DESIGN GUIDE

AXIS Camera Station Bundle:
AXIS M1011, AXIS M1031-W Network Cameras

Installation example – Basic requirements

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1. Purpose and scope

This document describes the use of AXIS M1011 or M1031-W Surveillance Kits in a smaller retail shop. It explains the motivation for an IP-based surveillance system. Questions like placement are addressed; the necessary infrastructure is also listed.

2. Motivation

An IP-based video surveillance system helps retailers address several challenges and maximize their profits, for instance by:

> Minimizing external and internal loss. A 30-50% shrinkage reduction has a very positive impact on the final result.
> Making high-quality video evidence quickly available, so that investigation times can be minimized.
> Providing a cost-effective video surveillance system that is easy to install, scalable, flexible and future-proof.
> Monitor customer attention provided by the staff.

3. IP-based video surveillance vs. analog

Future-proof solution
AXIS Camera Station is installed on a standard PC, which reduces response times and simplifies upgrades/replacements (as opposed to when using proprietary equipment such as DVRs.)

Scalability
Cameras and licenses can easily be added one by one. The system hardware can be expanded to meet increased performance requirements.

Reduced storage needs
In order to offload the recording server, the processing power in the network cameras can be used for motion detection. Some Axis network cameras, including the AXIS M 1011 and AXIS M1031-W, support H.264 to further reduce storage and bandwidth need.

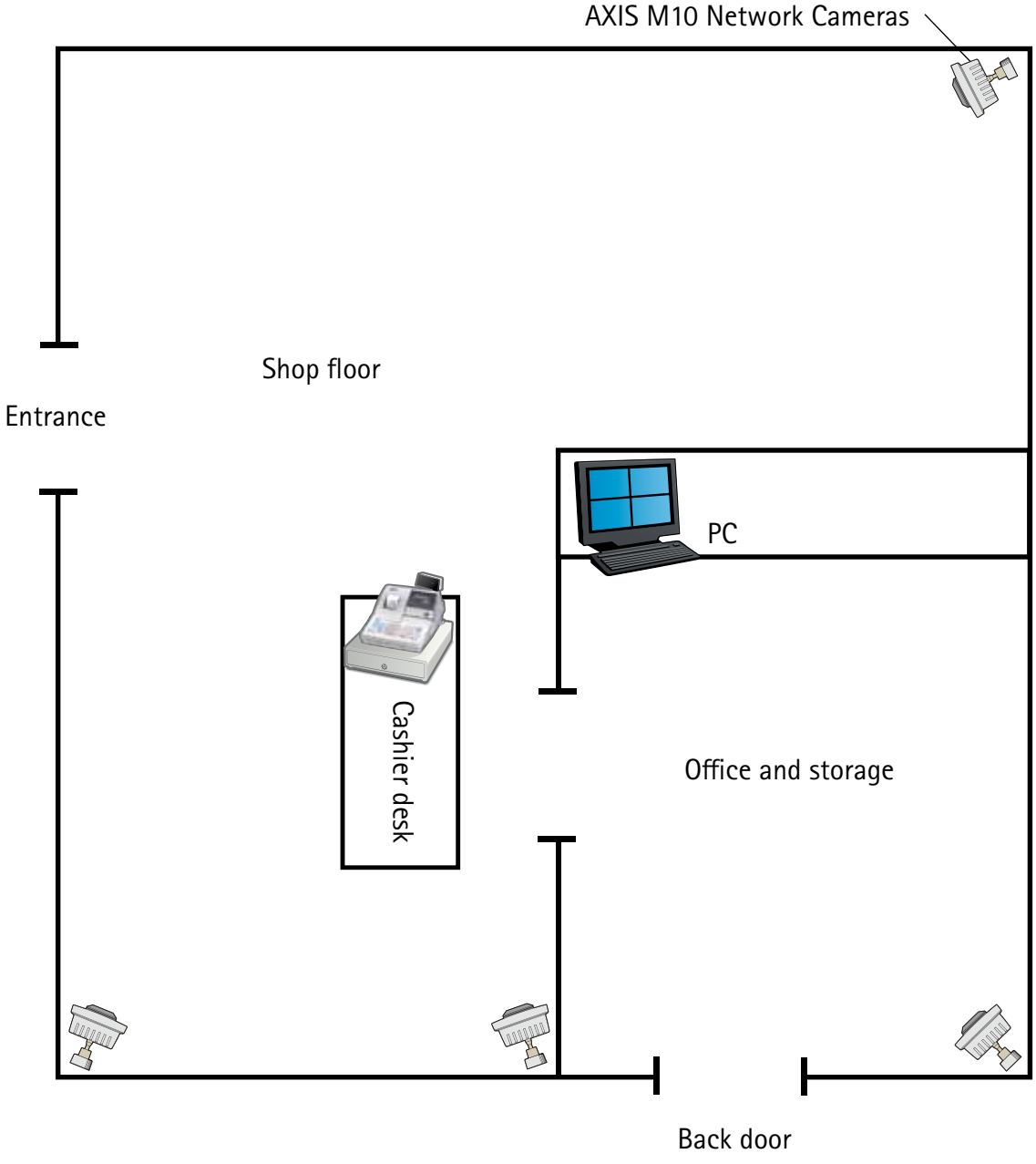
Image quality
Using progressive scan and megapixel resolution, network camera technology has surpassed the image quality of analog cameras used with DVRs.

