

The Advantages of Direct, Event-Controlled Recording

(January 31st, 2005) The MOBOTIX camera concept is distinctly different from that of conventional IP cameras and offers considerable advantages in system design thanks to the integrated event control and ring-buffer recording. Major system advantages include low costs, minimal network load, low breakdown rate and unlimited scalability at any time. Above all, however, the recording performance is significantly superior to the traditional centralized PC systems.

Traditional Storage via FTP

A conventional IP camera (web cam) generally stores an image or image sequence on a server using the standardized FTP protocol. This process is better suited to occasionally storing images rather than recording video sequences in ring buffers and is commonly used in web applications to refresh "live" images on the Internet.

Contrary to MOBOTIX cameras, when such "regular" IP cameras are used in security applications, they require a central PC with additional video management software. The MOBOTIX concept, which is based on direct event-controlled ring-buffer storage onto a network PC, offers significant advantages, as this article will illustrate.

Naturally, the MOBOTIX camera also supports FTP transfers, with the additional possibility to automatically generate date and time-based file folder structures and file names. Images or image sequences can also be sent via e-mail.

Event-Controlled Recording Saves Storage

The MOBOTIX camera is equipped with an integrated scheduling and event control system so that the storage process via FTP or e-mail can be event and time-controlled as well. The events can come from internal sources or be triggered by external signals such as a switch or a network message. Internal sources include video motion detection, sounds detected by microphone, the passive infrared sensor, temperature and other signals. Additionally, it is possible to set recordings for certain intervals or at particular times in an hour, a day or a month.

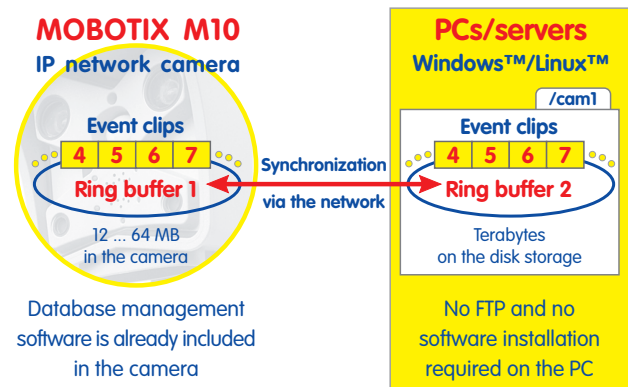
The Difference: Ring-Buffer Storage Included

One of the major advantages of the MOBOTIX camera is the direct ring-buffer storage on a PC or server accessible via the network. This means that each camera independently manages its own storage space in the form of a file folder on a PC without requiring any additional software (on the PC). The maximum storage space available on the PC for the long-term ring buffer can amount to several hundred gigabytes and is administrated by the camera.

Old recordings are automatically deleted in the ring buffer by the camera itself when more space is needed or when the individual recordings expire. The MOBOTIX system also supports PCs and servers running on Linux or Windows operating systems.

Fail-Safe Thanks to Temporary Buffer

Regardless of the type of storage used, the MOBOTIX camera always initially stores its recordings in a temporary ring buffer. Thus, the system is able to bridge network failures lasting several minutes or a short shutdown during network component maintenance, even including the replacement and restart of a recording PC, without any lost images. In terms of security, this technology gives the MOBOTIX camera a considerable advantage over the wide-spread central recording systems using PC software.



The failure of a camera or the recording PC is immediately registered by the MOBOTIX cameras in the network, and an alarm is issued in the signal display (LED, voice output) or forwarded to the administrator via e-mail or telephone. Should a recording PC break down completely, the system can be automatically switched over to a backup PC.

The settings for the recording PC (network address, maximum storage space, expiry time) are easy to access in the camera's administration menu using the browser.

Recording Playback via the Browser

The camera's playback view can be used to view the recorded events via the browser or to search for any particular sequence. In this case, it doesn't matter whether the information is stored internally or externally in a ring buffer on a PC or server - the system switches over automatically.

This direct access via the camera offers a high degree of security, particularly in large networks with many users, since only the camera and not the individual user needs the access privileges to the recording PC/server.

