



POS System Integration With MOBOTIX And Vectron

System Overview, Initial Operation, Examples – Guidelines For A User-Friendly Video-Based Retail Solution At The Point Of Sale (POS)



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1. Motivation



Integrating Vectron POS systems into the MOBOTIX system makes it easy to combine POS transaction data and video data in a convenient, easy-to-operate and highly efficient way. TCP/IP network communication does away with the need for serial cabling between the camera and POS. Everyday issues, such as disputes regarding correct change, can be clarified for both parties involved (the customer and cashier) in a quick, uncomplicated way that leaves no room for doubt.

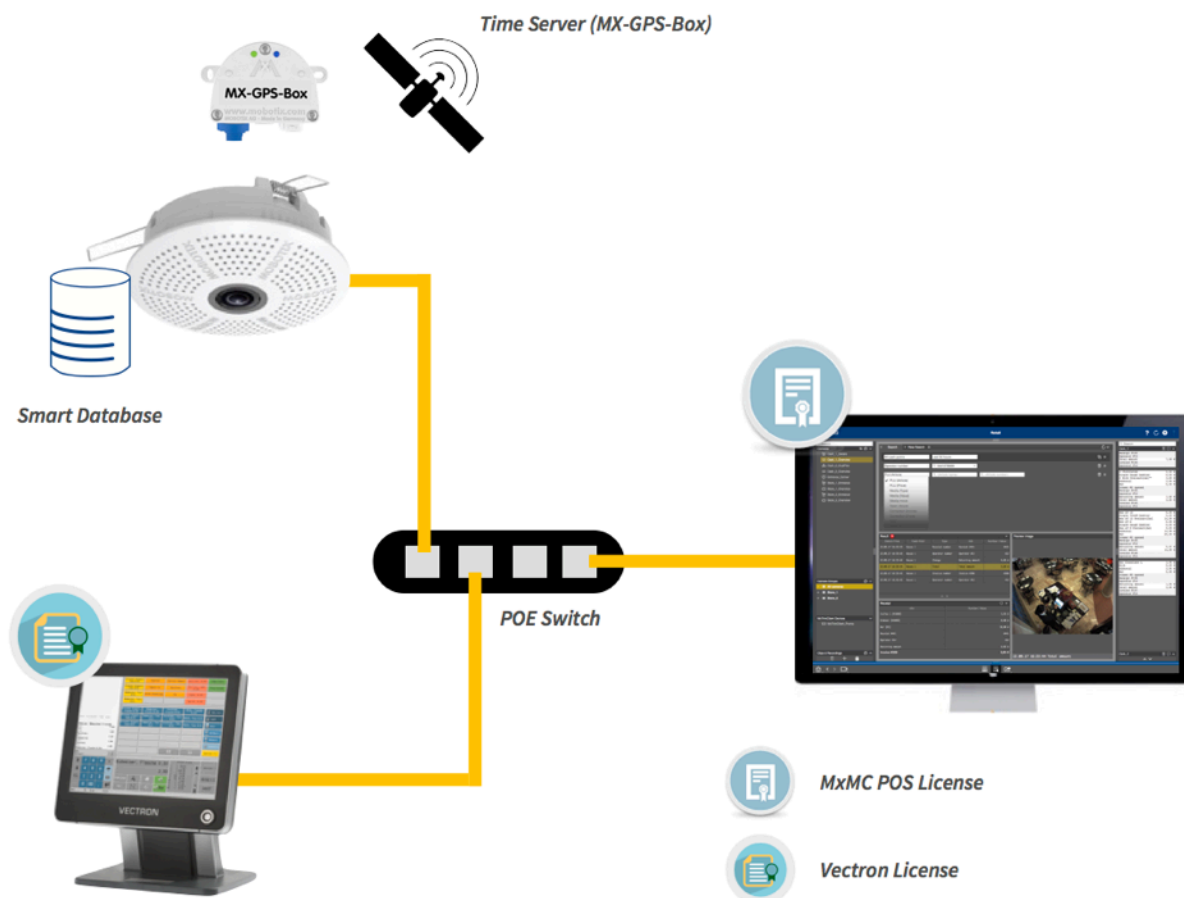
Combining the two systems requires a few basic prerequisites and dependencies that will be described in this document. The basic concept underlying the integration is to provide cost-effective video security for small shops with up to two POS systems as well as to provide the option for the shop manager to evaluate the POS data either locally or remotely. Integration with the database systems of very large-scale POS systems is not currently planned. MOBOTIX cameras have a known advantage: A single camera can monitor an entire sales area. Furthermore, there is now the option to integrate the POS data from a Vectron POS system into the video security system in the POS area.

Support For Optional POS Functionality for MxManagementCenter (MxMC) 1.7 and later

MxMC version 1.7, which was released in February 2018, is the first MxMC version to offer a practical, affordable POS video solution ideal for retailers and restaurants. It allows transaction data from a Vectron POS system to be searched based on numerous criteria and linked to corresponding video images. To make full use of a MOBOTIX Mx6 camera with POS integration, the camera software must be version **MX-V5.0.2.14** or later.

The following sections contain detailed descriptions of the cutting-edge, high-performance POS video solution made up of MOBOTIX and Vectron products.