Lower installation costs
Most facilities are already wired with network cables, thus an IP-Surveillance solution requires no additional wiring. Using standard PC and server hardware for video recording and storage, rather than proprietary equipment such as DVRs, radically reduces management and equipment costs.

Power over Ethernet
Most Axis network cameras offer a Power over Ethernet (PoE) option, which allows you to power cameras through the network and eliminate the wiring needed for electrical outlets. AXIS M1011 and AXIS M1031-W require a PoE splitter to separate power and data.

4. The small-size retail shop scenario

What do you need to see? This basic question must have a very clear answer when choosing positions and orientations. In this illustrative design the complete shop plus adjacent areas are covered by 4 cameras.



5. Identification vs. Overview

It is important to understand what the purpose of the camera is. Cameras can typically be used for identification and for general overview (safety and security). When designing a system, one should consider that a camera placed for identification purposes rarely functions as an overview camera and vice versa.

6. Camera placement and considerations

Place the cameras to cover as large area as possible, pay special attention to careful surveillance of the cashier desk and the entrances. Correct camera mounting ensures that image quality can achieve its full potential, but here are some factors to consider when planning a camera's position.

> Make sure the camera is correctly positioned to achieve its objective.
> Add light, if needed
> Avoid direct sunlight
> Avoid backlight
> Adjust camera settings to obtain an optimal image

7. System design

The system consists of the following components:
> 4 network cameras (AXIS M1011 or M1031-W)
> Cabling
> Bandwidth and storage
> Axis Camera Station video management software
> A PC to run the AXIS Camera Server and Client
> Switch

8. Camera selection

AXIS M10 Network Camera Series

AXIS M1011 and AXIS M1031-W offer superior video quality in its class. These small and smart network cameras are perfectly suited for securing boutiques, restaurants, hotels and residences.

Highlights	AXIS M1011	AXIS M1031-W
Easy installation, functional and smart design	●	●
No motion blur with progressive scan	●	●
Compatibility and future proof H.264, Motion JPEG and MPEG-4	●	●
Wireless connectivity (WiFi)		●
Detection of movement in the dark (PIR sensor, White LED)		●
Built in microphone and speaker		●
Playing of recorded audio clip		●

9. Cabling

Cable should be planned using shielded Cat 5e, and retailers can future proof by deploying Cat 6. This way the network can grow and include Gigabit devices without the huge costs of re-cabling.

