

WorkShopManager





The future is now!

The manufacture of, for example, a moulding tool involves a number of separate machining operations that together form a coherent process chain. Each of the constituent operations requires data in the form of machining programs, coordinates for workpiece position on the pallet and, if the machine has a pallet changer, details of magazine positions.

A process chain thus embraces a mass of information and it is rare for there to be just one of the chain's operations out in the workshop. Indeed, a number of jobs (each in its own phase of the chain) are normally spread across the entire workshop. Keeping control of all the information and coordinating all the operations is not exactly easy.

WorkShopManager gives you the necessary overall control by:

- administering and providing data (order, drawing and component) in the forms required by each part of the production facility.
- transferring complete, executable machining programs to the machines.

WorkShopManager is a family of programs with associated hardware options. Its various possible combinations and configurations cover each user's specific needs.

Simply put, WorkShopManager's functions are: to manage; to monitor; and, to make sure that nothing goes wrong.

The user-friendly methodology of WorkShopManager comprises three principal steps – preparation, execution and monitoring.

Preparation

WorkCenter, the application that forms the base of the system, handles the preparation of production orders. All the necessary machining data is then saved in a central database with NC programs linked to each operation.

Database information is transferred to machines in different ways. The determining factor is whether or not the machine in question is equipped with...

- ...a robot for automatic changing.
- ...an ID system.

Execution

WorkShopManager has an open structure and thus works with most machine tools – irrespective of machining technology, machine make and machine age.

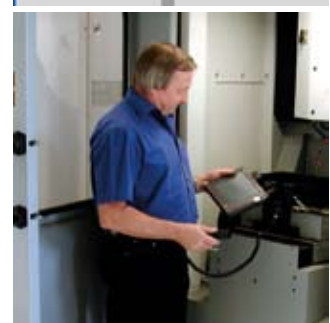
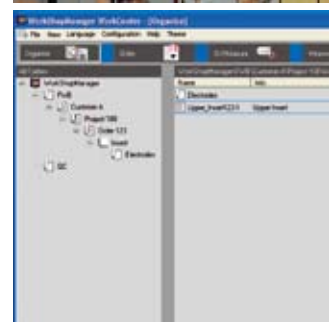
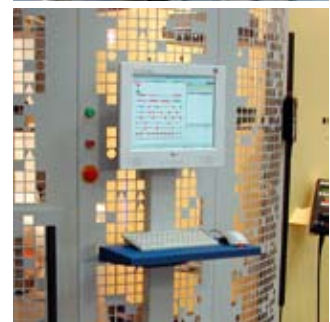
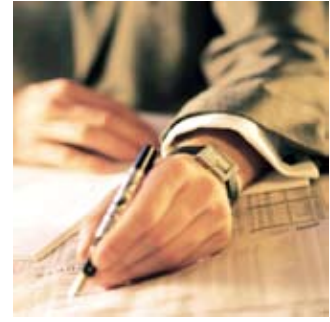
WorkShopManager grows with the work it is confided. Start with a single machine at the lowest level and upgrade as your needs expand. Alternatively, equip several machines and link them together in a process chain.

WorkShopManager is flexible:

- easy to upgrade from one level to the next.
- the initial level of investment provides a basis for any future upgrades.
- in the same workshop, different machines can be at different levels.
- regardless of whether machines are loaded automatically or manually, an efficient methodology is applied throughout operations; results are rapid.

Monitoring

All information is readily accessible in the system. It is simply a question of deciding what to “pick out” and how to communicate and use this information.



PREPARATION

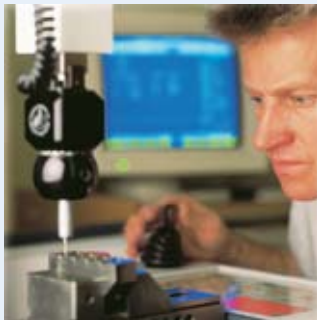
WorkCenter



Operation lists

Production orders are prepared in WorkCenter. Work operations are listed in the correct sequence. NC programs are linked to physical items and individual operations.

