

Description : Bluetooth Video/Still encoding module using Serial Port Profile.

The patent is objective for integrated Bluetooth video/still camera module. The module encodes directly from a CMOS or CCD imaging sensor databus (RGB or YUV databus) and transmits the video data to a remote platform. The embedded bluetooth sub-system caters for Class 1 or Class 2 which directly affects the distance of transmission for 100 meters or 10 meters usage.

This integrated module simplifies the production of a small form factor bluetooth camera system. For example, the final system may be manufactured into an accessory for portable devices, example : mobile phones/PDA. Or, it can be used as a security camera that do away with the necessity of laying out cable in tradition wired security camera system.

The two main system architecture diagram is shown in Figure 1.

The module itself will contain the ability to encode the raw image data from the Image sensor, compresses it into a smaller sized data packet. Sends the data to it's built-in Bluetooth sub-system, which also embeds the necessary RF components to drive an external antenna.

The control functionality is coded on the microcontroller. The device itself can be placed at a distance, or, a short distance away. The user who is a distance away may activate the Bluetooth camera using a mobile phone/PDA/PC.

With such an application, the user need not be restricted to point his mobile phone at the object of interest. Instead, he may be viewing the streaming video from the bluetooth camera at a distance, and, with the luxury of snapping a high resolution picture.

The bluetooth system is Class 2 for a 10 meter range Bluetooth camera, and, Class 1 for a 100 meters transmission.



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The internal architecture is shown in Figure 2.

The module consists of a video compression engine which compresses the incoming raw video data (either RGB or YUV) into packets.

The micro integrated controller manages the communications between the remote host and also controls the video encoder. All protocol deciphering is done on the microcontroller.

This packet is sent to the bluetooth engine that re-transmit out the video to a remote host.

The bluetooth module either embeds the antenna or uses an external antenna.

To allow a further range of 100 meters, additional RF components is used to boost the range.

From the software perspective, a viewing application is built on the serial port profile shown in Figure 3. Using a serial profile is necessary due to it's simplicity and the wide available of portable system which have this profile already available.

Claims : Bluetooth Video/Still encoding module using Serial Port Profile.

This is the first integrated module to embed both the video encoding together with the bluetooth engine. With a simple addition of an external CMOS/CCD imaging sensor, it completes a bluetooth camera system.

The video is streamed on bluetooth serial port profile (SPP). The wide support of the SPP allows easy integration of this product into existing PC/Notebooks/mobile devices.

Both Bluetooth Class 1 and Class 2 are available to allow the user to have a transmission range of 100 meters and 10 meters.

This module directly encodes the imaging data from a CMOS (Complementary Metal Oxide Semiconductor) or CCD (Charge Coupled Device) image sensor through it's RGB (Red/Green/Blue) or YUV (Luminance/Chrominance) data bus and transmit it via Bluetooth to a remote viewing platform which is either a desktop personal computer, a notebook computer, a Personal Digital Assistant (PDA), or, a Mobile phone.