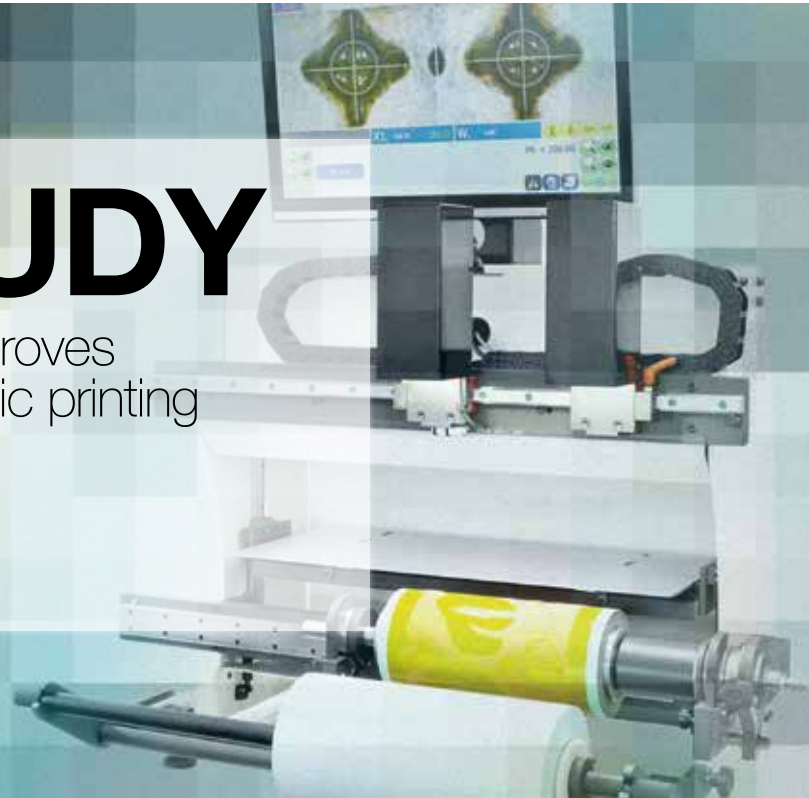


# CASE STUDY

Digital camera surveillance improves precise mounting in flexographic printing



The camera acquisition system „made by FRAMOS“ provides complete control of the zoom and focus of each Sony block camera with only a single cable connection and the power supply at the same wire.

## CASE KEY FACTS

**CUSTOMER** | Leading Italian manufacturer of flexographic printing and mounting machines

**CHALLENGE** | Modernize the imaging-based analog mounting surveillance system to create a more precise and fully controllable digital solution based on high-speed and high-resolution industry cameras

**RESULT** | Thanks to a fully controllable digital imaging system built by FRAMOS, an Italian manufacturer of flexographic mounting machines now achieves a faster, more precise mounting process with a higher resolution and incremented zoom factor, all in a tailor-made housing.

The new systems had to meet four main requirements to increase the system performance: high speed and high resolution, full control over lenses and zoom, overlook a large field of interest from multiple points of view as well as flexibility and affordability.

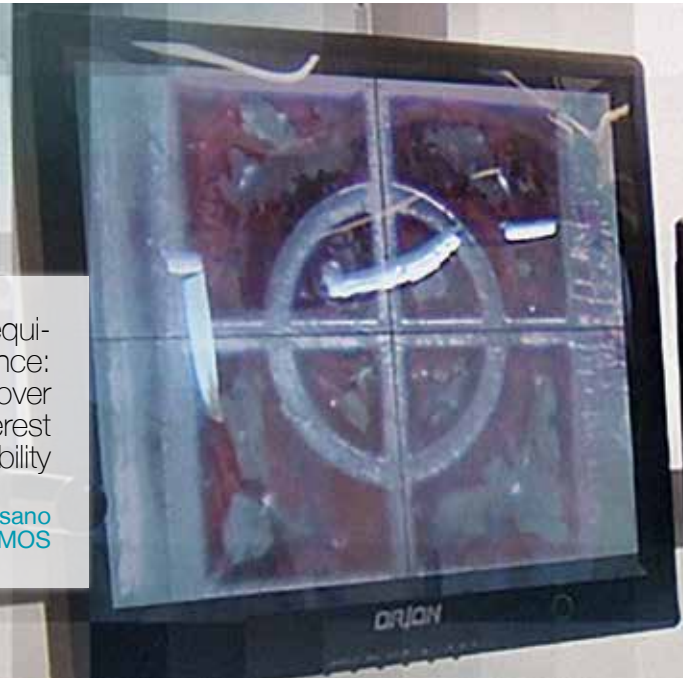
**Digital, High-Speed and Under Full Control: High-precise Mounting of flexographic printing plates with Imaging-based Surveillance** | Flexographic presses are giant printing machines which are superb at delivering high-end graphics printed at rapid speed and low cost. The roll-rotary printing process with up to ten cylinders for all colour shades uses flexible printing plates made from photopolymer or rubber, as well as low-viscosity ink. As a high-pressure process, the raised areas of the printing plate are image supporting whilst the printing unit structure is simple and the intaglio printing process is similar. Flexographic printing provides diverse application areas. Capable of completing large orders very quickly, flexographic presses can print on almost every material including paper, film and metal foils, which are prohibited or restricted in other printing processes.