Coordinate machine



Identification and measurement

A measuring machine can, if necessary, be used to establish offset values (XYZC) for the workpiece on its pallet before machining.

EXECUTION

Robot loaded machines

CellManagement – online (code carriers required)

CellManagement

Chaotic loading of magazines

After automatic scanning of the magazine, a job list is created in CellManager.

Jobs are carried out in the order given in the job list, one program at a time. The machine is hierarchically below CellManager.



Advantages:

- Job sequences can be altered.
- Magazines can be loaded and unloaded during machining.
- Automatic monitoring.

Batch-Building – offline (code carriers or visual identification)

BatchBuilding with identification

Chaotic loading of magazines

After scanning of the magazine, a master program is created. This contains all the jobs that have been detected. Jobs are carried out in the order given in the master program. The robot is hierarchically below the machine.



BatchBuilding without identification

A loading list for the magazine is created.

Jobs are carried out in the order given in the master program. The robot is slaved to the machine.

MPS & CAD/CAM

EXECUTION

Manually loaded machines

CellManagement – online (code carriers required)

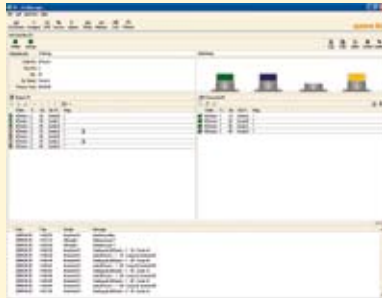
CellManagement

Chaotic loading of machine tables with multiple chucks

After manual scanning of the machine table, a job list is created in CellManager. Jobs are carried out in the order given in the job list, one program at a time.

Advantages:

- Job sequences can be altered.
- Automatic monitoring.



Batch-Building – offline (code carriers or visual identification)

BatchBuilding with identification

Chaotic loading of machine tables with multiple chucks

After manual scanning of the machine table, a master program is created. This contains all the jobs that have been detected. Jobs are carried out in the order given in the master program.



BatchBuilding without identification

A loading list for the machine table with multiple chucks is created.

Jobs are carried out in the order given in the master program.

MONITORING

Monitoring



AlarmServer

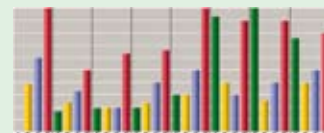
Alarm messages from machines and robots can be transmitted via e-mail or SMS.

Status

WorkCenter keeps control of what is to be machined and in which machine. It also monitors job status.

Reports

Reports, e.g. machining time per piece, can be created and transmitted to a production planning system (PPS).



MPS & CAD/CAM



Base modules

WorkCenter is the base of the system. It prepares production orders.

Can be upgraded with:

- Identification system.
- Communication with a material planning system (MPS).
- CellManager.

Note: WorkCenter is also marketed in machine-adapted versions, e.g. SIGMA.

The jobs created in *WorkCenter* are shown graphically in *CellManager*. For each of a cell's machines, this provides graphics such as magazine configuration and job status. The graphic interface makes it easy for operators to prioritise jobs and monitor cells. *CellManager* also makes it possible to integrate a large number of options:

- Identification system.
- Communication with a material planning system (MPS Export & Import).
- Alarm functions (AlarmServer).
- Automatic electrode selection (AES).
- Cutting tool management (CTM).

Options

WorkShopManager is a family of programs with associated hardware options. Its various possible combinations and configurations (levels) cover each user's specific needs.

Identification system

WorkShopManager requires pallets to be equipped with an identification system. Whether this is visual (e.g. marker tags) or electronic (using inductive readers and ID transponders), *WorkShopManager* ensures process reliability.

For each object, sets of data are stored in the database. The easiest way of handling all this data is to give each pallet and electrode holder a code carrier – an "ID button" in the form of a chip. Reading of the chip (by a reader) can be either automatic or manual. The read identity links up all the data that the database holds for the object.