2. Overview And Description Of Entire System

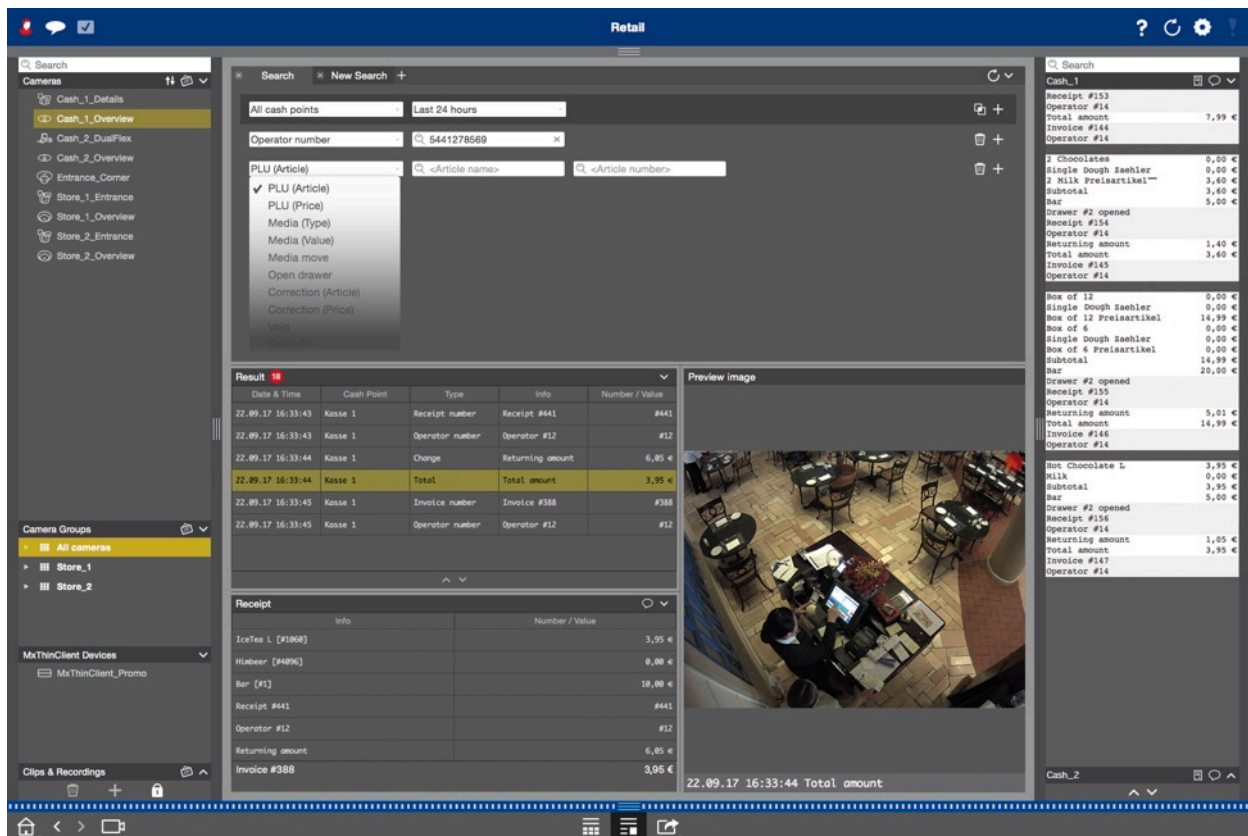


MxManagementCenter (MxMC)

The intuitive video management system for Windows and Mac OS is a proprietary MOBOTIX development, making it perfectly suited for MOBOTIX cameras and their unique range of functions. Each new version of MxMC contains valuable new functions and can be downloaded from the MOBOTIX website free of charge, together with release notes containing detailed information. The most important feature as of version 1.7 is support for POS functionality through direct integration of Vectron POS systems via an appealing license model.

Prevention, Analysis And Sales Optimization: Integration Of POS Into The MOBOTIX Video Security System

Recent studies have shown that nearly €4 billion is lost yearly as a consequence of annual inventory differences in the retail sector in Germany alone (source: EHI Retail Institute). The use of intelligent video security is becoming increasingly important for retailers and restaurateurs, as seen in more than €1 billion in investments in preventive and security measures. An intelligent IP video solution from MOBOTIX opens entirely new avenues above and beyond traditional protection. MxMC can also be supplemented with a POS solution – this only requires minimal effort and a **one-time licensing** fee. This involves transferring transaction data from a modern, networked POS to a MOBOTIX camera and storing it in the camera's video data memory.



MxMC (versions 1.7 and later) offers a fast and easy-to-use search and sort function for transaction data from the POS system. It can be accessed via the new **Retail View** and the collapsible and expandable **Retail Bar** on the right (see image above). Checkout processes can be analyzed based on item, price or employee, for example. MxMC searches POS data for keywords and delivers videos or images related to the corresponding transaction. The files can then be **played back immediately** and **exported**. This enables disputed cash transactions to be documented to provide evidence. The exported videos can be played back **without** the need for a POS license. Detailed information on **how to use the POS functionality** via the Retail View and Retail Bar can be found on the MxMC help pages. Open these by clicking **?** in the top right corner in the program's header bar.

Examples Of Typical Applications:

- **Quickly check whether the correct change was given:** A customer complains that they paid with a €100 bill but only received change for a €20 bill.
- **Search based on amount, item, form of payment:** Photos to serve as evidence for sales that exceed a certain amount, cancellations, void receipts, cases where the cash register is opened without a sale, card payments and to check whether IDs were checked for sales of items with age restrictions.

