

GainSpan Video Application Development/Evaluation Kit

OVERVIEW

The GainSpan Video Application Development Kit (ADK) is a complete reference design that demonstrates a video streaming application based on the GainSpan GS1011M Wi-Fi module and associated embedded and mobile software suite. The video application works in conjunction with the GainSpan Video Application board, and allows customers to view video data on iOS or Android based smartphones. The Video ADK is suitable for applications such as baby monitors and security/surveillance systems.

The Video ADK includes the video application board, a complete hardware design package and software suite including embedded software and mobile reference applications for iOS/Android based smartphones. An evaluation version of the ADK, the Video Application Evaluation Kit (AEK) is also available that includes the application hardware and binary-only software.

The Video application board features the GainSpan Wi-Fi module, a video compression chip, a VGA imaging sensor chip, motion detector, single snapshot trigger button, WPS/Provisioning button and various LEDs to indicate modes of operation.

The Video embedded software includes the complete video application software and Wi-Fi and networking stack including mDNS/DNS-SD based discovery methods to discover devices and services available on the wireless network. The Video mobile reference applications showcase an RTP/RTSP based video player and provide customers a foundation to rapidly build custom features suited to their end application.

OPERATIONAL MODES AND USE CASES

The GainSpan module running the video application operates as a limited access point (Limited AP Mode) or as a client within an existing network infrastructure (Client/Station Mode).

In Limited AP Mode, the module forms a point-to-point connection with a smartphone client. Once the smartphone has established connection with the video ADK board operating in Limited AP mode, the mobile application discovers the video application profile being advertised by the embedded application and selects it to enable streaming of video feed from the camera to the smartphone. The mobile application features a custom player that plays the video stream from the camera. The Single Snapshot button on the application board can be used to trigger a still image to be taken and transmitted. The snapshot can also be triggered automatically on detecting motion using the on-board PIR motion sensor. The mobile application can be enhanced to support a “soft” button to trigger a single snapshot as well.

In the Client mode, the Video application board connects to an AP as a client. The smartphone, also connected to the same AP, now discovers the Video embedded application profile, and upon selection, starts receiving the video feed from the camera.

Both the Limited AP mode and client/station modes provide mDNS/DNS-SD based discovery methods. The embedded application advertises availability, and clients automatically discover the video profile and connect to it. Discovery allows clients to locate and connect to Video applications without the need to know the URL.



BENEFITS:

- **Complete Video reference design that allows users to stream the video feed from a camera to their iOS or Android based smartphones**
- **Accelerated time-to-market for development of new wireless video streaming applications such as remote security/surveillance cameras and baby monitors**
- **Quick and easy way to integrate video streaming services into end products using GainSpan Video Application board and embedded/mobile software suite**
- **Provides mobile platform APIs and reference source code to facilitate customized video application development**
- **mDNS/DNS-SD methods support discovery of devices and services available on the network without additional configuration**

FEATURES:

- **Video ADK consists of the Video application board, complete hardware design package, complete software suite including embedded software source and mobile reference apps**
- **Video AEK consists of the Video application board and an evaluation, binary-only version of the software and audio mobile app**
- **The Video embedded application operates in both Limited AP and Infrastructure client modes**
- **The Video embedded application advertises itself and allows automatic discovery by clients using mDNS/DNS-SD discovery methods**
- **Mobile Applications (iOS, Android) feature a dashboard for easy setup and camera selection and use an RTP/RTSP based video player**
- **The Video Evaluation board supports an H.264 video compression chip, a VGA imaging sensor, single snapshot and WPS/provisioning buttons, and LEDs to indicate status and mode of operation**