Communication with a material planning system (MPS Export & Import)

This enables complete production orders to be imported into WorkShopManager from a material planning system. The results can then be exported back.

Components

- A number of MPS tables in WorkShopManager's database.
- An interface program (MPS2WSM).

AlarmServer

Alarm messages from machines and robots can be transmitted via e-mail or SMS. This gives a high degree of freedom.

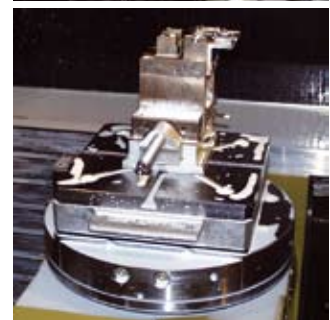
Automatic electrode selection (AES)

Automatically selects the optimum electrode for the operation concerned. It is used to limit the number of electrodes in the processing of identical workpieces. This function requires there to have been an assessment of electrode wear in rough, medium and fine machining.

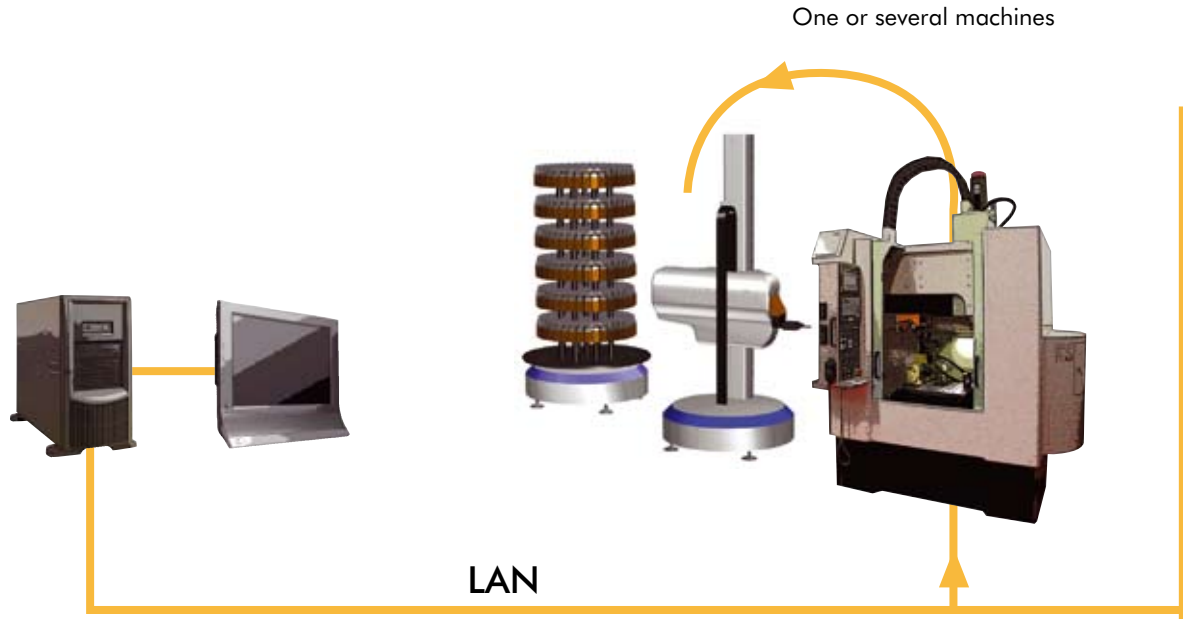
For example, it may be decided to "downgrade" electrodes after an initial stage. Thus, in "job 2", the medium electrode from "job 1" may be used as a rough electrode and the fine electrode as a medium electrode. A new electrode would then be brought in for fine machining.

Cutting tool management (CTM)

Monitors tool cutting times and, consequently, wear. Availability and wear are checked after scanning of the tool magazine. If a tool is missing, or if it is calculated that the life left in a tool is not sufficient for the completion of the job in question, the job is marked as not executable.