Joint Solution Developed With Vectron (www.vectron-systems.com)

Vectron, the leading provider of point of sale systems (POS) in bakeries and restaurants, has developed a joint solution for POS integration with intelligent IP cameras from MOBOTIX and MxManagementCenter. All users of a current Vectron POS system can already take advantage of the convenient MOBOTIX solution with just a single Mx6 camera, MxMC (free of charge), an additional POS license and the corresponding Vectron POS license.



The Benefits Of The MOBOTIX/Vectron Solution:

- A complete solution that is simple and scalable.
- Secure storage of encrypted video data directly in the camera or on a server/NAS/PC.
- Real-time transfer of all relevant transaction data from the POS order
- Rapid identification and resolution of POS differences, as well as a preventative effect.
- Compatible with all current Vectron POS systems and MOBOTIX Mx6 cameras (firmware version MX-V5.0.2.14 or later).
- Convenient evaluation of video images on-site in the office (via MxManagementCenter) or **anywhere in the world** via the Internet from any other MxMC workstation.
- Support for license-free, encrypted access to video data from the camera (playback, live images) from any Web browser.
- Local use in branch offices or easy access from headquarters (ideal for branch monitoring).
- MOBOTIX offers a 30-day demo license free of charge for testing the POS functions in MxMC.

How The POS License Model Works

To make full use of the POS solution with MOBOTIX MxMC, you need the following basic setup:

- A MOBOTIX Mx6 camera with MX-V5.0.2.14 firmware or later,
- MxMC 1.7 or later (download free of charge from the MOBOTIX website).
- An MxMC POS license (**valid for an indefinite period** for a Vectron POS system at an MxMC workstation).
- A current Vectron POS system, including the software upgrades (Vectron license subject to charge).

The system can be expanded as desired by integrating additional cameras, cash registers and MxMC workstations. End customers interested in the solution receive support from both the MOBOTIX partner network and Vectron, although Vectron partners only handle the software upgrade for Vectron POS systems. Vectron informs its own partners and customers about the joint POS solution developed with MOBOTIX; for example, by distributing a jointly designed flyer. The flyer can be downloaded free of charge from the MOBOTIX website (www.mobotix.com > [Support](#) > [Download Center](#) > [Documentation](#) > [Brochures & Guides](#)). Only a German version is available at present.

Buying And Activating An MxMC POS License

The sale of an unlimited number of POS licenses or activation IDs for the MxManagementCenter (version 1.7 or later) is conducted through the same sales channel as for the sale of a MOBOTIX camera. The MOBOTIX partner responsible for the end customer can send a MOBOTIX MxMC POS license directly to the end customer via e-mail using the MOBOTIX license portal. It's also possible for partners or end customers to stockpile multiple licenses, because the licenses have no expiration date and the time limit for a demo license doesn't apply until the license is activated in MxMC (by selecting Window > Licenses from the main menu in MxMC).

Detailed **operating manuals for the license portal** that are tailored to the status of the partner can be found on the MOBOTIX website at the following link (the link can also be found in the secure partner area):

<https://www.mobotix.com/en/support/download-center/software-downloads/license-portal>

MxManagementCenter Download And Release Notes:

mobotix.com > [Support](#) > [Download Center](#) > [Software Downloads](#) > [MxManagementCenter](#)

3. System Requirements

Requirements For MOBOTIX Cameras:

- MOBOTIX cameras in the Mx6 series (x16/x26)
- MOBOTIX camera software for MX system release 5.0.2.14 or later
- SD card must contain event partitioning
- No license required
- System time must be synchronized (time server)

Requirements For Vectron POS Systems:

- Vectron POS Touch 10 and 15 models tested by us
 - POS Touch 15 II, POS Touch 12 II, POS Vario II, POS Mini II
 - POS Mobile Pro (technically possible, but the cash register is mobile and not fixed in one place; this might not be possible to monitor)
- Vectron SW version 6.1.2.0 or later
- Vectron license package (contains a license for data export for camera transaction storage and a license for displaying the booking data in the camera image and for transmitting the data to the camera for evaluation)
- **Note: In this document, the Vectron license package is only referred to as the Vectron license.**
- System time must be synchronized (time server)



Requirements For The MxMC Video Management Software:

- MxMC version 1.7 or later
- MOBOTIX POS license (license for video evaluation)
- PC operating system: Windows 8 or later/Mac OS 10.9 or later
- System time must be synchronized with cameras (time server available and activated)

4. System Restrictions

For MOBOTIX Cameras:

- Up to seven Vectron POS systems can be assigned to each individual MOBOTIX camera (transaction data is stored in the camera's database).
- Typically, a MOBOTIX camera can cover two cash registers (depending on the physical distance between the cash registers and the details that the camera is meant to capture).
- Storage requirements for transaction data:
 - 4 GB SD card can store up to one million items of transaction data (128 MB reserved)
 - Larger SD cards are required for up to two million items of transaction data (256 MB reserved)
- POS transaction data is only stored on the camera's SD card (encrypted shortcut)

For Vectron POS Systems:

