PERFECT PRINTS WITH LP2200

OMET has decided to rely on ASEM's LP2200 Panel PAC for the realization of iFlex and XFlex, the label printing machines designed to revolutionize flexographic printing.

The Challenge

Flexography has become one of the most versatile printing technologies on the market capable of offering high quality and extreme flexibility on substrates and in a mix with other technologies. Flexo is particularly suitable to print high-coverage, special, metallic colors, texts, and varnishes offering a wide color gamut and precision of details. OMET flexo stations can feature either sleeves or cylinders technology and print using UV or UV LED, EB, water-based, or solvent-based inks, in standard or vertical configuration.

SIZE
300+ employees

SECTOR
Packaging Printing

COMPANY
OMET is a Group of 5 manufacturing companies and manufacturing plants in Italy and growing steadily of a 10% in turnover since 2010, a world leader in the production Packaging Printing Machines following the label and packaging market and Tissue Converting Machines, having realized more than 1900 successful projects worldwide since their foundation in 1963.

PRODUCTS
The Packaging Printing business unit's product portfolio includes multi-technology, multi-product, and multi-application modular narrow and mid-range label printing machines for labels and packaging printing, plus complimentary services including ancillary equipment, consultancy, and accurate pre and post-sales service programs.

It is in the field of flexo presses for label printing that OMET needed to identify a new solution for the automation of the system, to replace the existing classic one based on modular PLC and operator panel, which would be technologically up to the level of a cutting-edge product, with compact features for the reduction of the overall dimensions and the maintenance of the size of the electrical panels, as well as being competitive from the cost point of view, which in any case remains an important factor.

Solution with CODESYS-based LP2200 panel PAC

For automation solutions, ASEM offers compact PAC systems capable of incorporating SoftPLC-based control logic, the human-machine interface, and all other service functions in a single device.
ASEM's integrated control solutions scale from ARM platforms with Windows CE operating systems up to high-end x86 systems with Windows operating systems and their real-time extensions.
The scalability of performance is accompanied by the absolute portability of the software developed both HMI and SoftPLC that can be reused across a wide range of products.
For the application of flexographic machines, OMET has chosen a console-mounted ASEM LP2200 system as shown in the image below.
Based on Windows Embedded Standard 7 operating system, thanks to the Intel Celeron J1900 quad-core 2.0GHz processor and 4GB of RAM, with integrated UPS and 512kB MRAM memory for saving retention variables, LP2200 is the ideal solution for applications that require a Panel PAC with good performance at an affordable price.

LP2200, like all ASEM PACs, integrates the bundled CODESYS SoftPLC, compatible with the IEC-61131-3 programming standard, whose previous knowledge has allowed OMET technicians a fast and effective implementation of the machine control logic, being able to take full advantage of the different resources of the platform.
The process logic sequences have been encoded using the SFC language, very powerful for the description of state machines, the Ladder Diagram has been used for the management of events and simple logics, while the Structured Text has allowed describing in the best way the calculation and management parts of the most complex parts of the machine.
The architecture of the control program involves the use of **three types of Fieldbus master**.
The management of the material transport system based on servomotors is managed by a separate controller that interfaces with the control system through the **Modbus TCP** bus managed by the CODESYS project as the first master.
Through this connection, the various parameters necessary for their correct operation are supplied to the drives.