LEVEL 1



	WorkCenter	CellManager	ID System	
BatchManagement	X			LEVEL 1
Batch ID	X		X	LEVEL 2
CellManager	X	X	X	LEVEL 3

		WorkCenter	CellManager	ID System	
OPTIONS	MPS Export & Import	X	X		LEVEL 1+2+3
	CTM		X		LEVEL 3
	AES		X		LEVEL 3
	Alarm Server		X		LEVEL 3

- ▶ WorkCenter
- ▶ BatchBuilder – creates a “batch” of the jobs. Lists magazine positions along with a loading list and transfers the batch to machine management.

Option: Communication with a material planning system (MPS Export & Import)

LEVEL 2



	WorkCenter	CellManager	ID System	
BatchManagement	X			LEVEL 1
Batch ID	X		X	LEVEL 2
CellManager	X	X	X	LEVEL 3

		WorkCenter	CellManager	ID System	
OPTIONS	MPS Export & Import	X	X		LEVEL 1+2+3
	CTM		X		LEVEL 3
	AES		X		LEVEL 3
	Alarm Server		X		LEVEL 3

- ▶ WorkCenter
- ▶ BatchBuilder – creates a “batch” of the jobs.
- ▶ Identification system – automatic scanning of magazines and transfer of batches to machine management.

Option: Communication with a material planning system (MPS Export & Import)

LEVEL 3

Single cell or double cell or triple cell



	WorkCenter	CellManager	ID System	
BatchManagement	X			LEVEL 1
Batch ID	X		X	LEVEL 2
CellManager	X	X	X	LEVEL 3

		WorkCenter	CellManager	ID System	
OPTIONS	MPS Export & Import	X	X		LEVEL 1+2+3
	CTM		X		LEVEL 3
	AES		X		LEVEL 3
	Alarm Server		X		LEVEL 3

- ▶ WorkCenter
- ▶ Identification system – automatic scanning of magazines and transfer of batches to machine management.
- ▶ CellManager – administers a complete robot cell – robot plus machine(s). Automatic handling of all necessary data.
- ▶ Machine processor that communicates with the machine(s). Monitors the jobs, handles the results of job execution.

Options: Communication with a material planning system (MPS Export & Import).
 Automatic electrode selection (AES).
 Cutting tool management (CTM).
 AlarmServer.

Note: All programs can always be upgraded.

Advantages of WorkShopManager

- ▶ Rapid and exact overview of the entire production chain.
- ▶ Greater flexibility – priorities can be altered at any time.
- ▶ Necessary data is input quickly and in a structured manner.
- ▶ Easier and more reliable tooling of production cells. The link between workpieces, magazine positions, offset values and NC programs is always made.
- ▶ The risk of errors owing to the human factor is reduced.
- ▶ Generates shorter lead times.
- ▶ Open architecture – can be implemented in machines irrespective of their technology, make and year.
- ▶ You decide the level of investment.
- ▶ Opens up possibilities for automated one-off production.
- ▶ Reliable reports mean more precise post-production calculations and simplified drawing up of quotations.
- ▶ Reduces the demands made on personnel – easier to bring in new staff.
- ▶ Paperless production.
- ▶ Can be linked to a material planning system.
- ▶ Developed by experienced production engineers.

Italian production manager

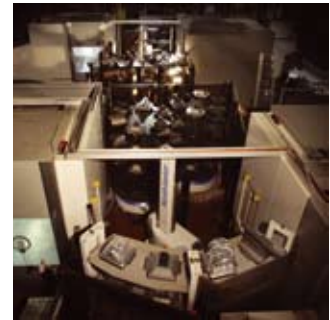
"I'm surprised how easy it was to get started. System 3R has extensive experience of production technology and automation. It willingly shares this experience."

Swiss MD

"I'm almost tempted to say that it was ridiculously easy to implement WorkShopManager."

German production manager

"Structure, handling and the open architecture, which saved us a lot of problems with the interface, were critical in the choice of System 3R for the new automatic cells."



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