VIDEO SURVEILLANCE SYSTEMS FOR FLEXIBLE AUTOMATED MANUFACTURING SYSTEMS

Sichitiu Irina, *Roşia de Amaradia Technological High School*, ROMANIA

SUMMARY: The present article proposes an introduction of video surveillance systems and their use in applications. Video surveillance systems are used from simple applications (here using just a camera) to the complex applications (used multiple video cameras). A practical application of these systems is represented by a mobile surveillance system controlled by a computer

KEYWORDS: manufacturing systems, video surveillance, video camera, flexible automation

1. INTRODUCTION

Actual technological fabrication systems need to adapt rapidly, continuously and efficiently to the frequent changes of products due to their modernization, in order to comply with the ever fluctuating needs of the clients, to maintain market competitively, resist tough competition and keep an acceptable level of profit, while fabrication series are reduced and the products are diversifying [1]. The use of computer-assisted technology in production processes, they lead to a development in flexible automation, the use of complex mechanical, electronics, informatics and automatics knowledge, that resulted in a new concept of Flexible Manufacturing Systems (FMS) Video surveillance systems are closed systems in which all components are directly linked [2]. The simplest video surveillance system is constructed from a video camera and a monitor it's liked to, through a coaxial cable.
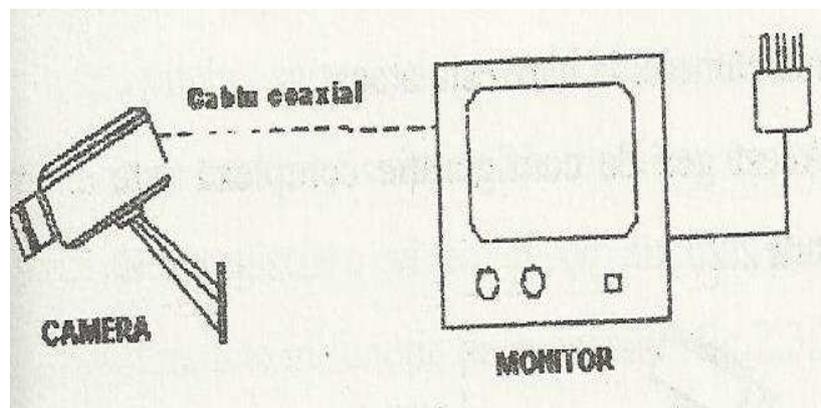
Figure 1. Basic configuration of a video surveillance system

The system can be extended with two, four or more cameras that can be selectively used via an image distribution device or a multiplexer through which a certain camera could be selected, manually or automatically.

One can select a certain camera, use the option of showing on the monitor screen of multiple images from several cameras or the option to show sequentially all images from all camera, within a set period of time. Also, the user can attach a microphone and a loudspeaker in order to capture sounds from the area under surveillance.
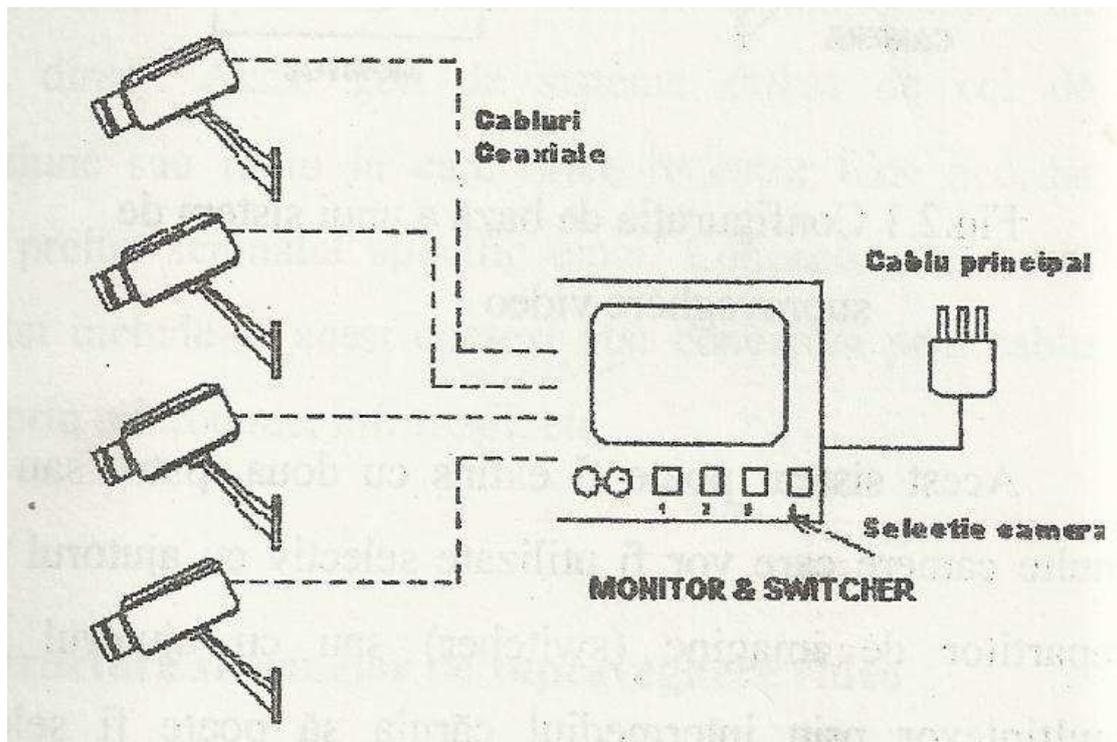

Figure 2. Video surveillance system with multiple cameras and a video commuter

The next step in developing this system is to add a video recorder which will record captured video, or, with a digital system that is monitored through a computer with a TV port, the images can be recorded directly on the hard drive as digital signals.