10. Bandwidth and storage

For the sake of illustrating storage and bandwidth calculations within this document the following parameters have been chosen:

> 14 hours of recording a day
> 6 fps continuous recording
> H.264 encoding with compression 30
> 640x480 resolution
> Video retention for at least 30 days

A sample storage calculation for the continuous recording case uses an average bandwidth of 155 Kbits/s:

$$\text{Storage} = \textit{bandwidth} \times \textit{time} \times \textit{number of cameras}$$

$$= \frac{155 \textit{Kbit}}{\textit{s}} \times 30 \textit{ days} \times 4 \textit{ cameras} \times \frac{1 \text{ byte}}{8 \textit{ bits}} \quad \frac{14 \text{ hours}}{1 \text{ (working) day}}$$

$$\times \frac{3600 \text{ seconds}}{1 \textit{ hour}} \times \frac{1\text{Giga}}{1048576 \textit{ K}} = 111.8 \text{ Gigabytes}$$

A similar calculation for event triggered recordings should be performed. In this case higher frame rates or resolutions might be used.

Changes in frame rate, encoding standard, compression or days of recording can greatly affect the storage needs. Worst case scenarios should be considered ensuring that space won't become scarce. As a rule of thumb hard drives should have *at least 10% of free space* to work effectively.

Visit www.axis.com/products/video/design_tool/calculator.htm to find out the actual bandwidth and storage needs for your application

11. Software

AXIS Camera Station software
AXIS Camera Station is an easy-to-install and intuitive video management software, including all the necessary features for trouble-free monitoring and surveillance. When the surveillance system calls for expansion, network cameras can simply be added to the IP network.

Minimum Recommended Requirements
For best performance and stability these minimum requirements must be met.

Hardware Client PC:
> Windows Vista Business, XP Professional
> Windows Media Player 11
> CPU: Intel Pentium 4 or higher, 2 GHz
(Intel Core 2 Quad recommended for larger systems)
> RAM: 1 GB (4 GB recommended for larger systems)
> Screen: 1024 x 768
> Graphics card with DirectX 9.0c; Onboard video memory of 256 MB
Important! Use latest graphics card driver.
> Microsoft .NET runtime environment (included in installation package)

Hardware Server PC:
> Windows Vista Business, XP Professional, Server 2008, Server 2003
> CPU: Intel Pentium 4, 2 GHz (Intel Xeon recommended for larger systems)
> RAM: 1 GB (4 GB recommended for larger systems)
> Microsoft .NET runtime environment (included in installation package)
> NTFS formatted hard drives

Network:
> 100 Megabit Network
(Gigabit Network recommended for larger systems)

Hard disk configuration:
> At 30 fps in VGA up to 15 cameras per hard disk

Note: Make sure to always have the latest service packs installed on your system.

12. Conclusion

Please keep in mind that this guide is made as an illustrative example of a mid-size retailer and intended to help in the design process. When designing your own system keep this checklist in mind.

> Define your surveillance needs
> Network camera selection
> Hardware components
> Software
> Operations and maintenance

13. Helpful links

> Axis Communications: www.axis.com
> AXIS Design Tool: www.axis.com/products/video/design_tool/index.htm
> Total Cost of Ownership (TCO), Comparison of IP- and analog-based surveillance systems:
www.axis.com/files/whitepaper/wp_axis_tco_31196_en_0802_lo.pdf

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www.axis.com

About Axis Communications

Axis is an IT company offering network video solutions for professional installations. The company is the global market leader in network video, driving the ongoing shift from analog to digital video surveillance. Axis products and solutions focus on security surveillance and remote monitoring, and are based on innovative, open technology platforms.

Axis is a Swedish-based company, operating worldwide with offices in more than 20 countries and cooperating with partners in more than 70 countries. Founded in 1984, Axis is listed on the NASDAQ OMX Stockholm under the ticker AXIS. For more information about Axis, please visit our website at www.axis.com