MOCKUP DESIGN ARCHITECTURE

Open Industrial Plant Complex

Wireless Sensor Module 1

Wireless Sensor Module 2

Wireless Sensor Module 3

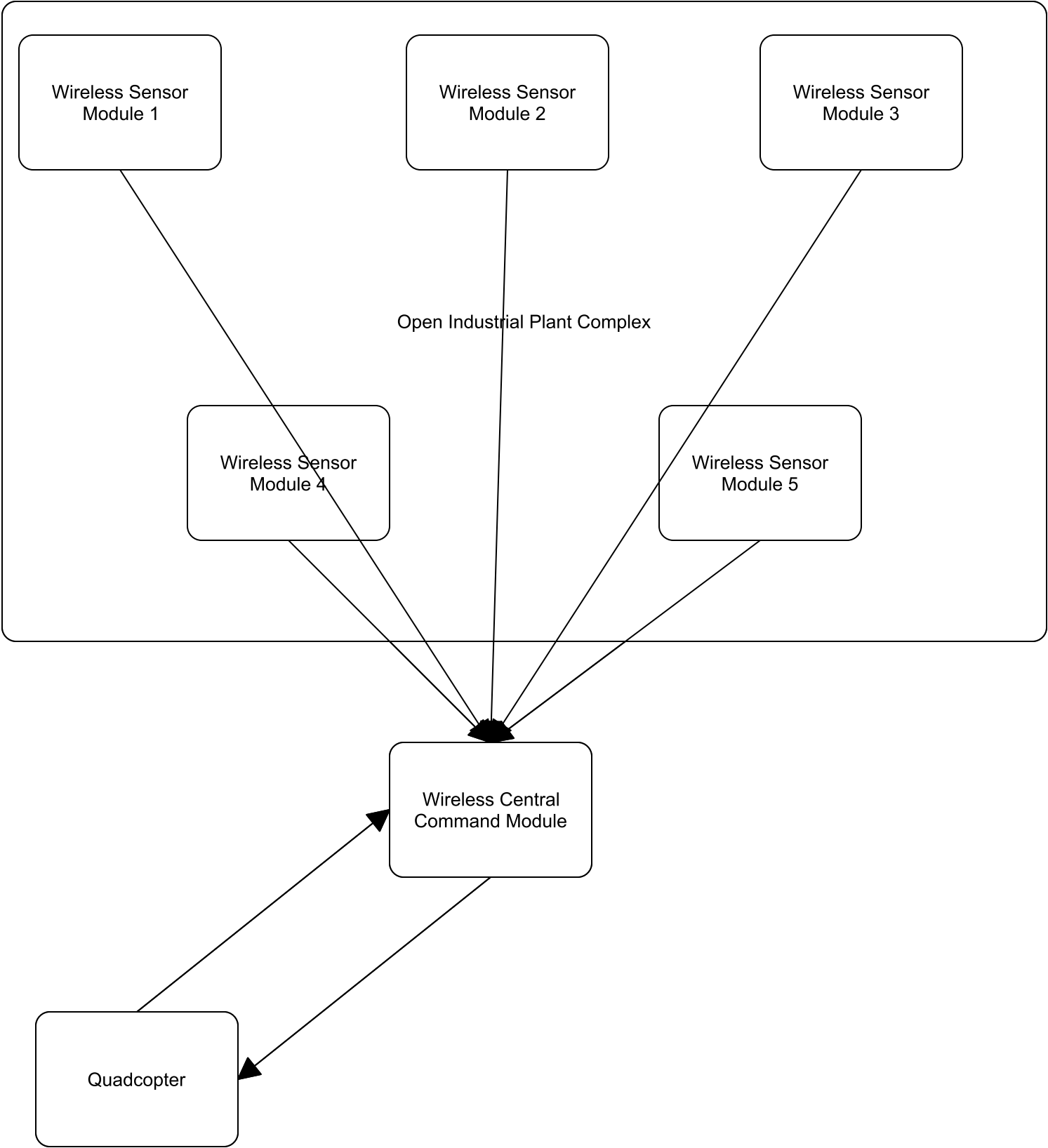Wireless Sensor Module 4

Wireless Sensor Module 5

Wireless Central Command Module

Quadcopter

Techologies To Be Employed:

Wireless Networking/Wireless Communication 802.11 (Point to Multipoint Topology): This communication is used between the Wirelesss Central Command Module and the Sensor Modules, the central command module serving as a Central AP(Access Point) and the sensor modules as clients, this communication is done wirelessly over the Wifi(802.11) wireless standard, data from each sensor module is sent to the central Command Module over this communication protocol for processing.

Embedded Systems/Linux (Raspberry Pi/ARM Cortex M4): This is the central command module that recieves sensory data from each sensor module using its on board Wireless NIC (Network Interface Card) serving as an AP, receiving data from each sensor module and processes it, based on the logic defined in the software running on the system, it commands the Quadcopter appropraitely, it has an onboard telemetry/command module with which it sends MAVlink commands to the on board computer on the Aerial vehicle, which also possesses the same telemtry/command unit, for recieving commands from the central Module. It serves as the central control in this system.

Drone (UAV/Quadcopter): This is the Aerial Vehicle which is the actuation point it in this system, it has an on board computer that controls the dynamics of the vehicle at a lower level, from higher level commands recieved from the Central Control Module over MAVlink communication protocol.

MAVLink: The Central Command Module communicates with the on board computer on the quadcopter wirelessly, by sending MAVlink (Micro Aerial Vehicle Link) commands to it via a telemetry/control module integrated with it. The Radio frequency used in this wireless communication is the unlicensed Radio Frequency of 450MHz or 915MHz frquency depending on the manufacturers specifications, using FHSS(Frequency Hopping Spread Spectrum) Technolgy.

Programming (C/C++, Lua, Python)