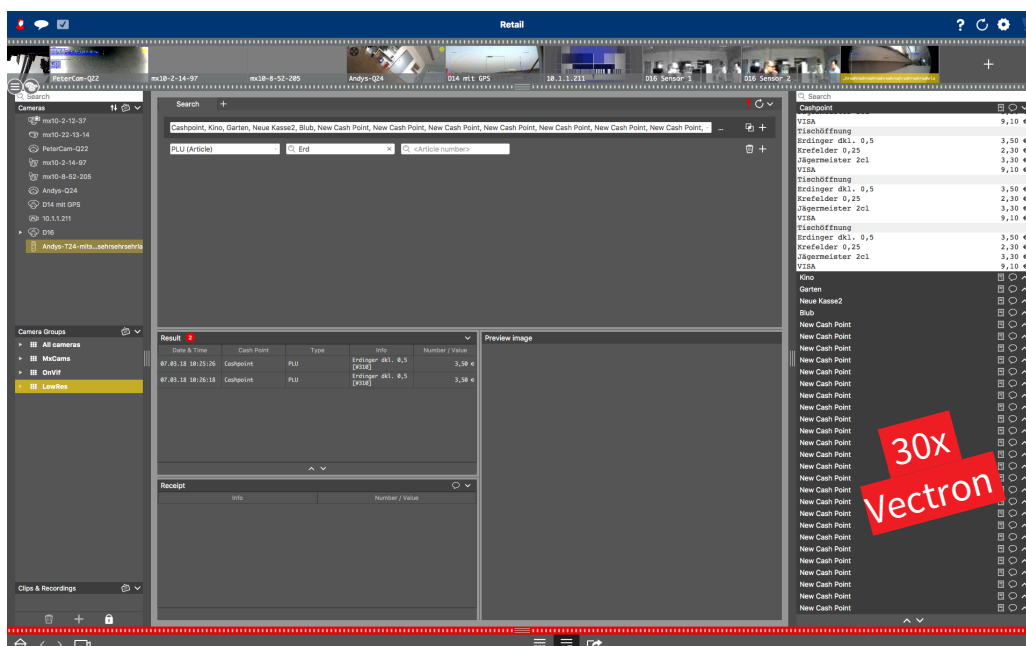
- Only one MOBOTIX camera for transaction reference images can be assigned to each individual Vectron POS system (however, this can be a dual-lens camera such as the S16D, which can display two separate sensor images/views in a dual image, i.e., the view in front of and behind the cash register).
- Only "high-end" Vectron brand POS systems are supported (no "low-end" brand POS systems such as Duratec or BonVi).
- Vectron partners can request demo licenses for the Vectron POS systems.

For MxManagementCenter:

The maximum number of cash registers that can be displayed depends on various factors at the respective site of application:

- Volume of transaction data (bookings)
- Graphical display option at each MxMC workstation (maintain clear overview and user-friendliness)
- Operating mode (checking change on-site/centralized evaluation for all locations)

The benchmark is a maximum of 30 Vectron POS systems per MxMC workstation. The statistical basis for this is 2,000 transactions per day, which corresponds to one new booking/transaction every 14 seconds on average for a period of eight hours.



Typical Application Scenario At A Location/POS: Checking Change

MxMC is used directly at the cash register to check change for the customer. Only one or a few cash registers are integrated into the MxMC workstation. The focus of the application lies on the live ticker of the transaction data in the Retail Bar (sidebar at the right) and the direct linking of each booking with the reference image recorded by the cash register camera.

Please note:

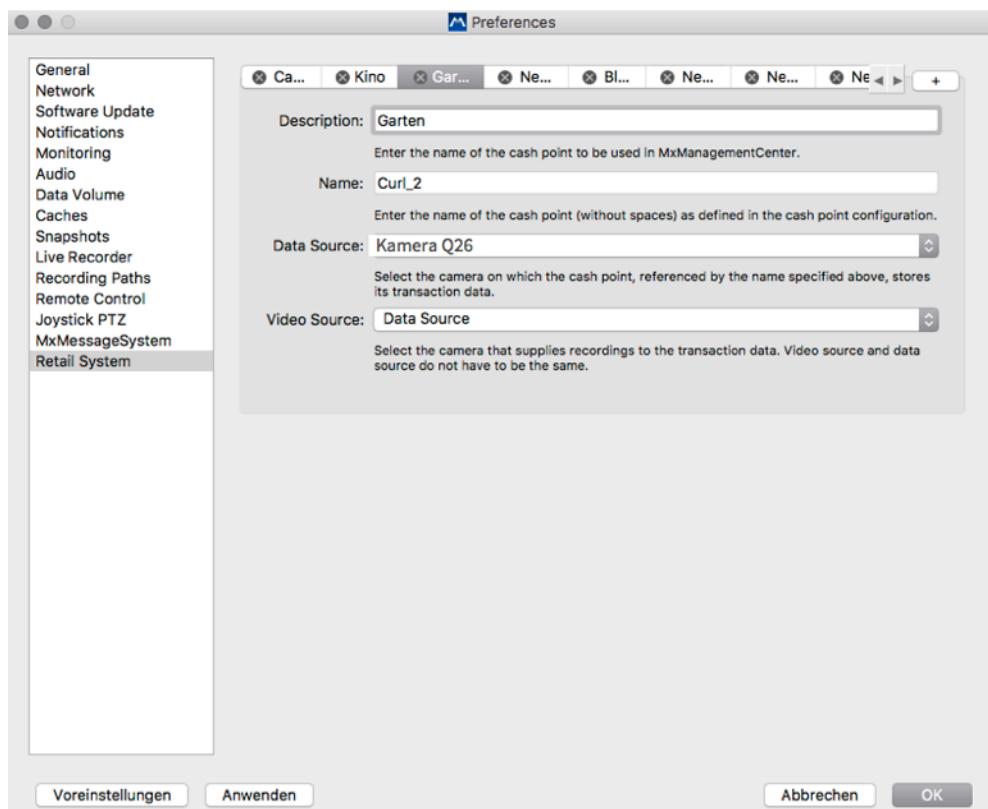
- MxMC supports up to approx. 20,000 transaction data in the Retail Bar; more is technically possible, but this could have a negative impact on the response behavior in the sidebar.
- In full-screen mode (monitor resolution: 1920 x 1080), the Retail Bars of up to 30 cash registers can be displayed at a single MxMC workstation.