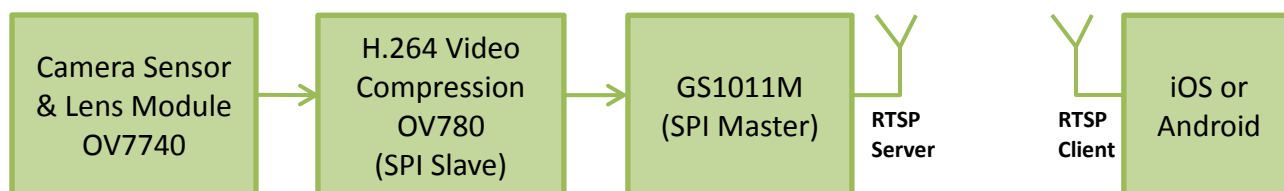
Provisioning of the GainSpan node in Limited AP or Client/Station modes can be done using web or mobile applications provided in the GainSpan Provisioning ADK. Over-the-air firmware updates of the GS1011M module-based Video can be performed using web or mobile applications provided in the GainSpan Over-the-Air Firmware Update ADK. The video ADK could be easily integrated with these GainSpan ADKs to support provisioning and over-the-air firmware upgrade.

GAINSPAN VIDEO SOFTWARE

The GainSpan Video ADK runs on the Video application board, and supports Wi-Fi video streaming to an iOS or Android smartphone. The GainSpan Video ADK embedded software is based on the GainSpan GEPS embedded firmware. The OV780 video compression chip compresses the raw video stream received from camera sensor to H.264 format and transmits this compressed data to GS1011M Wi-Fi module over SPI bus. Here GS1011M acts as SPI master and the video compression chip acts as SPI slave and all communication between the GS1011M and the video compression chip occurs via SPI. The Video application uses a custom RTP/RTSP based protocol for transmission of data to any client (iPhone/Android smartphone). The GS1011M module acts as RTSP server and the smartphone device as an RTSP client. The player allows a session to be established, streams video data, and supports PLAY and STOP functions.

On powering up the application board, the GainSpan Wi-Fi module establishes itself as a Limited AP. Users can browse to the list of available wireless networks on their client smartphones and connect to the Video application board. The video mobile application leverages discovery exposed by the Video embedded firmware application to enable automatic discovery of available video profiles and services.

The Video ADK includes source code for embedded video application software and iOS and Android based mobile applications, while the AEK includes binary-only embedded software and mobile apps.



Video Mobile applications

The Video iOS or Android based mobile applications showcase the video streaming capability of the GainSpan Video ADK. The application features an RTP/RTSP protocol based custom player that allows users to view live video data. When the app is launched, it discovers the video profile being advertised by the video application software and upon selection, launches the player that plays the video stream.



GAINSPAN VIDEO HARDWARE DESCRIPTION

The GainSpan Video ADK uses a GS1011M Wi-Fi module based Video Application Board that features the following components –

Components	Description
GainSpan Wi-Fi Module	GS1011M module streams video data over Wi-Fi
Omnivision OV780	Omnivision H.264 Video compression chip; Supports up to 30 fps VGA resolution
Omnivision OV7740 VGA Image Sensor and Lens module	Omnivision OV7740 VGA image sensor and lens module; Supports 640*480 video resolution
Microphone	Senses audio
PIR Motion Sensor	Triggers single snapshot on motion detected
Serial Flash	Used for storage of provisioning or custom application web pages and/or backup firmware
Switches and Buttons	Single snapshot button, WPS/Provisioning and Restore Backup Firmware
LEDs	Indicates Power On, Operation mode (Limited AP or Client) and Run/Program mode
USB port	Used to power the board and upgrade firmware on the Wi-Fi module

VIDEO ADK AND AEK CONTENTS

Components	ADK	AEK
Video Embedded Firmware Application	Binary and Source	Binary Only
Video Mobile Application for iOS/Android Smartphones	Mobile Application and Source	Mobile Application
GainSpan Video Application Board	Hardware	Hardware
USB Cable	Hardware	Hardware

Note: Smart Device is not included in the ADK or AEK.

VIDEO APPLICATION DEVELOPMENT MINIMUM REQUIREMENTS

Requirements	Type
GainSpan SDK Pro	Software Source, Tools
iOS Based Smart Device and Mobile Development Tools	Client Device, Tools

Note: SDK Pro is required to make any changes to the embedded application.

VIDEO ADK/AEK ORDERING INFORMATION

ITEM	PART NUMBER	Description
GainSpan Video ADK	GS ADK-Video-WEB	GainSpan Video ADK based on GainSpan GS1011M Wi-Fi modules
GainSpan Video AEK	GS AEK-Video-WEB	GainSpan Video AEK based on GainSpan GS1011M Wi-Fi modules