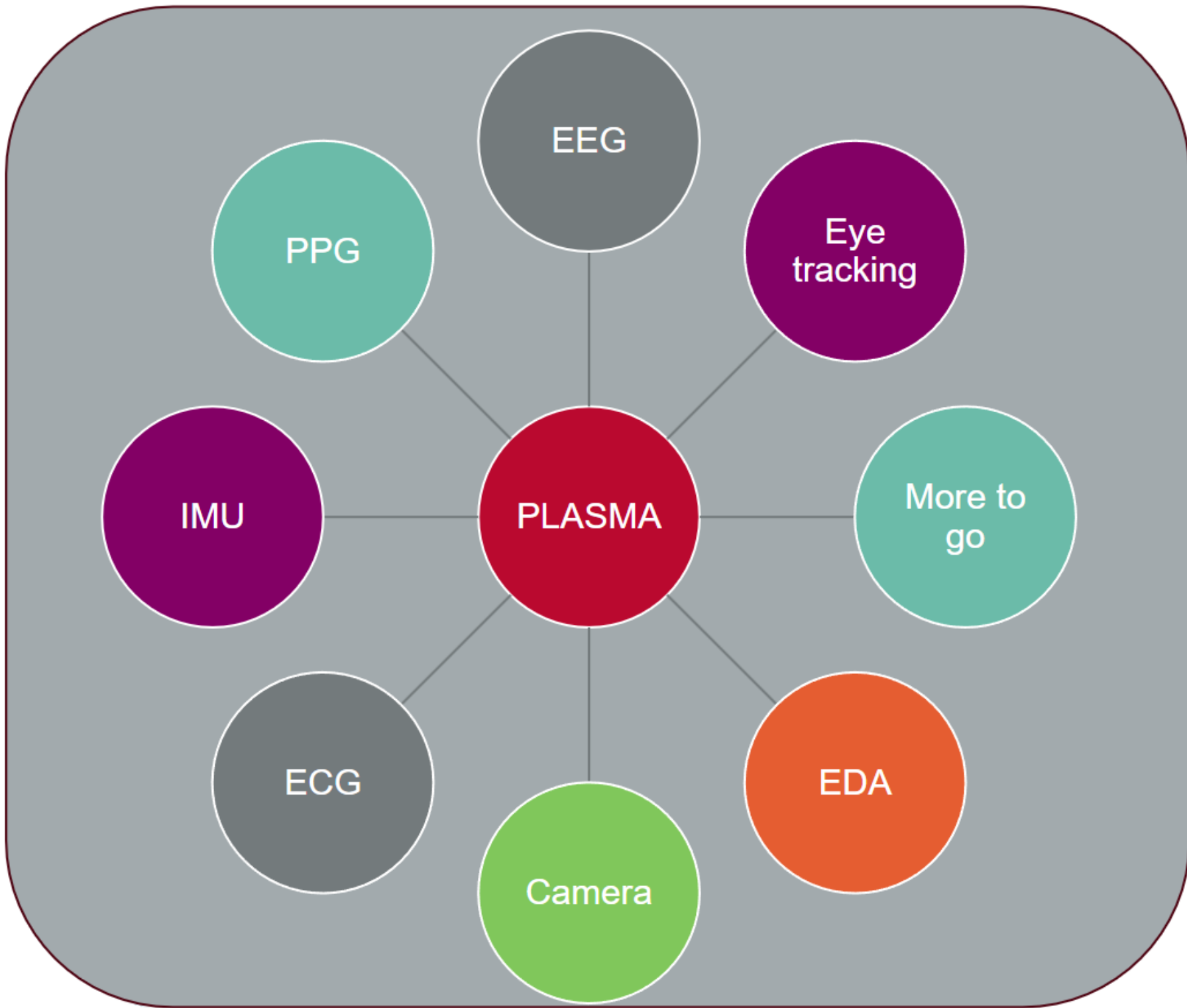
Inspiration from aviation: centralized display for critical system and status



