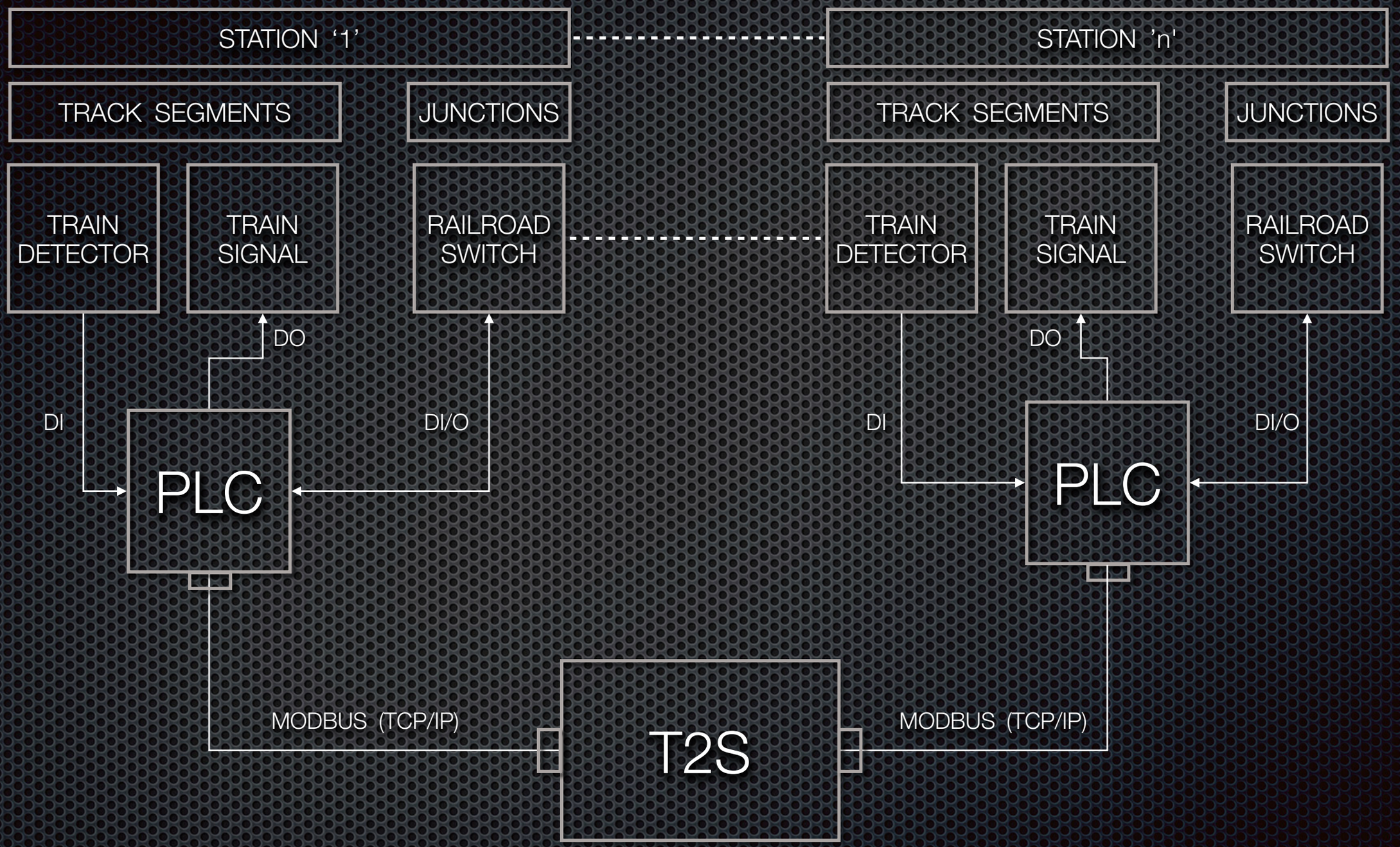
Train Traffic & Signalling System

Case Study

System Architecture Diagram



Design Choices

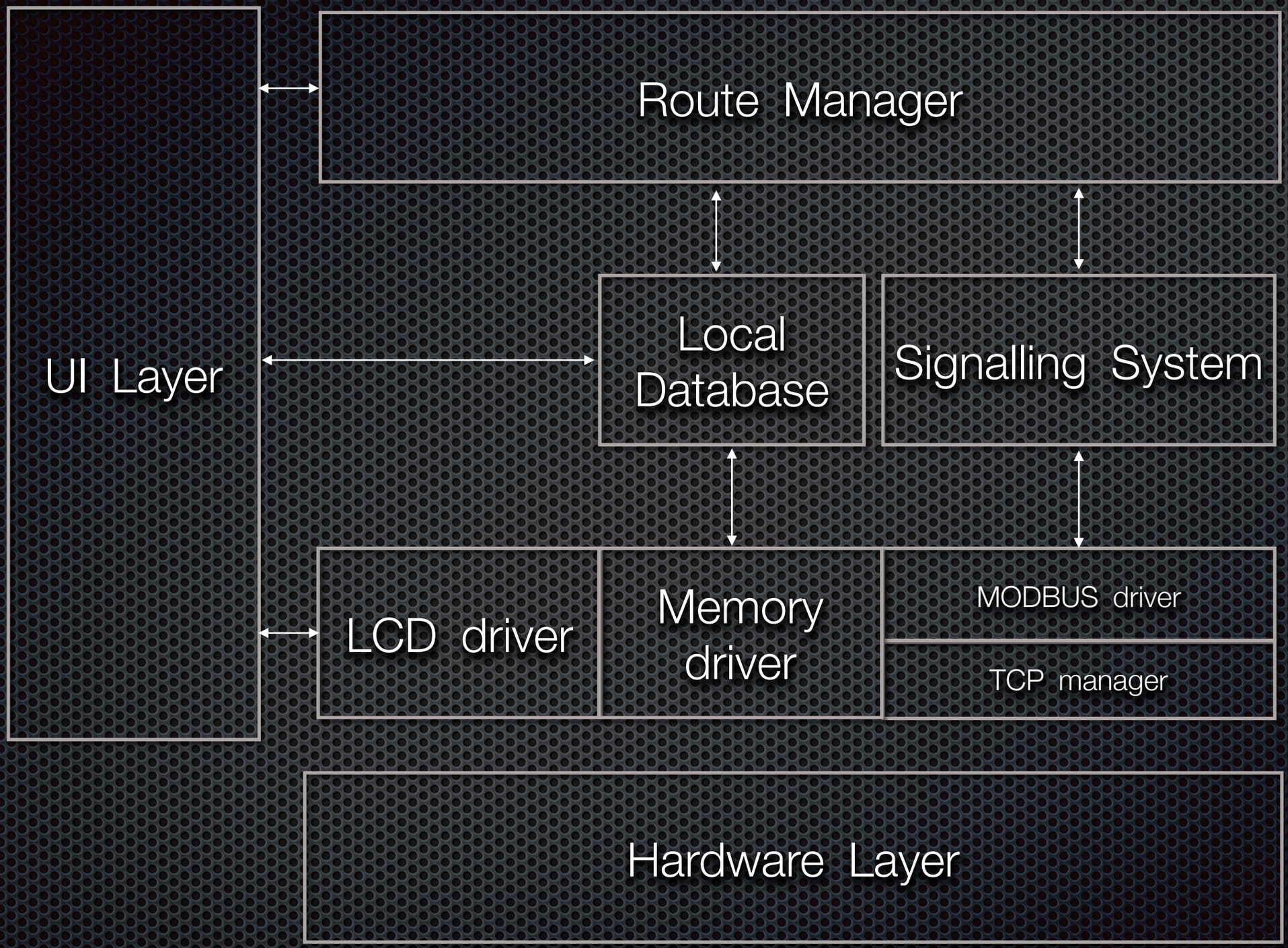
Hardware

- Track circuit, Track signal, Railroad Switch (Turnout)
- Programmable Logic controller
- Micro-controller: 64-bit, ethernet interface (MODBUS over TCP/IP), HMI, memory interface

Software

- Hard Real Time environment
- RTOS - Priority based scheduling, pre-emptive kernel, bounded & low interrupt latency
- Modbus Driver + TCP/IP stack (ThreadX-NetX)
- HMI: LCD controller
- Object Oriented Programming - C++

Software Architecture



Risks & Limitations

- Difficult to map data points for huge networks
- No co-ordination between multiple T2S units
- Doesn't support direct communication with Train