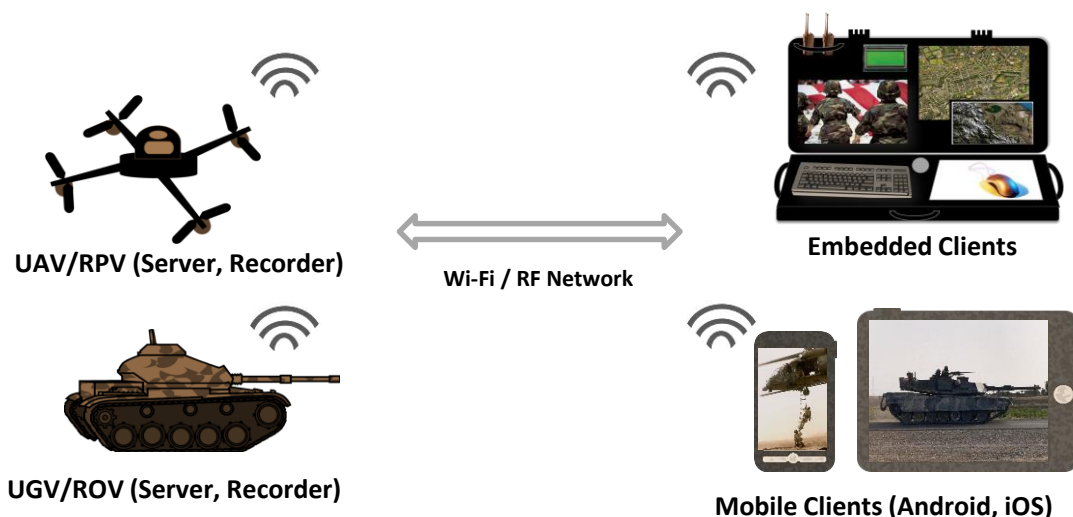


**Ittiam Systems** is a technology company providing cutting-edge **multimedia solutions** for a wide range of embedded products. With its offerings spanning across **codecs, multimedia SDKs, hardware platforms** and **turnkey systems**, Ittiam solutions are ideal for unmanned vehicles.

### KEY SOLUTIONS

- **Streaming Server** (Streaming live audio video feed to remote client/base-station)
- **Live Recorder** (Saving captured audio video to on-board storage)
- **Hybrid Server, Recorder** (Simultaneous streaming and recording)
- **Client** (Monitoring live / recorded streams from server / recorder)



### Ittiam Offerings (Server, Recorder)

- Optimized Hardware Designs
- Media SDK
  - **High quality video** encoding, streaming and/or recording
  - **Ultra-Low latency** streaming (50msec glass to glass)
  - **Multi-format** streaming & recording
  - **Adaptive streaming, Wireless streaming** (2.4/5GHz Wi-Fi, RF)
  - **Metadata** streaming & recording
  - Pre-event or on-demand recording
  - **High-quality images**  
Burst mode, periodic, on-demand
  - Content **security** / encryption
  - **Cloud upload** of recordings
  - Control via remote UI (client)

### Ittiam Offerings (Client)

- High-performance Hardware Designs for Embedded Clients
- Apps for mobile (iOS, Android) clients
- Media SDK
  - **Ultra-Low latency** streaming
  - **Multi-channel** playback (streams from multiple servers)
  - **Multi-format** audio / video playback
  - Picture in Picture (PiP), Picture and Picture (PaP), stacked **display modes**
  - **Adaptive streaming, Wireless streaming** (2.4/5GHz Wi-Fi, RF)
  - Jitter and packet-loss handling
  - **Cloud download** of recordings
  - Interactive **control** of UAV/UGV/RPV/ROV from client

## Hardware Platforms

- Ittiam has multiple **off-the-shelf hardware platforms** to realize servers (for unmanned ground systems) and embedded clients (for unmanned aerial or ground systems)
  - Reliable Operation (24x7, harsh operating/environmental conditions)
  - Field proven hardware IPs
- Multiple processor options
- Operating Systems: Linux, VxWorks, iOS, Android, Windows
- Optimized **custom hardware designs** for UAV/RPV servers, to support specific interface and form-factor requirements
  - Audio video I/O (HDMI, HD/3G-SDI)
  - RF modules
  - Control interfaces (SPI, CAN, etc.)