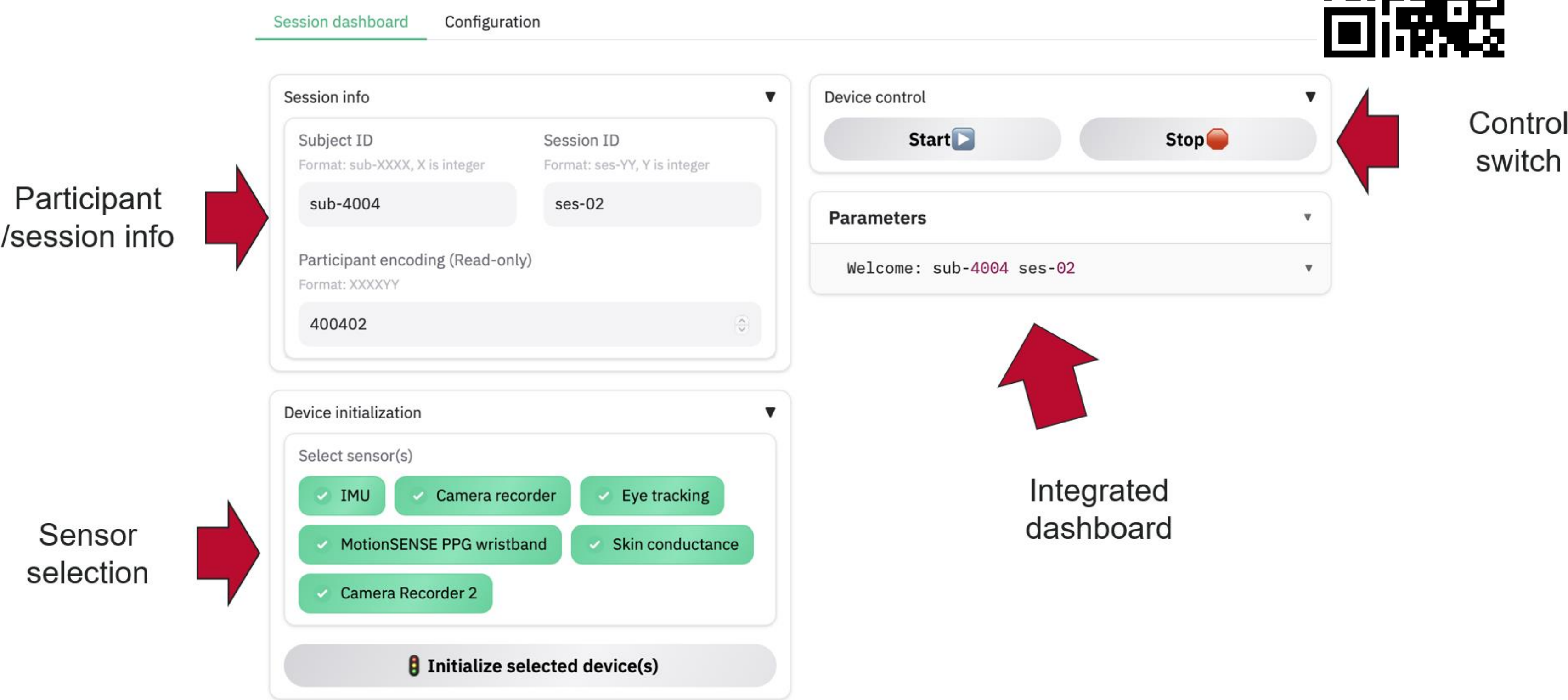
We want a smart lab experience:

- Unified control: “One app to control them all!”