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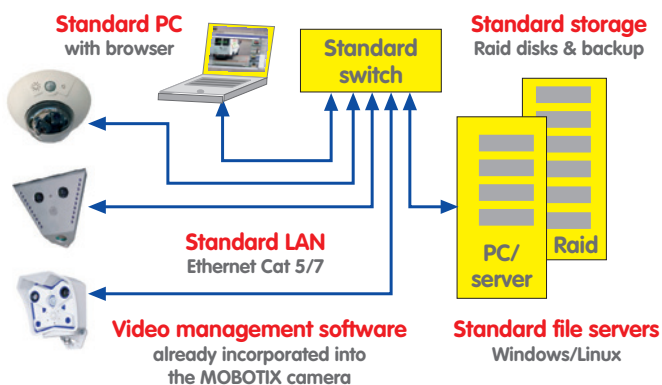


Variable Recording

In the MOBOTIX camera, recording images or image sequences is controlled by flexible time tables that the user can configure using a standard browser. A key switch linked to the camera's signal input can also work together with the timetables. Once the system has been activated, recording can be

- started,
- stopped or
- re-triggered

by a freely-definable number of internal or external events. For example, a door switch can trigger the recording for a pre-determined period that can be extended by motion detection in the video image. Events can also be filtered so that they will not act as triggers unless they occur more frequently within a certain time period than the minimum number specified. This variability in choice of event and filtering reduces the number of unnecessary recordings significantly.



Recording Processes

Three different recording modes are available in the MOBOTIX camera:

- Snapshot recording with pre- and post-alarm images, but no sound;
- Event clip recording with sound and variable frame rate;
- Continuous recording with sound and event-controlled frame rate.

These recording modes are independent of the type of encoding (JPEG, MxPEG). MxPEG provides the highest frame rates and most effective storage.

In addition to event-controlled recording, the camera can capture time-lapse images in the ring-buffer storage – even with an image format different from the live image.

Snapshot with Pre- and Post-Alarm

Snapshot recording captures the image triggered by the event as a single JPEG image in an individual file. Additionally, up to 50 pre- and post-alarm images taken at fixed intervals can be stored in individual files. These images (files) can then all be put in a file folder that carries the event's number.

The advantages of snapshot recording are the low storage requirement for the individual image and the maximum interval between the pre- and post-alarm images of up to 10 minutes. Since

the images are stored as individual JPEG files, the file directories can be accessed not only with the integrated playback functions via the browser, but manually as well, or with the help of other programs. The disadvantage of using snapshot recording becomes apparent when recording frequent events with many pre- and post-alarm images. The large number of files and folders created are recorded on the PC/server, which, particularly when several cameras are being used, can quickly reach its performance limit.

Event Clip With Audio

Event clip recording captures a video and audio clip of variable length. This process is the standard operating mode in security technology; the camera does not start recording until an event has occurred in the scene. With pre-event recording, it is also possible to record events up to 10 seconds prior to the event. Regardless of the previously set live frame rate, the recording frame rate can be adapted to accommodate the requirements and the amount of storage capacity available.

The event clips are stored on the PC in clips (files) of maximum 10 seconds in length, which significantly reduces the number of files produced (compared to the snapshot recording with pre- and post-alarm images) and increases the efficiency of the recording PC ten fold. Since the internal camera ring buffer reduces the network peak load, some 100 cameras can store the event-controlled recordings on a single PC.

Continuous Recording Based on a Timetable

Continuous recording captures video for a specific time set during a week, e.g. Monday through Friday from 8 a.m. to 6 p.m. The recording frame rate can be set to differ from the live frame rate, and can be as low as 0,2 frames per second. Additionally, an event will automatically increase the frame rate to up to 25 frames per second.

Using this efficient process, it is possible for approximately 30 cameras to simultaneously record live video stream with 25 frames per second with audio on a standard PC (P4, 2.8 GHz). In combination with a powerful server PC and a Raid disk system, the number of cameras used can be further increased.

Bottom line: Simplified Concept and Greater Performance

Recording direct event-controlled video and audio clips with variable recording lengths with the MOBOTIX system optimizes storage capacity requirements and is one of the biggest advantages of the MOBOTIX camera. Since this is achieved without requiring any software installation, directly through the camera via the network to any Linux or Windows PC, MOBOTIX simplifies the design concept of large video surveillance systems enormously.

Compared to a conventional centralized solution using a central PC and video management software, the MOBOTIX solution offers:

- lower system costs,
- greater performance,
- lower network load,
- considerably higher resistance to system failure,
- and unlimited scalability.