Industry Solutions & Use Cases

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Mycelium's modularity and automation capabilities solve complex RF challenges across multiple sectors. This guide explores how Mycelium can be deployed to meet the needs of different industries.

Aviation: Integrated Surveillance and Data Links

Modern aviation relies on a dense web of digital protocols. Mycelium provides a unified platform for monitoring, logging, and analyzing these communications.

Use Case: Automated Flight Logistics & Logging

Problem: Airlines and ground crews need to track ACARS messages and ADS-B positions for specific aircraft and log them into a central database.

Solution:

1. **Directives**: Use `Extract_Variable` to pull aircraft registration from ACARS messages.
2. **Automation**: Use `File_Write` to dynamically create per-aircraft logs.
3. **Result**: A fully automated, lightweight ground station that builds a historical record of aircraft movements and status reports.

Use Case: Mode S & ADS-B Analysis

Problem: Researchers and security auditors need to analyze Extended Squitter (1090ES) data for anomalies or coverage gaps.

Solution: Deploy Mycelium with a high-gain antenna and use the built-in Mode S protocol to decode and export raw frame data in real-time.

Tactical & Defense: Identification and Signal Intelligence

In tactical environments, identification and response times are critical. Mycelium's Directive Engine allows for millisecond-latency automated responses.

Use Case: Automated IFF Interrogation & Identification

Problem: Verification of "Friend" or "Foe" (IFF) status requires rapid interrogation and precise analysis of legacy modes.

Solution:

1. **IFF Protocol**: Support for Modes 1, 2, 3/A, and C.
2. **Autonomous Response**: Configure a tool to detect interrogations and automatically reply with the correct altitude (Gillham encoded) or identification pulses.
3. **Result**: Rapid, programmable identification systems that can be customized for specific mission profiles.

IoT & Industrial Security: Auditing and Device Profiling

The explosion of low-cost wireless devices (433/868/915 MHz) has created a vast attack surface for industrial and home automation systems.

Use Case: Industrial IoT Security Auditing

Problem: Security teams need to audit various sensors (PWM, Manchester, PCM) to identify vulnerabilities or unauthorized transmissions.

Solution:

1. **ISM Generic Protocol**: Supports a wide range of modulations (PWM, Manchester, PCM, PPM) used in industrial controllers.
2. **Packet Splicing**: Use `Insert_Variable` and `Extract_Variable` to perform "fuzzing" or replay attacks on target devices.
3. **Result**: A powerful, portable security tool for identifying and mitigating risks in wireless infrastructure.

Maritime: Global Safety and Vessel Tracking (Coming Soon)

Future updates to Mycelium will include full support for the maritime sector.

Use Case: AIS & NAVTEX Monitoring

Problem: Port authorities and vessel operators need a robust system for monitoring vessel positions (AIS) and maritime safety broadcasts (NAVTEX).

Solution: Mycelium's upcoming Maritime Mission Pack will provide GMSK and FSK decoding for these critical safety links.

Conclusion

Whether you are tracking aircraft, auditing IoT devices, or managing tactical identification, Mycelium provides the **automated logic** and **protocol depth** needed to master the wireless spectrum.