Typical Application Scenario For Headquarters: Central Data Evaluation

MxMC is connected with all cash registers at all locations, and the user would like to review processes at several cash registers retrospectively. Here, the focus of the application lies on the large Retail View in the center, and not on the Retail Bar at the right.

Please note:

- In the Retail View, MxMC typically supports up to approx. 100,000 transaction data on the results page; more is possible, but this could have a negative impact on the response behavior.
- In the Retail View, MxMC typically supports up to 30 cash registers (more is possible, but then the “Tabs” list gets longer).
- Search combinations (such as the item “soda” and the price “€4.99”) always only refer to the entire booking lines/transactions (no searching across lines, such as “soda” in line x and “€4.99” in line y)!
- In the event of a very large number of transactions: The Retail Bar with the live transactions (checking change) should remain “retracted” for performance reasons in order to avoid the unnecessary use of processing power.



5. Initial Operation

In order to connect and record the POS data, the following must be configured:

- MOBOTIX camera(s)
- Vectron POS system(s)
- MxManagementCenter

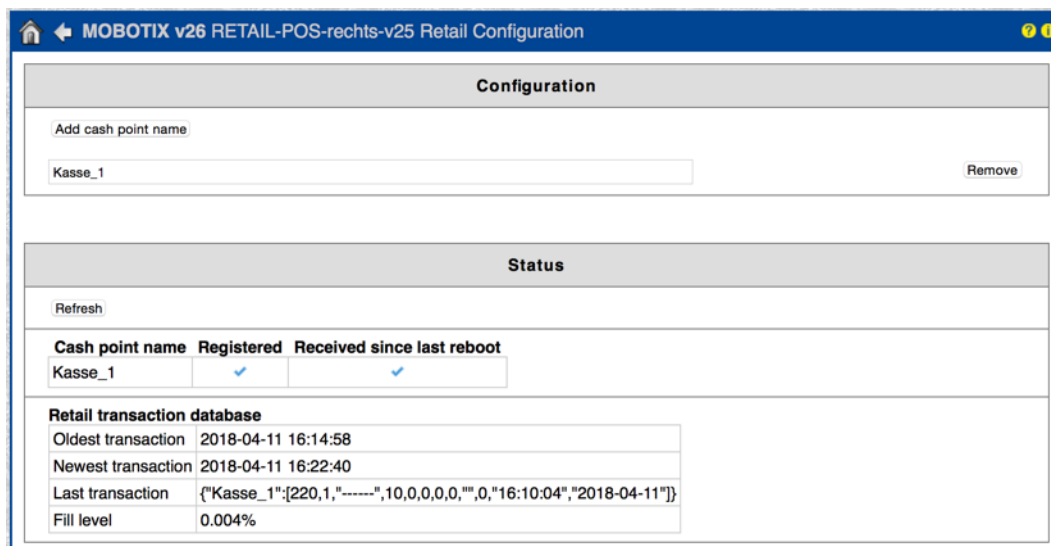
Prior to configuration of the system, the above prerequisites must be fulfilled (for example, POS function in MxMC correctly activated with a license key, corresponding Vectron POS system software installed). It is crucial that the system times for all of the involved devices (camera, PC with MxMC, cash register) are synchronized with an NTP time server (for example, use **MX-GPS-Box** or an NTP time server from the Internet). Then configure the system using the steps outlined below.

Step 1: Configuring The MOBOTIX Camera

In order for the camera to be configured, the corresponding camera firmware must be installed, and the camera must be connected with the Vectron POS system via TCP/IP (ideally, in the same network). No license is required for the camera apart from this. It's important for the **SD card** to already contain **event database partitioning**; otherwise, this needs to be executed first (in the camera's Admin menu). The camera's system time should relate to an **NTP time server**. There are four key menus for the POS solution that now need to be further configured in the camera. Please note that every change made with the "Set" and "Close" key combination will be permanently saved in the camera.

Retail Configuration (In The Admin Menu):

First, a cash register needs to be added to this menu (click the "Add cash point name" button). In the empty field, the SAME name must be entered as is entered in the "Name" field in the MxMC settings.



