Support System (UR) & System Architecture (UR)

Support System (UR)

1. Types of Sensors
- Environmental Sensors: Temperature, Humidity, Gas sensors.
- Positioning Sensors: GPS/GNSS, IMU.
- Proximity/Obstacle Sensors: Ultrasonic, LiDAR, IR.
- Optical Sensors: RGB, IR, thermal cameras, Multispectral.
- Specialized Sensors: Load, Pressure sensors.

2. Sensor Characteristics
- Accuracy, Precision, Resolution, Sensitivity, Range, Power consumption, Latency.

3. Alternative Power
- Battery Technologies: Li-Po, Li-ion, NiMH/NiCd.
- Fuel Cells: Hydrogen, Methanol.
- Solar Power: Used for long-duration UAV missions.
- Hybrid Systems: Combine multiple power sources.

4. Human-Machine Interface (HMI)
- Types: GCS software, handheld controllers, voice command, AR, mobile apps.
- Features: Real-time visualization, command interface, safety override.

System Architecture (UR)

1. Components
- Vehicle Platform: Airframe, chassis, motors, power source.
- Control System: Onboard computer, navigation, sensor fusion.
- Communication System: Telemetry, video, satellite, cellular.

2. Communications
- Types: LOS, BVLOS.
- Data Links: Telemetry, C2, payload data.
- Protocols: MAVLink, ROS, TCP/UDP.

3. Ground Control Station (GCS)

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- Types: Laptop-based, rugged tablets, fixed installations.
- Functions: Mission planning, monitoring, override, diagnostics, payload control.