### neonCaster Gen II - **Clove**

- TI Sitara™ AM57x based compact, **low-power** processor module
- Ideal for:
  - Endurance / Short / Close Range UAVs/RPVs (Server, Recorder, Client)
  - UGVs/ROVs (Server, Recorder, Client)
- Size: 4.5" x 5.5" x 0.79" (114.3 x 140 x 20 mm)
- Weight: ~150 gram
- Power: 5-6W (Typical)
- Temperature Range: -30°C to +75°C (Operating)  
-40°C to +85°C (Storage)



### neonCaster Gen II – **Magna**

- TI DM816x based compact, **high-performance** processor module
- Ideal for:
  - Endurance / Short Range UAVs/RPVs (Client)
  - Close Range UAVs/RPVs (Server, Recorder, Client)
  - UGVs/ROVs (Server, Recorder, Client)
- Size: 3.5" x 5.5" x 0.84" (90 x 140 x 21.3 mm)
- Weight: ~90 gram
- Power: 12-15W (typical)
- Temperature Range: 0°C to +40°C (Operating)  
-25°C to +70°C (Storage)



### neonCaster I/O Boards (Nova) for Clove/Magna

3G-SDI/ HDMI® for video and audio input/output  
(Up to 1080p60 video)  
Gigabit Ethernet/ASI for streaming  
SATA, SD Card, USB for recording  
RS-232/RS-485 for control



# System Features

## Video Compression

H.264 up to HD: HP@L4.3  
 H.265 (HEVC) up to HD: MP@L4.0  
 MPEG-2 up to HD: MP@HL  
 MJPEG Baseline Sequential  
 JPEG2000 Progressive Mode

## Video Resolutions

1080p 60/59.94/50/29.97/30/25/24/23.96  
 1080i 60/59.94/50  
 720p 60/50  
 SD NTSC, PAL, VGA, QVGA, CIF, SIF, QCIF, QSIF

## Audio Compression

MPEG-1 Layer 2, AAC-LC/HE-V1/V2  
 Up to 48kHz audio

## Metadata

KLV Metadata  
 Video Ancillary Metadata

## Network Protocols and Streaming

RTP/RTCP, MPEG2-TS, RTSP, JPIP  
 HLS, MPEG-DASH, RTMP  
 RSVP, DSCP  
 Adaptive Streaming

## Secure Streaming

SRTP/SRTCP, HTTPS, AES-128, Digital Signatures

## Recording File Formats

MP4, MPEG2-TS, MXF, MOV, JP2, AVI

## Image File Formats

RAW, JPG, BMP, PNG, TIF

## Pre Processing

Image Stabilization  
 Moving Object Detection & Tracking  
 Removal of Fisheye Distortion  
 Contrast Enhancement, De-noising  
 De-interlacing  
 Resizing, Rotation, Mirroring, Cropping  
 Text/Image Overlay, Composition & Blending

