The AT Ground Surveillance System (GSS) is an integrated network of sensors, cameras, and mesh radio network providing early warning alerts and visualization of potential threats. The AT GSS, when integrated with the AT SA Situation Awareness System, provides field users relevant real-time information similar to that available to coordinators in command bases stations. The combination of position, sensor alerts, video, and status from multiple sensors combined on one system screen provides significant efficiency to make rapid decisions in demanding operational scenarios.

AT GSS Sensor components

- **iScout®**
- **vWatch®**
- **Air-Drop Sensor**
- **Radio Transceiver**
- **IR Camera**
- **IP PTZ Camera**

The AT GSS provides both short-term and long-term deployment solutions without reliance on fixed infrastructure, enabling remote area monitoring and security alerts for critical assets and deployed teams. The AT GSS sensors can be used for applications including personnel, assets, facility perimeter, and border security monitoring, and intelligence and counter-intelligence, expeditionary and counter-insurgency tasks. Application examples include critical infrastructure such as Nuclear Plants, Refineries, Jails, Airports, Military bases, and Shipping Ports.

AT GSS Sensor component detail

**iScout®** - The iScout® is a small solar-powered, water-proof, point-to-point radio with advanced detection performance at a low price. iScout® takes less than 1 min to install and is the size of a deck of playing cards, making it simple to conceal. iScout® can be configured for seismic, acoustic, magnetic, tamper, and thermal detection. Any or all of these modes can be combined in a network of sensors integrated in the AT SA system.
Key features

- No operator set up other than sensor emplacement
- Interfaces with handheld user display
- Built-in GPS receiver and anti-tamper alarm

Technical details

Dimensions: 8.9 x 6.4 x 3.2cm
Weight: 0.2kg (200 grams)
Solar battery powered (uninterrupted performance 24/7 for 365 days a year)
Detection range:
  - PIR: up to 50m (person), up to 100m (vehicle)
  - Seismic: up to 50m (person), up to 150m (vehicle)
  - Magnetic: up to 7m (vehicle)
Rugged waterproof case (IP67)
-40C to +60C

vWatch® - vWatch® is a portable and remotely controlled image/video management systems that manages encrypted video distribution and video quality over the AT GSS network. When combined with the vWatch field unit a user can adjust PTZ and image detail settings and the system will dynamically adjust the data rate to match the available bandwidth and stream requirements.

The vWatch has several power supply options and a USB connector to power external devices. The vWatch® device is rugged and built to work in harsh weather conditions. A display shows the status of the unit and the IP address to provide confirmation on installation that the unit is streaming video to the server.

The Field Unit has the option of 4G LTE service, WiFi or wired links with smart data throughput management to control video streams over cellular links with monthly data limits.

The vWatch® Video Management Coordination Server and supports a large number of vWatch® Field Units. The Coordination Server stores the video for replay and analysis and distributes the video to many users for computer, tablet or AT SA Situational Awareness Terminals.
The vWatch® Coordination Server software consists of Microsoft server software, map server software, database management software, video viewer translation software, Web server software, Connection Manager software, target activity sensor Situation Awareness Display (SAD) software, OmniPush XML integration software, and encryption/decryption software.

Key features

- RF interface
- Two way secure IP communication (encrypted)
- Over the air configuration
- Provides Live Compressed Video to Multiple Distributed Users
- Self-Contained Solution with Video Compression
- Supports Pan, Tilt, and Zoom functionality of the camera

Technical details

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Power Input</td>
<td>10 to 20 VDC Max 60 Watts Power Consumption External Power Unit; Solar Charged Battery, AC to DC Converter</td>
</tr>
<tr>
<td>Power Output</td>
<td>Standard USB 2.0 Power</td>
</tr>
<tr>
<td>Video Output</td>
<td>RJ-45 IP Video Out</td>
</tr>
<tr>
<td>Status Display</td>
<td>Power Indicator Video Output Bit Rate Video Output Framing Rate Video Resolution; 1280x1024, 1024x768, 640x480, 320x240, 160x120 Network Connection Status</td>
</tr>
<tr>
<td>RF Output</td>
<td>TCP/IP</td>
</tr>
<tr>
<td>Size</td>
<td>16.5 x 17.8 x 5.7 cm</td>
</tr>
<tr>
<td>Weight</td>
<td>1.25 kg</td>
</tr>
<tr>
<td>Environmental</td>
<td>IP-65, Water Resistant, -40 to +60 °C</td>
</tr>
<tr>
<td>Sensor Triggering</td>
<td>900MHz spread spectrum transceiver and software integrated with iScout® wireless unattended ground sensors to trigger video when target activities are detected. The sensor data is multiplexed with the video sent to the user to support map based situation awareness displays.</td>
</tr>
</tbody>
</table>