In this case, the recorded image is the one that is selected through the switch or multiplexer at the period one wants to record.
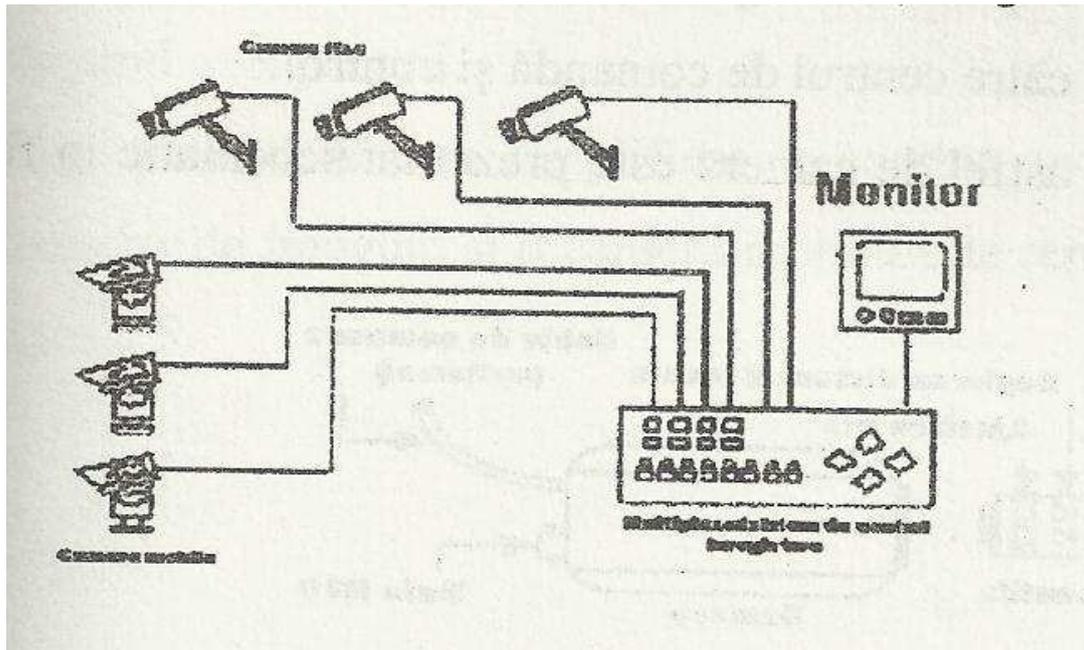
Figure 3. Complex video surveillance system

2. THE VIDEO SURVEILLANCE SYSTEM HARDWARE

A practical application of a video surveillance system comprises the model of a mobile video surveillance system, controlled by a computer through a program [3]. The goal is to use the mechanical, electronic and electrical components of a dot matrix printer in order to realize a mobile system linked trough a parallel port to a computer, so that it can be ordered through a program, the camera mounted on it being monitored in different ways.

System components structure:

1. A Topica video camera, Tp-606A/3 with the following specs:
   - Pickup device :1/3" transferred line;
   - Image elements: 510(H)x492(V);
   - Synchronization system: internal;
   - Scanning system: 2:1 interlaced;
   - Scan frequency: H: 15.736KHz V: 60Hz;
   - Horizontal resolution: 460 TV lines;
   - Noise level: over 48dB;
   - Minimal needed illumination: 0,04 Lux;
   - Power source: 220 V c.a.;
   - Video signal output:1.0 V, 74ohm BNC;
   - Size: 58(V)x50(H)x145(D)mm;
   - Focal distance automatically regulated lens and self-centering.

2. Dot matrix printer Epson Fx-1170 components:
   - A step-by-step engine;
   - tractor;
   - paper tension unit;
   - ribbon cartridge;

- electrical sensor for the detection of the end of the run;
- electronic board;
- electronic interface;
- power source;
- on/off and command system.
3. AMD-Athlon 1000Mhz computer ;
   - RAM memory: 128Mb;
   - Hard drive: Quantum Fireball 30 Gb;
   - Video card: ATI 8 Mb RAM with TV tuner and VGA port;
   - Monitor: Targa 17".

The software used to monitor and control the surveillance video camera of the flexible line offers the option to control the surveillance system in multiple ways.

The program is composed of two distinct sections. The first one, written in the Microsoft (R) Macro Assembler Version 6.11 programming language, saved as PGCM.exe, represents the most important part of the system and is actually the one through with the application is launched and controlled.

The second part, written in the DELPHI 2 programming language, offers a friendly user interface, launching the PGCM program and offers it the work parameters of the system that it established.

3. CONCLUSIONS

This paper present an introduction of video surveillance systems and their use in applications.

Video surveillance systems is used in following applications: protect employees (both directly and indirectly); protect the company, house, institutions, etc; to monitor employee productivity.

In present the video surveillance systems did the move from standard-definition (SD) analog equipment to high-definition (HD) CCTV and network equipment, the result being important in the image quality.

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