Configuration	
Add cash point name	
Kasse_1	Remove

Status	
Refresh	
Cash point name	Registered
Kasse_1	✓

Retail transaction database	
Oldest transaction	2018-04-11 16:14:58
Newest transaction	2018-04-11 16:22:40
Last transaction	{"Kasse_1": [220, 1, "-----", 10, 0, 0, 0, 0, 0, 0, "16:10:04", "2018-04-11"]}
Fill level	0.004%

Network Distribution Of Messages (In The Admin Menu):

The “Networking” field must be set to “Enabled.” The “Password” (default: meinsm) and “Broadcast” (default: 19800) fields do not necessarily need to be changed; however, doing so is highly recommended.

The screenshot shows the 'General Configuration of MxMessageSystem Networking' window. It includes fields for 'Networking' (set to 'Enabled'), 'Password' (set to 'meinsm'), and 'Broadcast Port' (set to '19800'). A note at the bottom states: 'Note: Ensure that all network devices are synchronized using a network time server (NTP).' Buttons for 'Set', 'Factory', 'Restore', 'Close', and 'More' are at the bottom.

General Event Settings:

The camera’s arming is deactivated in the factory settings. To activate these, the “Arming” field must now be set to “Enabled.”

The screenshot shows the 'General Event Settings' window. It has a table with three columns: 'Activity', 'Value', and 'Explanation'. The 'Arming' activity is set to 'Enabled'. The explanation for 'Arming' states: 'Arming: Arming for Recording and Action Groups: Enabled: activate all. Off: deactivate all. SI: arming controlled by signal input. CS: arming controlled by custom signal as defined below. From Master: copies Main Event Arming state from master camera.'

Event Overview:

A new MxMessageSystem profile must be created in the “Message Events” area. Before doing this, set “Event Sensor Type” to “MxMessageSystem.” The “Message Name” field must correspond to the name of the cash register; in this example, this is “Kasse_1” (the corresponding entries made in the Vectron POS system and in MxManagementCenter must be identical). The “Message Range” field must be set to “Global.”

The screenshot shows the 'Message Events' configuration window. It includes a table with 'Attribute', 'Value', and 'Explanation' columns. The 'IP Receive' attribute is set to '8000'. The 'Event Dead Time' is set to '2'. The 'Event Sensor Type' is set to 'MxMessageSystem'. The 'Message Name' is set to 'Kasse_1' and the 'Message Range' is set to 'Global'. The explanation for 'Message Range' states: 'There are two different ranges of message distribution: Global: across all cameras within the current LAN. Local: camera internal.'

Recording:

Recording must be set to “Enabled” using the “Arming” toggle. “Event Recording” is recommended as the recording mode. The “Continuous Recording” mode also works from a technical perspective, but this would unnecessarily fill up the recording memory with unrequired data. The goal is to only record when transactions are actually taking place at the cash register. The corresponding MxMessages for the connected cash registers – such as Kasse 1, Kasse 2 etc. – are selected as the triggering event in the “Start Recording” drop-down list.

General Settings	Value	Explanation
Arming	Enabled	Arm Recording: Controls camera recording. <i>Enabled:</i> activate recording. <i>Off:</i> deactivate recording. <i>SI:</i> recording armed by signal input. <i>CS:</i> recording armed by custom signal as defined in General Event Settings . <i>From Master:</i> copies recording arming state from master camera.
	(No time table)	Time Table Profile: Time table profile for time-controlled recording (Time Tables).
Digital Signing	Off	Digital Signing: Digitally sign the recorded image files using the X.509 certificate of the web server. Manage X.509 certificates of the web server .
Recording Status Symbol	On	Activate Recording Status Symbol: On will draw a symbol in the image to visualize the current arming and recording status.
Terminate Recording (TR)	Off	Activate Terminate Recording: Terminate recording if an event is detected. Use this option to freeze stored images. Click here to resume recording.
Storage Settings	Value	Explanation
Recording (REC)	Event Recording	Recording Mode: Type of event and story recording. <i>Snap Shot Recording:</i> stores single JPEG pictures. <i>Event Recording:</i> stores stream files for every event using MxPEG codec. <i>Continuous Recording:</i> continuously streams video data to stream files using MxPEG codec. Events can be recorded with a higher frame rate using <i>Start Recording</i> , <i>Retrigger Recording</i> and <i>Stop Recording</i> .
	Off	Record Audio Data: Store audio data in stream file if available. Enable and configure microphone .
Start Recording	(select all) (select none) Message: Kasse1 Message: Kasse2 Max fps 5 30 s	Start Recording: Select the events which will start recording. Use [Ctrl]-Click to select more than one event. Events in parentheses need to be <i>activated</i> first. Event Frame Rate: Recording speed if an event is detected, in frames per second. Recording Time Before Event: Additional recording time before an event in seconds. Recording Time: Time to include in recorded stream after an event has occurred.

Step 2: Configuring The Vectron POS System

This configuration should be carried out by a Vectron specialist partner. Vectron provides corresponding instructions for its specialist partners on their partner portal.

When configuring the Vectron POS system, it is important to note, among other things, the selected settings for:

- **Cash register name:** Needs to correspond with the cash register name entered in MxMC and the MxMessage name of the cash register camera; if there are spaces in the name, an underscore must be used instead of the space when entering the name in the camera and MxMC; for example, Kasse 1 becomes Kasse_1.
- **Camera IP**
- **Camera user and password**

Step 3: Configuring MxManagementCenter

In order for MxManagementCenter to be configured, the corresponding camera needs to already be integrated into MxMC (live image can be displayed). If the POS license has not yet been activated in MxMC (one license is required per POS), neither the Retail View nor the “Retail System” submenu item can be displayed in the settings (can be found under the first item, “MxManagementCenter,” in the menu bar at the upper left). The actual configuration is quickly handled in the “Retail System” dialog window using four settings. It is important to write the name in the SAME way in the “Name” field. This name needs to correspond to the camera entry for the MxMessage name in order to guarantee that recordings can be clearly matched with the corresponding transactions.