# CASE STUDY

## Precise mounting with digital surveillance

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Lorenzo Cassano  
Head of business unit CAMERA+ at FRAMOS

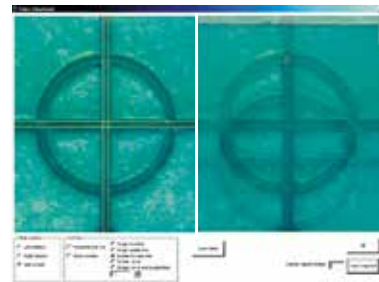


The main application is the printing of packaging materials made from plastics, paper and cardboard. Other possible uses include adhesive films, insulating paper, beverage containers, napkins, carbon copies, wallpaper and latex balloons. Flexographic presses are web fed, which means they are continuously fed from large rolls of materials stock. This allows printing at an average speed of 350 ft per minute, which corresponds to four miles of material an hour.

With such high speed and large amount of different printing steps, one crucial step is the perfect mounting of the printing plates or clichés on the cylinder. To guarantee form stability, high true running accuracy and productivity without machine downtimes, flexoprint mounting machines provide an integrated, camera based surveillance system to overlook, monitor and adjust the cliché mounting based on reference points such as microdots or crosses. The vision-based application manages the registered alignment of the markers on flexographic and rotary printing cylinders to ensure quality and high precision during the printing process.

To update their mounting machines to state-of-the-art technical standards with the highest resolution and speed possible, for an Italian manufacturer it was time to replace the old surveillance systems, which still used an analogue connection and offered poor resolution. For the integration of a modern machine vision solution into its flexographic mounting machines and to present cutting-edge solutions beyond competition, the company approached the imaging specialist FRAMOS for support. Already a customer for analogue frame grabbers, the company asked FRAMOS to provide the full acquisition platform starting from the camera to the host PC including engineering consulting and customisation to set up the solution. The goal was to update one type of device, with the aim of modernising the complete mounting machine portfolio in future.

For the engineers and developers, the new systems had to meet four main requirements to increase the system performance. First and most important was the need for high speed and high resolution, as well as a camera providing a high megapixel count and a high frame rate. To transmit the high data volumes generated without latency, it was also necessary to choose fast digital interfaces based on special specifications to fully control the camera. The second important need was to overlook a large field of interest from multiple points of view and to have full control to work with high-quality optical zooming from different distances. Thirdly, the solution had to be flexible in terms of adjusting focus and zoom factor and, fourthly, had to be available at an affordable price.



Camera-based adjustment and calibration of reference micro dots



SONY FCB-EV7500 block camera and a 2.4-MP Sony Exmor CMOS image sensor with 30x optical zoom auto-focus zoom lens

Based on their long-term experience from sensor to system and the broad imaging portfolio, FRAMOS had chosen the Sony FCB-EV7500 block camera. Running a fast 2.4-MP Sony Exmor CMOS image sensor and a 30x optical zoom auto-focus zoom lens, it delivers the high image quality needed in full HD and offers a wide dynamic range. The corresponding external frame grabber, the Pleora iPORT SB-GigE OEM kit, transforms the Sony camera into a GigE Vision camera. The interface is able to control the camera over a digital channel and to transmit full-resolution video at the maximum rate supported with low, predictable latency over a GigE link and GigE cable. The Tattile industrial PC M110 can run up to six cameras for multiple points of view, each one powered through Power over Ethernet (PoE), having a completely dedicated power channel for all the PoE devices. This way it is possible to have complete control of the zoom and focus of each Sony block camera with only a single cable connection.

The Italian FRAMOS team, based in the outback of Monza, took the challenge to realise this complex project in a period of only three weeks. Starting with a deep analysis of the requirements and the application parameters and conditions, more than just products had to be chosen. As a value-added distributor, FRAMOS identified the suitable products and built prototypes with customisations and individual adaptations.

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The FRAMOS engineers provided a custom development of a mechanical enclosure, which also can be anodised in a customer-specific colour. The prototype of the whole system was developed to test the customer specification and to determine whether the product meets the company's needs. After approval, the production, testing and delivery of the complete system were handled based on the customer needs and respecting their full requirements. Cost control and application flexibility have been additional key points in the success of the proposal.

The case in a nutshell: high-resolution and fast machine vision system with camera image streaming and full lens control over a single Ethernet cable (PoE). The system transmits full-resolution images at the maximum rate supported by the block camera, supporting cable distances of up to 100 metres and featuring a low, predictable latency. It comes with a fully customisable mechanical enclosure.

Thanks to the FRAMOS-built Sony Block Camera Acquisition system, the manufacturer of flexographic mounting machines achieved a more performant and more precise alignment with increased resolution and an incremented zoom factor. The solution is currently in use on flexographic mounting and visual inspection machines for printing and components testing and was presented at the world's leading print trade fair, DRUPA 2016.

# WE ENABLE IMAGING

About FRAMOS



Lorenzo Cassano  
Head of CAMERA+ at FRAMOS

**ABOUT FRAMOS** | For FRAMOS, image processing is not just a technical discipline, but a fascination, the future and our mission all at the same time. Since 1981 FRAMOS is a leading technology provider in industrial, scientific and medical image processing. Headquartered in Munich and with 5 subsidiaries worldwide we enable manufacturers, system integrators and researchers to benefit from imaging technologies. Our team of approximately 80 associates offers a fully comprehensive portfolio of imaging components, technical consulting and support. Thanks to many years of experience in the industry, we offer engineering services for custom camera development as well as complete turn-key-solutions. We are proud of our participation in a revolutionary technology. The spirit of innovation and development of our early days has remained at the heart of our company.

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