

Remote Surveillance with redundancy using Unmanned Vehicles

Andras Gyorffy MEng.
President & CTO

Executive Summary

- **Remote Surveillance**
- **Redundancy**
- **Unmanned Vehicles (UV)**
- **Current Remote Monitoring Systems**
- **UV Specifics**
- **Applications**
- **UV System Example**
- **UVS Integration Advantages**

Remote Surveillance

- **Follow the state of a process or system**
- **State described by variables**
- **Variables are measurements**
- **Generate events/notifications from measurements**
- **Monitor the events/notifications from a remote location**

Redundancy

- **on Vehicle level**
 - perception, communication etc.
- **on Monitoring System level**
 - Data Acquisition

Unmanned Vehicles

- **Land, air, sea**
- **Different sizes, ranges and degree of autonomy**
- **Communication between systems**
 - Military: JAUS & STANAG 4586
- **Increase:**
 - safety level
 - responsiveness
 - environment

Current Remote Monitoring Systems

- **Infrastructure**
- **SCADA**
- **Monitored remotely**
- **Decisions taken remotely**

UV Specifics

- **Localization**
- **Perception**
 - Process Data
- **Where should the Data Processing take place**
 - on-board
 - in the cloud

Applications

- **Perimeter Security**
- **Pipeline Surveillance**
- **Underground Surveying**

1. Perimeter Security

Current:

Cameras

IR Barriers



Problem:

Countermeasures for perimeter breach

2. Pipeline Surveillance

Current:

**SCADA – measure flow,
vibration etc.**

Problem:

Late detection



3. Underground Surveying

Current:

Static setup

Problem:

Slow rate



UV System Example



A screenshot of a UV system control interface. The main window displays a 2D map with a grid of streets, including "64 Avenue SE" and "40 Street SE". A red line indicates a path or mission route, with speed markers of "0.1 m/s". A blue "R" icon is visible on the map. The interface includes a "TARGET" panel on the right with a "Target_0" entry and buttons for "Disconnect", "Remote", "Mission", and "Start". Below this is a "STATUS" panel with a speedometer showing "0.00", a "Mission Time" of "00:01:17", and indicators for "COMM", "GPS", "Main", and "Auxiliary". At the bottom, there is a small inset map and a status bar with coordinates and the text "Reference GPS: Not Attached".

UVS Integration Advantages

- **Adaptability to changes in environment**
- **No infrastructure necessary**
- **Controlled level of autonomous decision making**

Questions?

Thank you!