- **“Description” Field**

Enter the designation/location description of the cash register as it will be later displayed in MxMC here; often designated the same as in the field below (here, “Kasse_1”).

- **“Name” Field**

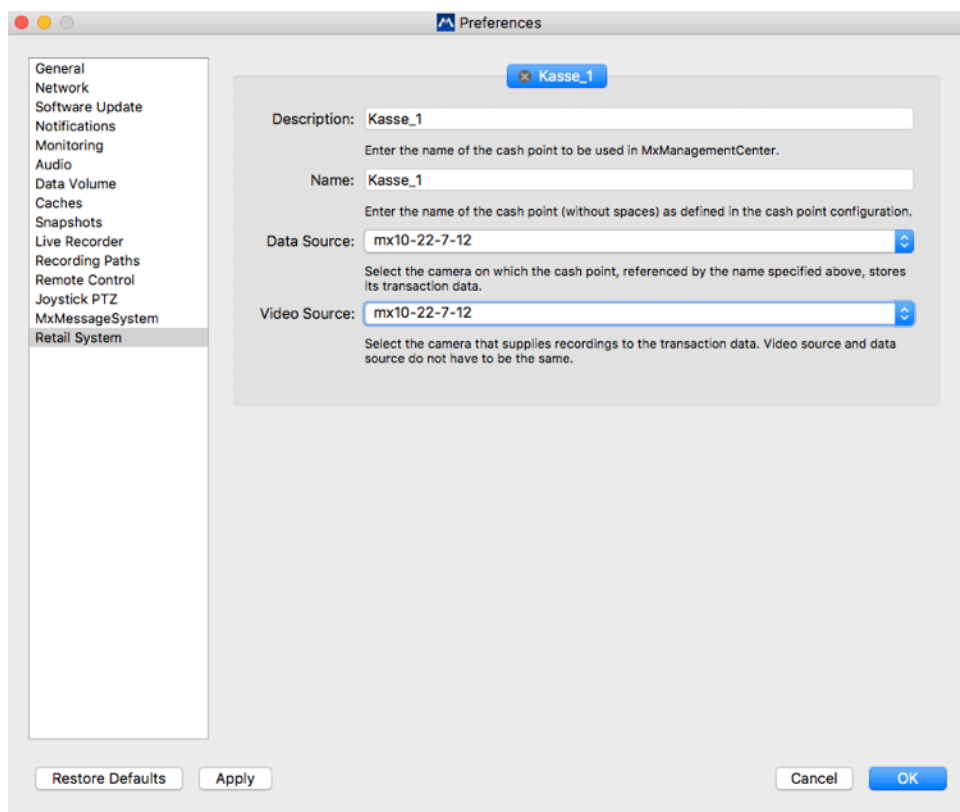
This entry must be identical to the camera entry (here, “Kasse_1”).

- **“Data Source” Field**

Select the camera that will also be entered in the Vectron POS system (camera that saves the cash register’s transaction data).

- **“Video Source” Field**

Usually, the “Data Source” camera is also used as a video source. Selecting another camera would only make sense if the camera with the saved transaction data would not record the area around the cash register. In this case, the camera aimed at the cash register would be selected as the video source.



6. Case Studies

Example 1: “Mom-And-Pop” Store

This scenario concerns a small business with a single owner. The store is usually completely covered by a single camera, and one cash register is used (bookstore, bakery etc.).

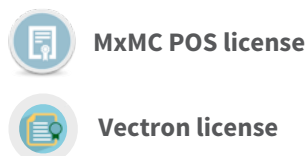
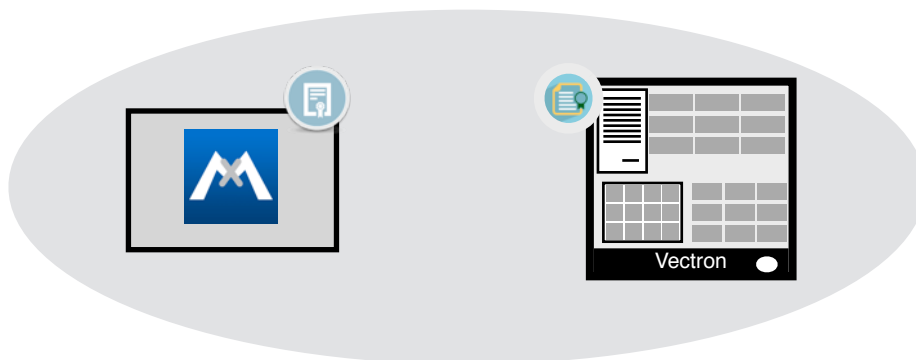
Evaluation is carried out in a local network on-site in the store, as well as externally from the owner’s home. The most cost-efficient solution here is to install MxMC with the required POS license on the owner’s notebook.