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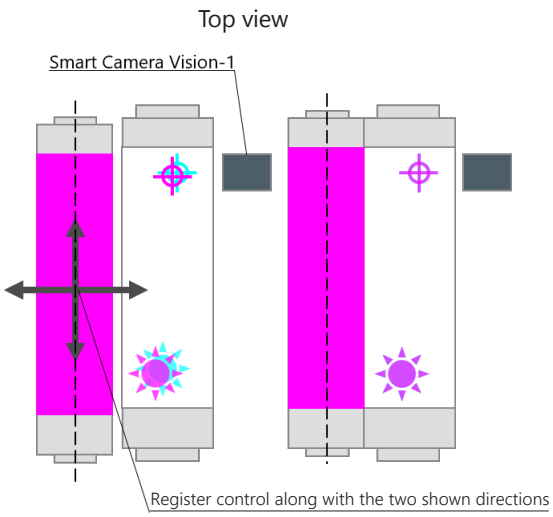
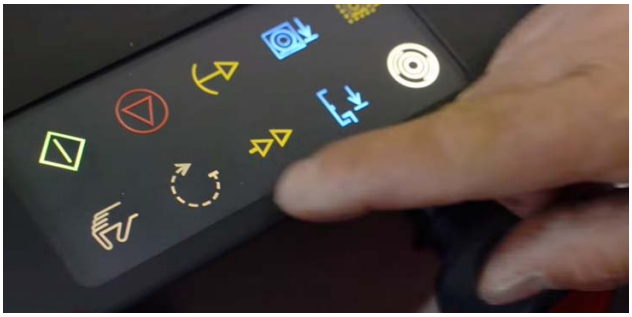
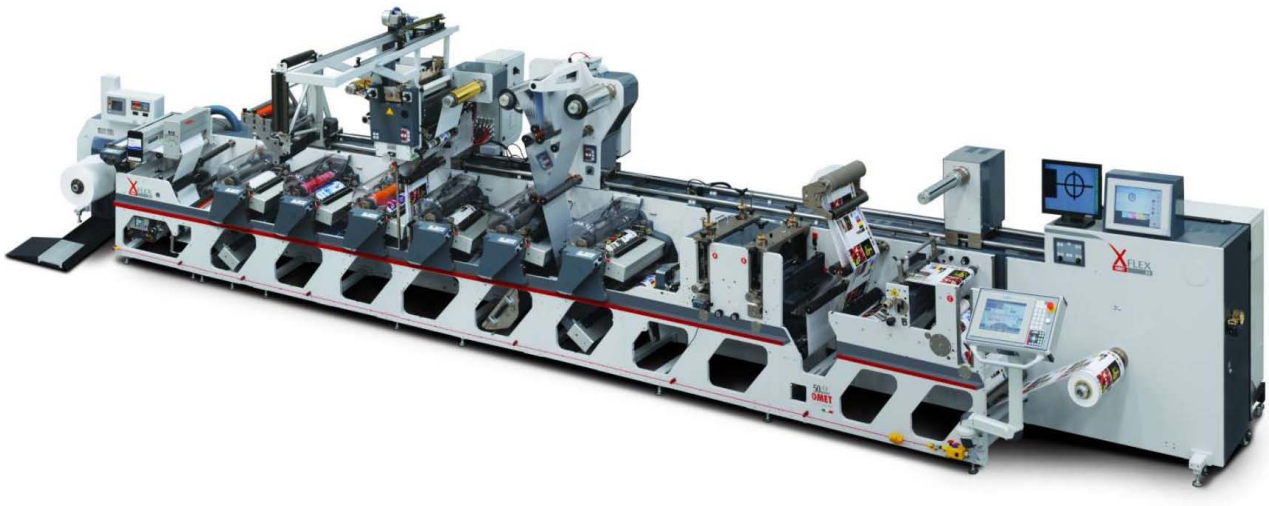
Moreover, thanks to the Modbus TCP bus, it is possible to communicate with the vision systems mounted on the machine. In the case of the iFlex machines, the iVision system, thanks to a series of Smart Cameras, one on each flexo unit, allows high-speed images of the printing material to be detected, allowing the operator to adjust the cylinders manually for the correct overlapping of the register marks and therefore the colors on the print.
In the case of the XFlex X4 and XFlex X5 printing machines, on the other hand, the Vision-1 automatic system radically reduces set-up times and waste during start-up, guaranteeing the optimization of productivity and exceptional quality results on any material, thanks to an automatic register control system that uses servomotors with integrated drives to control the printing registers, driven by the CODESYS project through the **CANopen** bus and specially created Motion libraries.
For each printing group, it is, therefore, possible, according to the input coming from the camera located at the bottom of the machine, to automatically adjust the advancement of the registers transversally and longitudinally to the direction of the material flow to align them perfectly using two motors for each of the six registers, for a total of twelve motors and related drives for the entire machine.



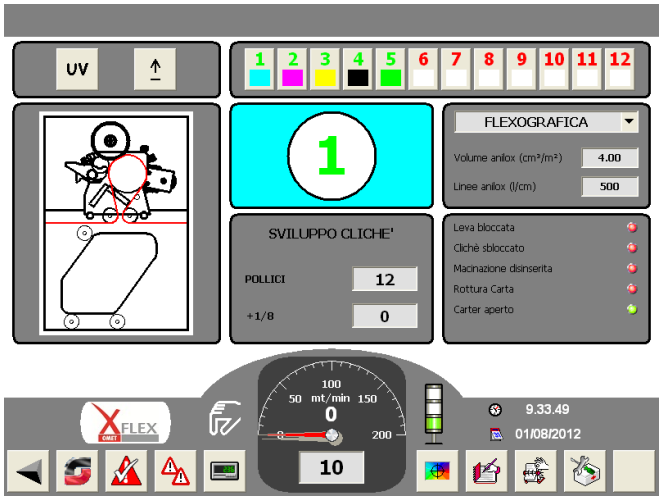


The inputs and outputs are managed by **EtherCAT** bus systems. Thanks to an EtherCAT-ASi gateway realized in CODESYS, the program manages the communication with about one hundred I/O points on the machine such as the ASi pushbuttons present onboard the machine near each printing cylinder that allows their manual management.

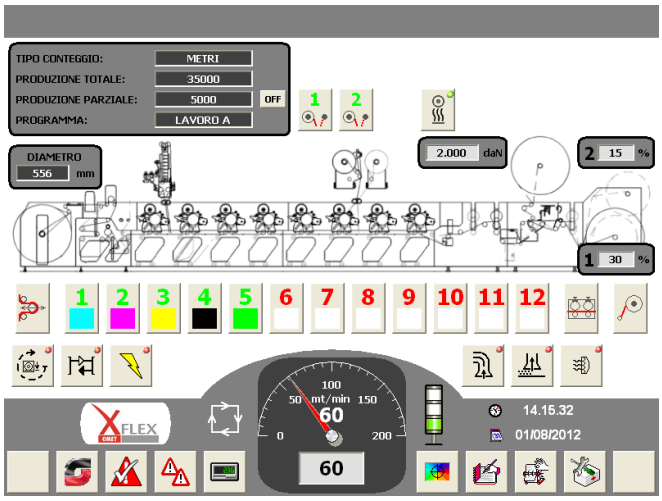


Visualization with Premium HMI

The HMI application is realized with the Premium HMI platform that has allowed OMET's developers to effectively approach the development but above all the maintenance of a very varied series of HMI applications.
The flexibility of the technology used for printing entitles OMET's customers to make very different requests for customization and it is therefore essential to be able to use tools for the development of interfaces that guarantee immediacy and versatility as allowed by the advanced object programming environment of Premium HMI Studio.



The HMI application implements the classic controls that allow the display of the machine **status**, the display of **alarms**, the consultation of the history of **events** that occurred, the management of the various **formats**, settings, and parameterizations.
Particularly interesting for the type of application is the management of the various types of formats through Premium HMI's powerful data archiving tools that use databases for reliable archiving even of considerable amounts of data.



In addition to the Premium HMI functionalities and thanks to the flexibility of the tools provided by the Windows platforms, OMET has added internally developed programs for **data exchange between machines of the same plant for the synchronization of information related to production recipes.**
The same application also supports the creation of **reports** for production monitoring.

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