RESEARCH ARTICLE   OPEN ACCESS

Digital Video Monitoring System Based On ARM Cortex A7

R. R. Karhe, Gayatri P Sonawane
Assistant Professor, ME Student
Department of E & TC
Shri Gulabrao Deokar College of Engineering
Jalgaon –India

ABSTRACT
This paper describes the Video Monitoring system based on ARM Cortex A7.ARM Cortex A7 is the main board of the system.H.264 compression technique is used. For video input, camera Qhm 495 LM is used. In this paper the Introduction, need of the system, System architecture is explained.
Keywords:- SD, ARM

I. INTRODUCTION

Now a day's video monitoring is very much important in our life as they are used in banking, family security, finance, industries .This monitoring system are trying to make our life really easy and safe. The security of social life is maintained. Traditional monitoring systems are useful in for small distance communications. In Traditional monitoring systems Monitor and camera connections are made by using coaxial cable. Traditional monitoring systems are having some issues on structure, cost; stability. Traditional monitoring systems are replaced by the embedded technology which is image quality, communication distance and speed.

i .Block Diagram:

In this system, USB camera has used, ARM Cortex A7, PC, RJ 45 is used for monitoring the video in real time. And for interfacing between ARM Cortex A7 and USB camera, LINUX operating system has used.BCM 2836 chip is used as a microprocessor.H.264 coding technique is used. And software part is having LINUX kernel, and flash driver, boot loader and SD card.ARM Cortex A7 is the main of the system .Video data is taken by the USB camera and then using H.264 coding technique it is compressed and then it is transferred to the receiver, as ARM CORTEX A7 is controlling it. The data is received at the receiver after compression, and then it is displayed. Video data Transmission and Video data processing are the two main objectives of the system.

Fig 1 shows the ARM board. It has   following component connected to get output video.
1] HDMI to VGA converter.
2] Screen.

3] RJ 45
4] USB Camera.
5] Receiving client.
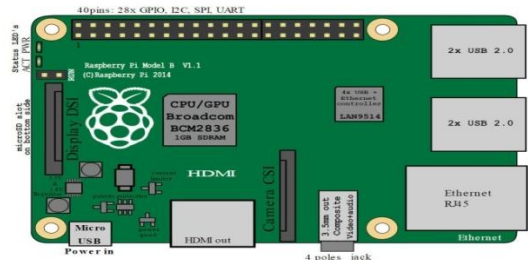6]5V Regulated Supply.

Fig 1: ARM Design Board

First of all we will see specifications of each component. HDMI to VGA converter:

Fig 2: HDMI to VGA Converter

HDMI is High defenition Multimedia Interface To VGA i.e. Video Graphics Array.It is digital to analog converter.Its a plug and play cable.Its design is flexible.

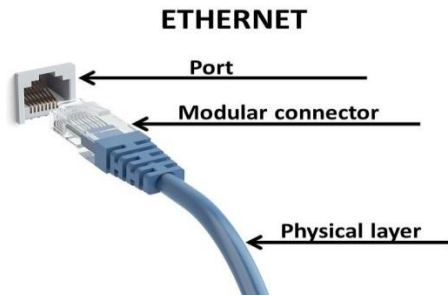RJ 45 : The Ethernet cable is used for connecting

Raspberry Pi with network.

Fig 3: RJ 45

Fig 4 : USB Camera

USB camera: In this system Qhm 495 LM camera is used. Whose resolution is 25 MP.

Screen: It is used for display of ARM Board. We can use PC or laptop as a screen.

Power Supply: In this system 5v -2A power supply is required. Any mobile charger with micro USB we can use for this system.

Receiving Client: It is the PC where we can get the video streaming. It is the receiver of the system.
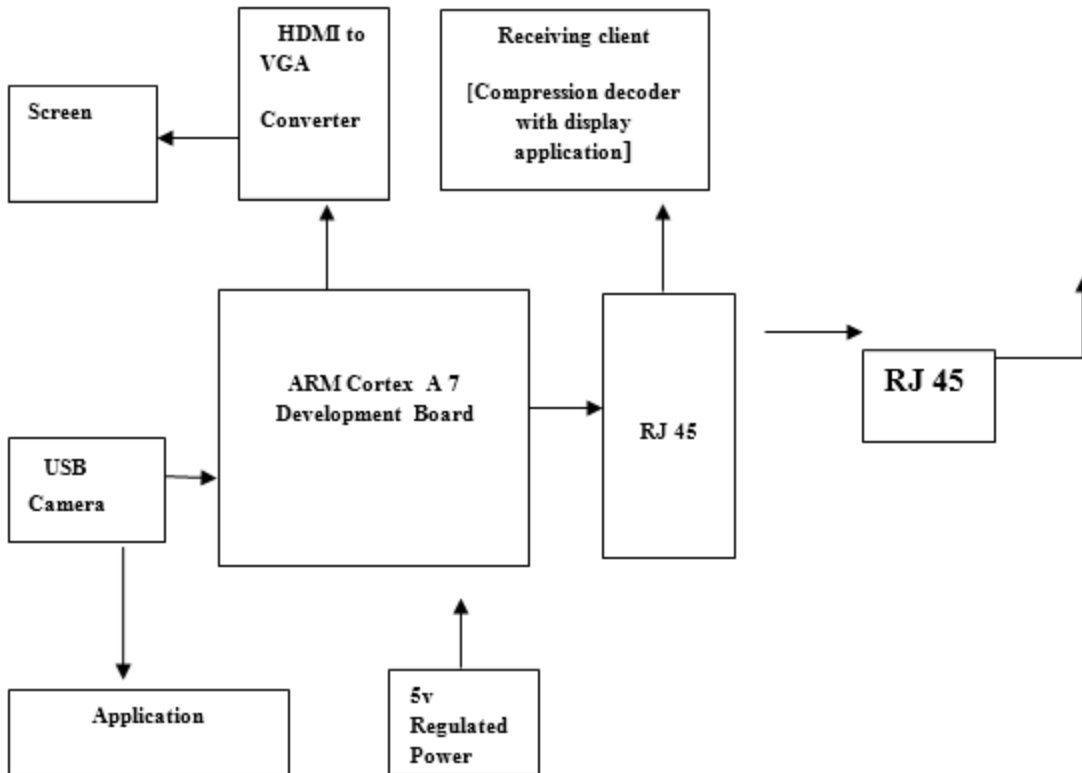