License calculation:

Number of MxMC units	Number of Vectron POS systems		MxMC POS licenses
1	1	required	1

Number of Vectron POS systems		Vectron licenses
1	required	1

In this case, only **one** POS license for the MxManagementCenter on the notebook and **one** Vectron license for the cash register are required.



Example 2: Fast Food Restaurant At A Ski Resort

This scenario concerns a fast food restaurant with four cash registers and two to four cameras. Ideally, one camera could record two cash registers with all the required details, and therefore two cash registers could be cost-effectively assigned to a single camera. It's conceivable to have one MxMC workstation set up to collect video evidence at each cash register so that, in the event of disagreements about change, the cashier could immediately review the most recent transactions. During the day, the restaurant owner monitors all cash registers in the restaurant's local network using their notebook, and does this from home in the evenings.

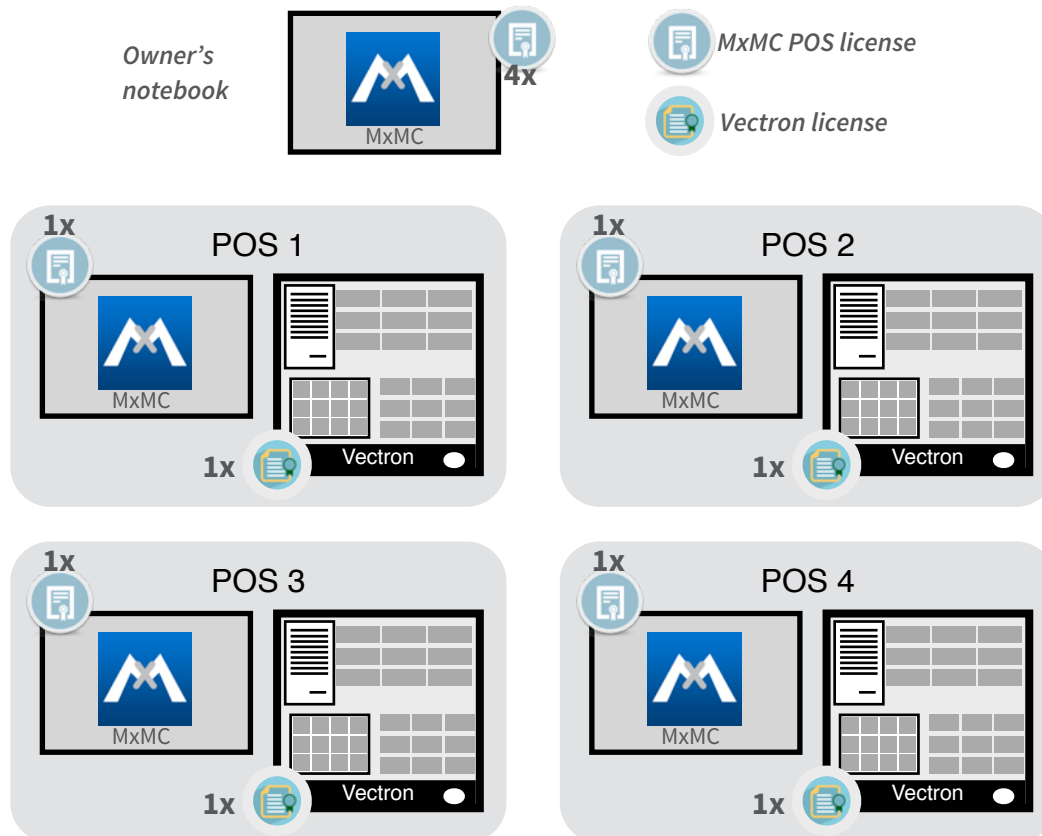
License calculation:

Number of MxMC units	Number of Vectron POS systems		MxMC POS licenses
5	4	required	$1+1+1+1+4 = 8^*$

Number of Vectron POS systems		Vectron licenses
4	required	4

*Only the owner's notebook has access to all four cash registers. The four MxMC workstations at the cash registers on-site each require only one POS license.

In this case, eight **POS licenses** will be required for the MxManagementCenter units, as well as **four Vectron licenses** for the cash registers:



Example 3: Small Delicatessen Chain With Three Locations

This scenario concerns several individual stores that each have four cash registers. The transaction data is evaluated by the local manager in each location as well as by the owner of the delicatessen chain from a superordinate centralized location. Each cash register requires a separate camera in order to record the cash register procedures in great detail, which is why only one camera is ever attached to each cash register. There are three locations in total. Each of the three local location managers, plus the owner, uses MxMC on a notebook to minimize licensing costs yet still be able to carry out evaluations locally and from home. The managers only evaluate the cash registers at their own locations, but the owner evaluates all cash registers at all locations. The Retail Bar for quickly checking change in everyday transactions on-site is typically hidden on the owner's MxMC workstation.

License calculation:

Number of MxMC units	Number of Vectron POS systems		MxMC POS licenses
4	12	required	$4+4+4+12 = 24^*$

Number of Vectron POS systems		Vectron licenses
12	required	12

*Only the owner's notebook has access to all 12 Vectron cash registers (4x3: four per location, three locations). Each of the three managers only has access to the four cash registers in their respective location.

In this case, 24 **POS licenses** (12 for the managers + 12 for the owner) are required for the MxManagementCenter units, plus **12 Vectron licenses** for the 12 Vectron cashregisters:

