

*Make it to the max.*

CAMLINE® FMS



Camline Corporation



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# CAMLINE® FMS

## - Maximizing the productivity of a manufacturing system

Camline Corporation is a software company which specializes in designing and producing software and data systems for modern manufacturing and engineering industries. As a software-oriented system integrator, we have concentrated on developing the modular, easy-to-use CAMLINE® FMS control software for the control of a wide range of manufacturing systems - from single machine-pallet management to complete management of a total production facility.

CAMLINE® FMS is based on a cell control concept, with each manufacturing cell being controlled by a process on a cell computer. CAMLINE® FMS systems can include two or more such cell-control processes. Our control concept makes it easy to expand the system - even when it is in operation. In addition, cell functions are easy to control and to re-configure.

Thanks to the visual, user-friendly interface of CAMLINE® FMS, individual manufacturing cells are easy to manage. The whole system layout is displayed on screen - just as it is on the shop floor.

### FLEXIBLE MACHINE TOOL INTEGRATION

Because we are totally independent of machine tool manufacturers, we can supply our customers with whichever hardware is the most appropriate to their needs. In addition, as an open system integrator, we can retrofit CAMLINE® FMS to existing hardware.

Almost any type of machine tool can be integrated with CAMLINE® FMS, e.g. machining centres for prismatic work pieces, turning-centre cells for rotational work pieces, washing machines and robot cells for deburring. There are, however, certain requirements to be met. In order to be able to create an automatic pallet-exchange dialogue with the machine tool controller, the system needs interface signals. Secondly, there must be enough space in the pallet changer, or on the intermediate table, to accommodate the telescopic forks of the stacker crane.

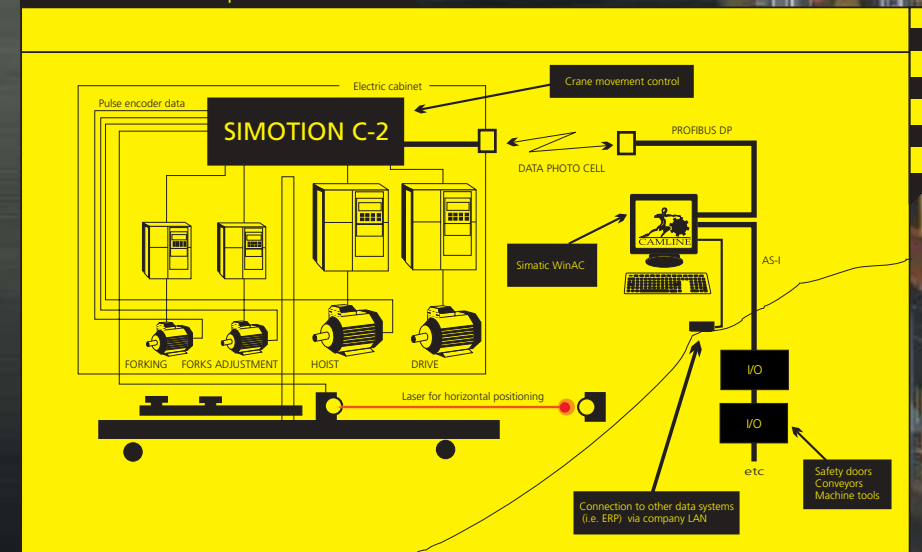
CAMLINE® FMS uses the latest technology to communicate with the machine tools, e.g., Ethernet- and HSSB communication.

### ADJUSTABLE STACKER CRANE

The CAMLINE® FMS stacker crane is based on a standard automatic stacker crane designed to handle material pallets. However, the CAMLINE® FMS stacker crane can be equipped with adjustable forks which enable it to handle machining and material pallets of different sizes simultaneously. This also makes it possible to integrate machine tools of different sizes and makes in a single system. The crane is also equipped with a drop-plate for coolant collection, and with special add-ons to prevent the machining pallet from moving on the forks during transportation.

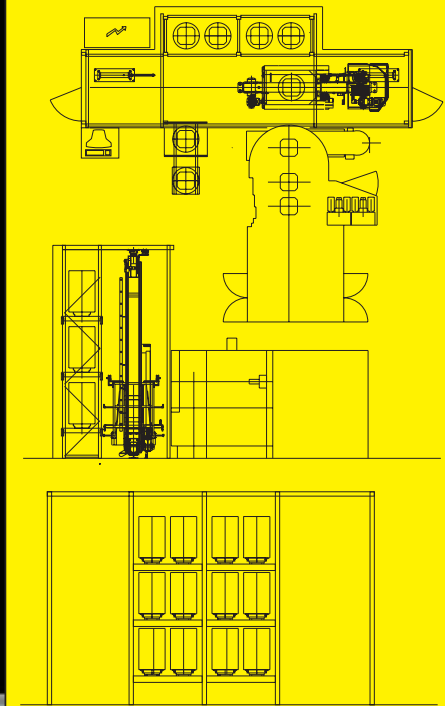
The crane controller is assembled from off-the-shelf components available throughout the world. This ensures simple maintenance.

### CAMLINE® CRANE concept



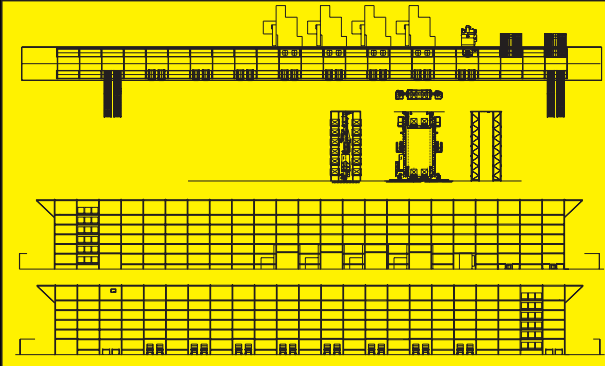
## Mansner

- System length 3,6 m, height 4,9 m
- Camline stacker crane
- Kitamura machine tool with Fanuc 16Mi controller, HSSB communication
- 12 places for 400x400 mm machine pallets
- Max load 700 kg (including pallet)



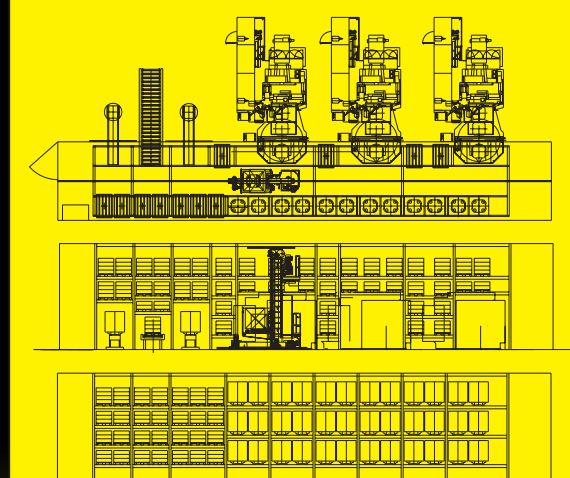
## Flextronics

- System length 65,5 m, height 9,0 m
- Material pallets and machine pallets management
- Camline stacker crane
- 4 Mazak machine tools with Mazatrol Fusion controller
- 48 machine pallets
- Machine pallet size 630x630 mm, max load 1500 kg
- Max load dimensions 800x1200x900mm
- 729 EUR-pallets
- Pallet washing machine



## Pemax

- System length 21,3 m, height 5,3 m
- Material pallets and machine pallets management
- Camline stacker crane
- 3 Niigata machine tools, Fanuc 16Mi controller, HSSB communication
- 36 Machine pallets
- Machine pallet size 630x630 mm
- 72 EUR-pallets
- Max load 1500 kg
- Max load dimensions 800x1200x900 mm



## PRACTICAL PALLET STORAGE

The pallet store is built from standard racking components. Additional beams are fitted under the machine pallet positions to support different designs of pallet base. Sheet metal trays are fitted under each machine pallet position to collect coolant and chips, which drop from the pallets. Coolant is directed away from the racking and collected in specially designed tanks.

CAMLIN<sup>®</sup>FMS handles standard size material pallets and virtually any size of machine pallet.

### Standard machine pallet sizes:

400x400(500) mm

500x500(630) mm

630x630(800) mm

800x800(1000) mm

1000x1000 mm and up

Payload on the pallet is typically from 500 kg up to 3500 kg.

### Material pallets:

Standard EUR 800x1200 mm

Standard FIN 1000x1200 mm

or metal containers which height can exceed up to 1200 mm.

## SMART LOADING STATIONS

Machine pallet loading/unloading stations are individually selected for each application. The stations incorporate pallet rotation and either a lifting or tilting pallet table. In the case of two-sided pallet storage, motorized transport is used between the racking area and the operator area. Loading stations can be splash-proof and equipped with a drain for guiding the coolant from the station to the collection tank.

## CHOICE OF MATERIAL HANDLING STATIONS

Material handling stations are used when material pallets for either raw material or finished work pieces are included in the FM system. These stations can be either drawer type stations or roller conveyor in/out stations.



## STANDARD COMPUTER HARDWARE

The CAMLINE<sup>®</sup> FMS control system is designed to use a computer hardware platform based on industry standards, and on PC networks with a Windows operating system. The number of workstations varies, according to operator needs and the functions incorporated in the CAMLINE<sup>®</sup> FMS control system. Each computer on the shop floor stands in a special cabinet designed to protect the PC without impeding its efficient use.

## VARIOUS LEVELS OF SOFTWARE

CAMLIN<sup>®</sup> FMS can be delivered with various levels of software - from single machine-pallet management to complete management of a total production facility. The different levels may be purchased step by step, to add to existing installations, if the customer prefers this approach.

The highest level of CAMLINE<sup>®</sup> FMS is an enterprise-wide integrated manufacturing management system (IMS), which can include the manufacture of complete products as well as parts and sub-assemblies. The management of self-manufactured, subcontracted and bought-in parts can be handled.

With CAMLINE<sup>®</sup> FMS, the management of NC programs with automatic program downloading for machining-pallet exchange is always included. The user interface for this function is CAMLINE<sup>®</sup> WinDNC. CAMLINE<sup>®</sup> ADC can be used to monitor the performance of the machine tools and other automatic equipment connected to the FM-system.

CAMLIN<sup>®</sup> WinTOOL is a software for managing the individual tools used in the machine tools. It manages the cutting times for each tool in each machine pallet/NC program. Stored information can be used proactively, e.g. for tool forecasting and maintenance planning. This is particularly useful when planning tool preparation for unmanned periods of operation.