Fig 5: Block Diagram

II. ARM CORTEX A7 BOARD DESIGN

ii. Working Principle

The main goal of the system is to capture and transfer of the video without any time delay. For this USB camera has used which is interfaced to ARM board. Camera takes pictures or videos and transmits it using H.264 algorithm via ARM A7.

i. ARM architecture

In this system ARM Cortex A7 architecture is used .Broadcom BCM 2836 processor is used@ 900MHZ and upgraded RAM up to 1GB.The board is having in built camera interface it can be accessed using Qhm 495 LM.It uses 5 volt power supply. Using BCM 2836 multimedia encoding & decoding can be integrated. Its size is small having greater interface capability.
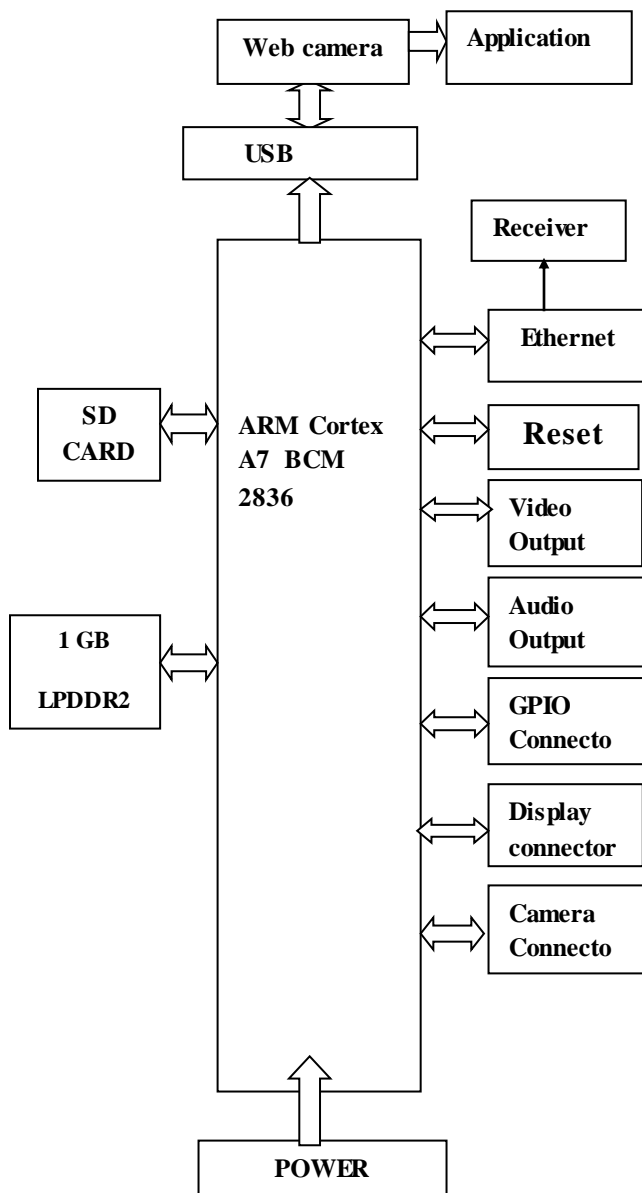

Fig 6 : ARM Cortex A7 development board

.Broadcom BCM 2836 is quad core processor @900MHZ.Availability of ARM platforms is easy in market as it has high speed & good video processing capability. Camera continuously captures video. Video will be transferred to BCM 2836 processor for further processing. In this system Peer to Peer Communication is used.

III. CONCLUSION

In the ARM architecture, there is in built Ethernet port to which will use RJ 45 for further processing. RJ 45 is the registered jack used in data communication applications. It is a 8P8C modulator connector. In the SD card main operating system Linux is ported. Used Linux as operating system.1 GB LPDDR2 is the memory of ARM.GPIO connector is the general purpose input output connector Providing GPIO pins as well as +3.3 V, +5 V and GND supply lines. It is having camera connector which is 15 pin MIPI serial camera interface. It is having the display connector which is Display Serial Interface (DSI) 15 ways flat flex cable connector with two data lanes and a clock lane. HDMI to VGA converter is used in this to provide the display to the ARM board.

REFERENCES

[1]   Shichang Du, Bianxia Li,"The Implementation of Remote Digital Video Monitoring System Based on ARM ll " 2012 IEEE fifth International Conference on Advanced Computational Intelligence(ICACI) October 18-20, 2012 Nanjing, Jiangsu, China

[2]   www.rs-components.com/raspberrypi

[3]   Raspberry Pi - Wikipedia, the free encyclopedia

[4]   RJ 45 - Wikipedia, the free encyclopedia

[5]   HDMI - Wikipedia, the free encyclopedia.

[6]   Rucha Bahirat, Amit Kolhe," Video Compression using H.264 AVC Standard ", International Journal of Emerging Research in Management &Technology ISSN: 2278-9359 (Volume-3, Issue-2)

[7]   Book : Joseph yiu, "The definitive guide for the ARM", Newness publication, page-552-555, Volume-2, PP.36- 42,2011.