- Human-centered design: task-aware monitoring

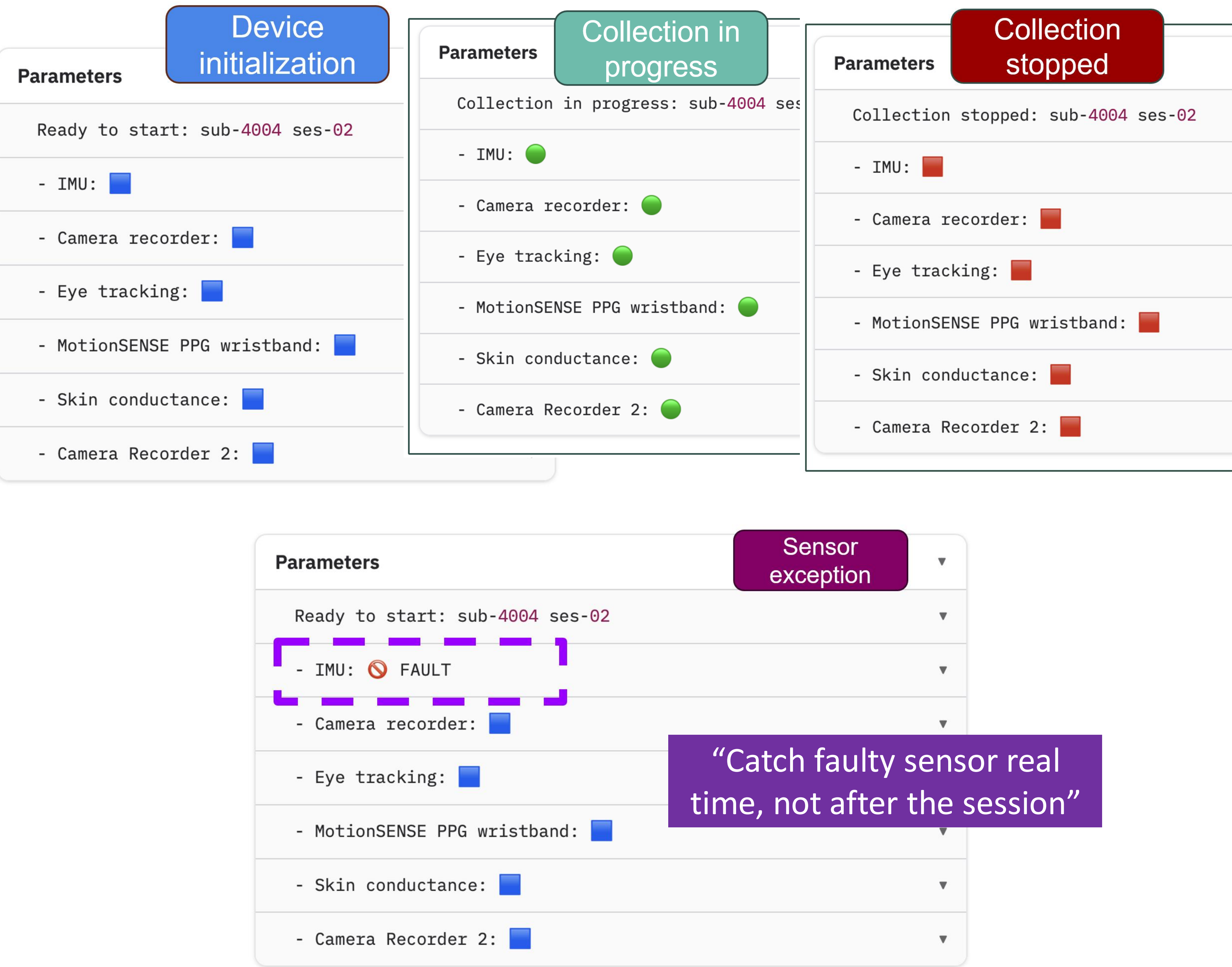
### Unified multimodal sensor synchronization



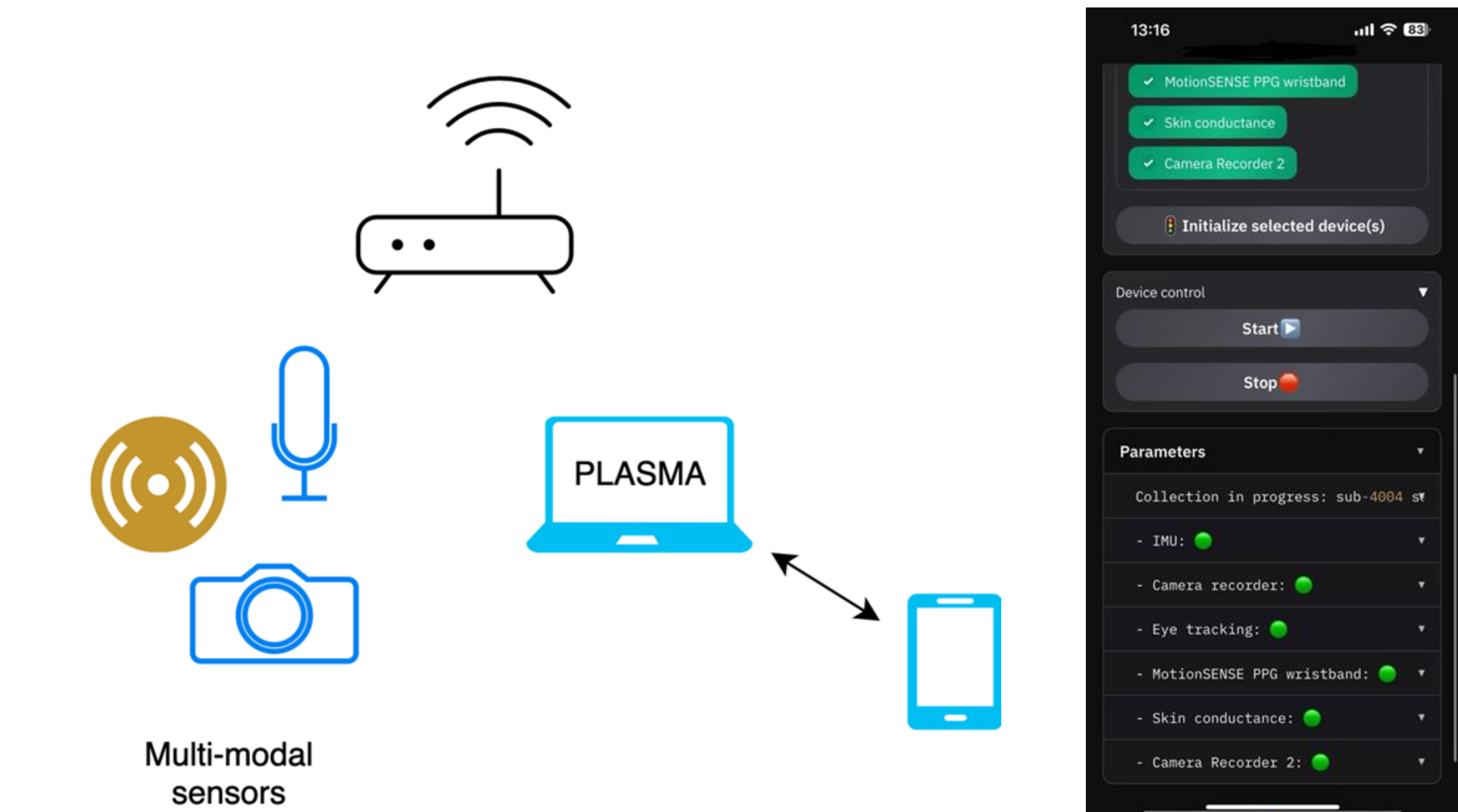
### Integrated dashboard with real time visualization



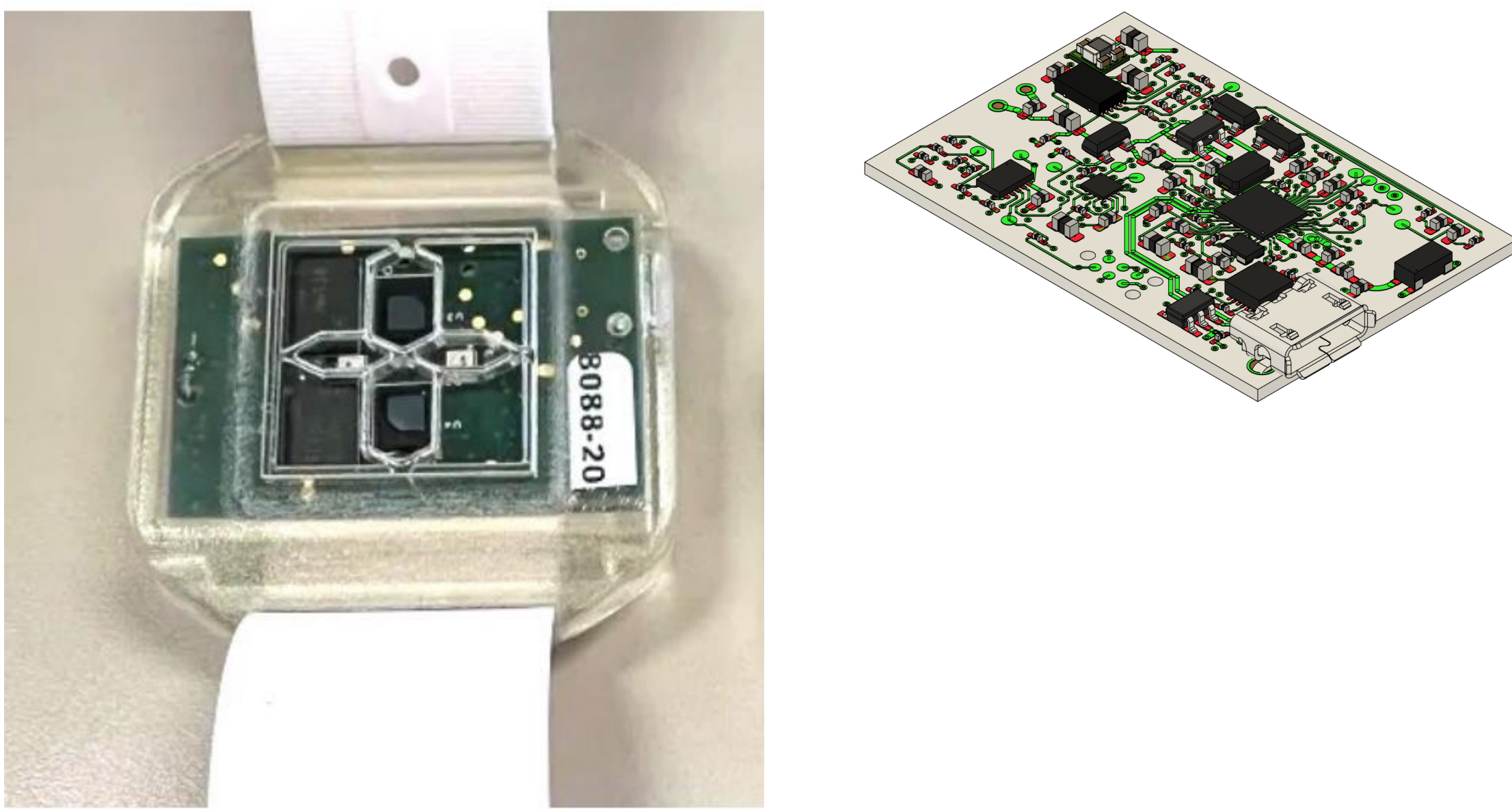
### Session-sensor lifecycle management



### Web-based UI allowing remote instrumentation



### MotionSenSE HRV v4: Open research wristband for HRV and motion



- MotionSENSE v4: our next generation nRF-53 based wristband
  - Green and IR PPG
  - 9-Axis MEMS IMU
  - 2GB/4GB NAND Flash for up to 30-day of recordings
  - Custom FTL powered FAT-FS 8 gigabit file system
  - USB mass storage support
  - Real-time Zephyr OS
  - Smaller physical footprint vs previous gen
- Sensing features
  - Real-time IMU and PPG measurements with internal RAW data backup
  - LabStreamingLayer (LSL) integration
  - Time-stamped ENMO calculation