McQ Air Drop Sensor

For hard to reach areas or for rapid deployment application, the AT GSS can be supplied with Air Dropped ground sensors. The sensors are dropped from either a fixed wing or helicopter aircraft and are designed to survive a freefall. The system has a self-contained mechanism to self-right upon landing.
Sensors are solid state, can be camouflaged and include surveillance, communications and also weather stations providing temperature, humidity, barometric pressure, visibility, wind speed and direction.

**Radio Transceiver** - The AT GSS mesh radio network delivers encrypted high-speed sensor-to-server communication for collection, transport and control of sensor data, as well as remote management and configuration of deployed sensors. The AT GSS radio transceiver uses 128 or 256-bit Encryption to deliver up to 100km line of sight range with intelligent network monitoring and user selectable frequency hopping sequence.

With extremely high data rate and energy independence, the AT GSS Radio provides a flexible, modular and mobile solution to traditional microwave networks. The system is optimized for image and video data exchange and is fully integrated with the AT SA Situational Awareness System and the Ground Sensors for powerful multi-level distributed networking.

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**Key features**

- **Multi-High Speed Data Rates**: Five RF Link Rates supporting throughputs from 80 kbps to 4 Mbps
- **Security**: 128-bit and 256-bit AES counter mode encryption
- **Long Range**: Up to 100km line of sight
- **User Selectable Hopping Sequence**: manipulate channel settings to assure highest performance
- **Built-in Spectrum Analyzer**: identifies potential interference and monitors network performance
- **Low Current Consumption**: 270 mA @ 12V in transmit and 100 mA @ 12 V in receive

**Technical specification**

**Transmitter**:
- Frequency Range: 902 to 928 MHz
- Output Power: 10mW to 1W; user selectable
- Data Link Range: 100 km
- Modulation: GFSK and 8-ary FSK
- Channel Sizes: 230.4, 345.6, 691.2, 1382.4, 3225.6 kHz
- RF Data Rates: 115.2, 250, 500, 1000, 4000 kbps
- Hopping Channels: up to 112; RF Data Rate Dependent
- Hopping Patterns: up to 16
- Hopping Rates: 400ms, 200ms, 100ms, 50ms, 25ms

**Receiver**:
- Sensitivity: -106 dBm @ 115.2 Kbps; -82 dBm @ 4 Mbps
- IF Selectivity: > 40 dB
- System Gain: 136 dB

**Data transmission**:
- Error Detection: CRC, FEC and ARQ
- Link Throughput: up to 2 Mbps
- Ethernet Rate: up to 2 Mbps
- Serial Rate: up to 250 kbps
Data Encryption 128-bit and 256-bit AES CCM
Protocol Proprietary CSMA

Interfaces:
Data Connectors: three RJ-45 (one Ethernet, two Serial)
USB Connector: micro USB
RF Connector: TNC

Power requirements:
Operating Voltage: +6 to +30 VDC (± 10%)  
Transmit Current: 270 mA @ 12 VDC  
Receive/Idle Current: 100 mA @ 12 VDC  
Max Power: 7W

General information:
Operating Temperature: -40°C to +60°C  
Humidity: 0 to 95%, non-condensing  
Dimensions: 7.52 x 4.31 x 2.52 in  
Weight: 750 g (transceiver only)

A range of IR and IP PTZ Cameras are available with many 3rd part systems compatible with AT SA depending on mission requirement:

Sensor products operating as part of the AT Ground Surveillance System are supplied by McQ Inc with overall system management and control by the AT SA Situation Awareness system.

AT Ground Surveillance System (GSS)