## Advanced Features

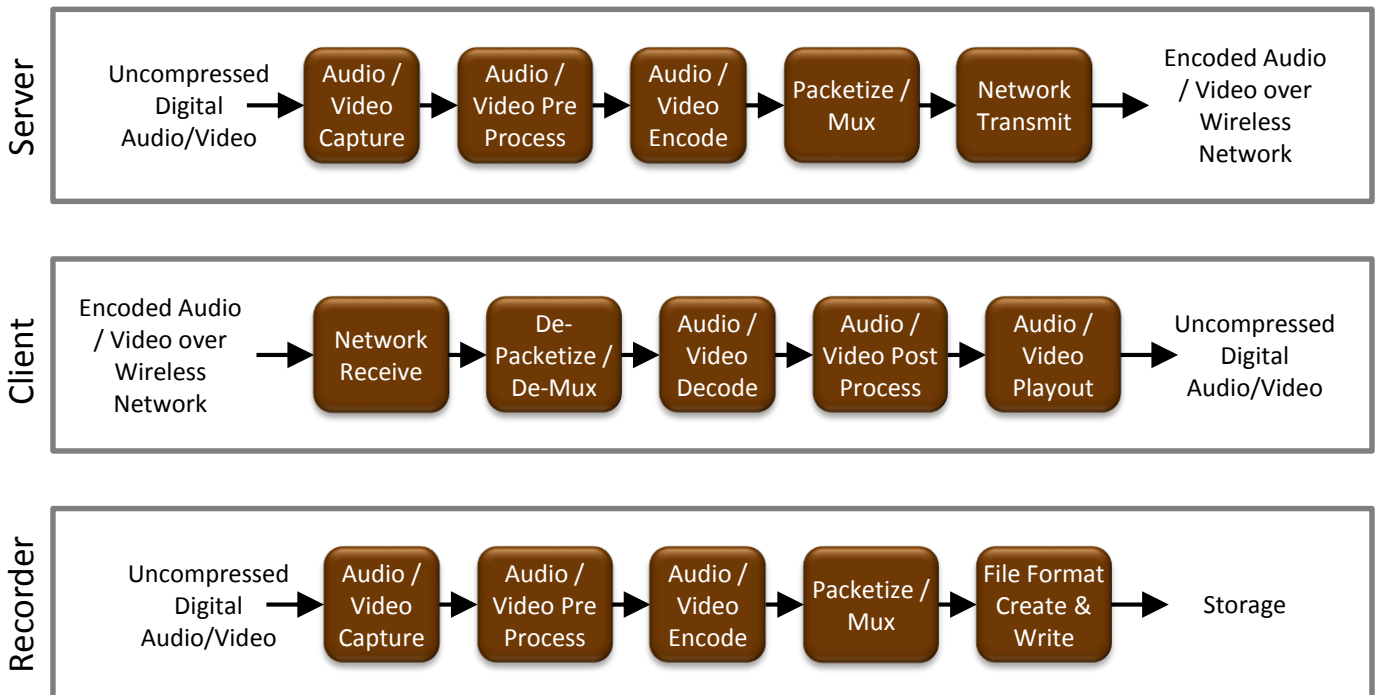
Split File Recording (power-failure safe recording)  
 Pre-event Recording  
 Burst mode/Periodic/On-demand snapshots  
 User Authentication

## System Management

Field Firmware Upgrade  
 Device Management  
 User Authentication  
 Statistics Reporting  
 Software Watchdog  
 Built in Self Tests

## User Interface

Network/Web UI



## Typical Applications

- Intelligence, Surveillance, Reconnaissance (ISR)
- Target acquisition, Combat operations, Surveillance
- Cinema, Videography, Photography
- Industrial monitoring, Hazardous Materials Monitoring, Monitoring Assets and Equipment Monitoring
- Roadside Medical Emergency
- Emergency / Disaster Relief Coverage, Land and Sea Search and Rescue
- Public Sports Events or Media Events
- Traffic Congestion and Accident Monitoring
- Wild life and agriculture research
- Land surveying & mapping (cartography)

## The Ittiam Advantage

### Reuse of pre-existing IPs to reduce

- Product realization timelines
- Time-to-market
- Overall program cost

### Flexible licensing, delivery options

### Field-proven, robust solutions for

- Ensuring predictable program timelines and cost
- Quick deployment
- Ensured product quality, performance

### Well established support

- Warranty
- Annual Maintenance Contract
- Source Code Escrow

For more information, visit [www.ittiam.com](http://www.ittiam.com) or contact Ittiam Sales

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